



**City of Kansas City, Missouri  
Water Department  
Wes Minder, Director**

# **Project Manual**

**PROJECT/CONTRACT NO. 80001977/9618**

## **PROSPECT ELEVATED WATER STORAGE TANKS**

### **BIDDER/ADDRESS**

<b>Company</b>	_____
<b>Contact</b>	_____
<b>Address</b>	_____
	_____
<b>Phone</b>	_____
<b>Fax</b>	_____
<b>Email</b>	_____

Project Manager: John Reddy  
Telephone: (816) 513-0377  
Email: [John.Reddy@kcmo.org](mailto:John.Reddy@kcmo.org)



## ADDENDUM NUMBER 1

Project Number 8000977/9618

Project Title Prospect Elevated Water Storage Tank

ISSUE DATE: February 09, 2023

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on **February 28, 2023**, are amended as follows:

The Bid date for this Project stated in Document 00130 - Invitation to Bid shall be changed to: **2:00 PM, on March 14, 2023.**

Information to Bidders The following is provided to Bidders for information only:

The Mandatory Pre Bid date and time for this Project has been moved from 2:00 PM, on February 14, 2023 to **3:00 PM February 21, 2023.**

1. Due to the desire to limit the number of individuals in the KC Water building, we would like to communicate the option to attend the Mandatory Pre Bid meeting virtually.

### Microsoft Teams meeting

**Join on your computer, mobile app or room device**

[Click here to join the meeting](#)

Meeting ID: 295 004 849 669

Passcode: srKyZN

[Download Teams](#) | [Join on the web](#)

**Or call in (audio only)**

[+1 872-212-5076,,966303641#](#) United States, Chicago

Phone Conference ID: 966 303 641#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

### Bidding Requirements

1. Add the following Documents:
  - a. Document, 00485 HRD Employee Identification Report Form
  - b. Document, 00485 HRD Affidavit of Training Program
2. Delete and replace the following Documents:
  - a. Delete Document, 00130 Invitation to Bid and replace with the attached 00130 Invitation to Bid.
  - b. Delete 00410 Construction Bid Form/Contract and replace with the attached 00410 Construction Bid Form/Contract.

## Contracting Requirements

1. 0800 Supplementary Conditions Add the following sections:  
SC-4.02 Article 4, Paragraph 4.02, Subsurface and Physical Conditions; Subparagraphs A and B are supplemented as follows:

In the preparation of the Contract Documents, the following reports of explorations and tests of subsurface conditions at or contiguous to the Site of the Work were utilized:

1. Report dated September 4, 2020, prepared by TSI; entitled REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION, which may be reviewed in the contract documents or at 4800 e 63rd street. The technical data contained in such report upon which CONTRACTOR may rely is for the Prospect Elevated Water Storage Tanks.

## Specifications

1. Delete Document 01290 Payment Procedures
2. Delete 00515 Construction Contract Required Submissions that has the title “3.0 Million Gallon Elevated Storage Tanks”.
3. Specification 33 16 11 - Delete and replace paragraph 1.05 B with the following:
  - B. Acceptable Manufacturers:
    1. Landmark Structures, LP.
    2. Caldwell Tanks, Inc.
    3. CB&I, a McDermott Company
    4. No equal or substitute.

**NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the Bid Form - Document 00410.**

# Project-Specific Workforce Monthly Report

Human Relations Department - City of Kansas City Missouri

Report Date:	Reporting Period:	Project Description:	
Project Name:	Contractor:	Contract Awarded Date:	
City Project Number:	Contractor Address:	City Contract Number:	
Project Address:		City Vendor ID:	
	Contact Person/Phone:	Contractor Report <input type="checkbox"/>	Subcontractor Report <input type="checkbox"/>
E-mail Address:		Final Cumulative Report:	<input type="checkbox"/> Yes <input type="checkbox"/> No

Report the total monthly hours of work performed by all workers on the City Construction Contract. Enter the total hours on all lines and in all columns. Reported  
 workforce hours should be based on payroll records.

JOB CATEGORIES	OVERALL TOTAL (Sum of all Columns, A thru F Male & Female)	A Total Hours White Employees		B Total Hours Black Employees		C Total Hours Hispanic Employees		D Total Hours Asian/Pacific Islander		E Total Hours Native American Employee		F Total Hours Other/Unknown Race Employee		G KCMO Resident Hours
		M	F	M	F	M	F	M	F	M	F	M	F	Total #
		Foreman/Supervisor												
Asbestos Worker Journeyman														
Asbestos Worker Apprentice														
Boilermaker Journeyman														
Boilermaker Apprentice														
Bricklayer Journeyman														
Bricklayer Apprentice														
Carpenter Journeyman														
Carpenter Apprentice														
Cement Mason Journeyman														
Cement Mason Apprentice														
Electrician Journeyman														
Electrician Apprentice														
Elevator Constructor Journeyman														
Elevator Constructor Apprentice														
Glazier Journeyman														
Glazier Apprentice														
Iron Worker Journeyman														
Iron Worker Apprentice														
Laborer Journeyman														
Laborer Apprentice														
Operating Engineer Journeyman														
Operating Engineer Apprentice														
Painter Journeyman														
Painter Apprentice														
Pipe Fitter/Plumber Journeyman														
Pipe Fitter/Plumber Apprentice														
Plasterer Journeyman														
Plasterer Apprentice														
Roofer Journeyman														
Roofer Apprentice														
Sheet Metal Journeyman														
Sheet Metal Apprentice														
Sprinkler Fitter														
Sprinkler Fitter Apprentice														
Truck Driver Journeyman														
Truck Driver Apprentice														
Welder Journeyman														
Welder Apprentice														
Other														
Monthly Total Hours														-
Total % of Monthly Hrs.														

Contractor shall submit report by the 15th of each month.		Report Submitted By:
Phillip Yelder, Director Human Relations Department		
414 E. 12th Street, 4th Floor	Kansas City, MO 64106	
Phone: 816-513-1836	Email: <a href="mailto:HRDcontractcompliance@kcmo.org">HRDcontractcompliance@kcmo.org</a>	Date:

# Company-Wide Workforce Monthly Report

Human Relations Department - City of Kansas City, Missouri

Report Date:		Reporting Period:		Contract Awarded Date:	
Contractor:				City Vendor ID:	
Contact Person/Phone:		Contractor Address:		Contractor Report <input type="checkbox"/>	Subcontractor Report <input type="checkbox"/>
E-mail Address:		Have you hired any new construction workers this month?	<input type="checkbox"/> Yes #: <input type="checkbox"/> No	Final Cumulative Report: <input type="checkbox"/> Yes <input type="checkbox"/> No	

Report total of all hours of work performed company-wide on all projects in the KCMO Metropolitan Statistical Area (MSA). Enter the total hours on all lines and in all columns. Workforce hours should be based on payroll records.

JOB CATEGORIES	OVERALL TOTAL (Sum of all Columns, A thru F Male & Female)	A Total Hours White Employees		B Total Hours Black Employees		C Total Hours Hispanic Employees		D Total Hours Asian/Pacific Islander		E Total Hours Native American Employee		F Total Hours Other/Unknown Race Employee		G KCMO Resident Hours
		M	F	M	F	M	F	M	F	M	F	M	F	Total #
Foreman/Supervisor														
Asbestos Worker Journeyman														
Asbestos Worker Apprentice														
Boilermaker Journeyman														
Boilermaker Apprentice														
Bricklayer Journeyman														
Bricklayer Apprentice														
Carpenter Journeyman														
Carpenter Apprentice														
Cement Mason Journeyman														
Cement Mason Apprentice														
Electrician Journeyman														
Electrician Apprentice														
Elevator Constructor Journeyman														
Elevator Constructor Apprentice														
Glazier Journeyman														
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Sheet Metal Apprentice														
Sprinkler Fitter														
Sprinkler Fitter Apprentice														
Truck Driver Journeyman														
Truck Driver Apprentice														
Welder Journeyman														
Welder Apprentice														
Other														
Total Monthly Hours														
Total % of Hours														

Contractor shall submit report by the 15th of each month.

Phillip Yelder, Director Human Relations Department 414 E. 12th Street, 4th Floor, Kansas City, MO 64106	Report Submitted By:
Phone: 816-513-1836 Email: <a href="mailto:HRDcontractcompliance@kcmo.org">HRDcontractcompliance@kcmo.org</a>	Date:



## INVITATION TO BID

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

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The General Services Department of Kansas City, Missouri will receive sealed Bids until 2:00 PM, on Tuesday, **February 28, 2023** at 4800 E. 63<sup>rd</sup> St. Trfwy, Kansas City, MO 64130 for **Project/Contract Number: 80001977/9618 – Prospect Elevated Water Storage Tank**. Bids will be opened after that time.

City desires that Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) have a maximum opportunity to participate in the performance of City contracts. The goals for this specific Project are **(7%) MBE** participation and **(4%) WBE** participation.

Bidding Documents will be available online to all interested parties at the Kansas City, Missouri Plan Room, <http://www.kcmoplanroom.org>. All addenda will be posted at this location. Any document or plan may be viewed or downloaded from this location.

Bidders are requested to attend the **Mandatory**, Pre-Bid Conference at **2:00 PM, Tuesday February 14<sup>th</sup>, 2023**, at Water Services Department Auditorium **4800 E 63<sup>rd</sup> Street Trfwy**

Project Manager: John Reddy  
Phone Number: (816) 513-0377  
Fax Number: (816) 513-0343  
E-mail: [John.Reddy@kcmo.org](mailto:John.Reddy@kcmo.org)

Contract Administrator: Bridgette Atkinson  
Phone Number: 816-513-0177  
Fax Number: 816-513-0543  
E-mail: Bridgette.Atkinson@kcmo.org

View all procurement and contracting opportunities at <http://www.kcmo.gov>

Bidder: \_\_\_\_\_

CITY OF FOUNTAINS  
HEART OF THE NATION



## BID FORM/CONTRACT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

KANSAS CITY  
MISSOURI

1. Bidder, having examined the Bidding Documents, related documents and the Site of the Work, and being familiar with all the conditions affecting the construction of the proposed Work, including Laws and Regulations and the availability of materials and supplies, agrees, if this Bid is selected by CITY, this Bid Form/Contract will become the Contract between Bidder and CITY for Bidder to furnish all labor and materials, equipment and services necessary for the proper completion of the Work in accordance with the Contract Documents, including general construction work at the price(s) stated below, which stated sums include fees and all other charges applicable to materials, appliances, labor and all things subject to and upon which other charges may be levied.
2. Bidder agrees the Contract Documents will comprise the entire agreement between CITY and Bidder. The Contract Documents are identified in the General Conditions and are incorporated into and made part hereof this Bid Form/Contract by reference.
3. Bidder agrees that if this Bid Form/Contract is executed by CITY, Bidder's offer is accepted and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the parties. Bidder authorizes the CITY to fill in the Contract Price on this Bid Form/Contract in accordance with Bidder's Bid. Bidder agrees that this Bid Form/Contract may be executed in one or more counterparts, each of which will be deemed an original copy of this Bid Form/Contract and all of which, when taken together, will be deemed to constitute one and the same Bid Form/Contract. This Bid Form/Contract shall be effective upon the execution of counterparts by both parties, notwithstanding that both parties may not sign the same counterpart. The parties' signatures transmitted by facsimile or by other electronic means shall be proof of the execution of this Bid Form/Contract and shall be acceptable in a court of law. A copy of this Bid Form/Contract shall constitute an original and shall be acceptable in a court of law.
4. The Bid Price(s) shall be shown in numeric figures only.

**TOTAL BID IN NUMERIC FIGURES** \$ \_\_\_\_\_

5. **TOTAL BASE** The undersigned Bidder has given CITY'S Project Manager written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by the Project Manager or by the DESIGN PROFESSIONAL is acceptable to Bidder.
6. The undersigned Bidder agrees that this Bid shall remain subject to selection by CITY, and may not be withdrawn for ninety (90) days after the day Bids are opened.
7. The undersigned Bidder acknowledges receipt of the following addenda listed by number and date appearing on each addendum:

Addendum Number	Dated	Addendum Number	Dated
(_____)	(_____)	(_____)	(_____)
(_____)	(_____)	(_____)	(_____)
(_____)	(_____)	(_____)	(_____)



Bidder: \_\_\_\_\_

Subcontract amount \_\_\_\_\_

B. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

C. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

D. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

E. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

*(List additional MBE/WBEs, if any, on additional pages and attach to this form)*

14. By submitting its bid, Bidder is agreeing it will identify and timely submit within 48 Hours after Bid opening those MBE/WBE subcontractors with dollar amounts and scopes of work, which apply to or exceed the MBE/WBE goals for the Project on the **00450 HRD 08 Contractor Utilization Plan/Request for Waiver**.
15. Bidder agrees that failure to meet or exceed the MBE/WBE Goals for the above project will require the Director of Human Relations to recommend disapproval of the bid unless the Director of Human Relations finds the Bidder established good faith efforts towards meeting the goals as set forth in the HRD Forms and Instructions for Construction Projects and the City's MBE/WBE Ordinance.

Bidder: \_\_\_\_\_

Business Entity Type:

- Missouri Corporation
- Foreign Corporation
- Fictitious Name Registration
- Sole Proprietor
- Limited Liability Company
- Partnership
- Joint Venture
- Other: (Specify) \_\_\_\_\_

**BIDDER**

Legal name & address of Bidder, person firm, partnership, corporation, or association submitting Bid:

\_\_\_\_\_ Phone No: \_\_\_\_\_

Cell No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

Bidder's E-Mail: \_\_\_\_\_

\_\_\_\_\_ Federal ID. No. \_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Bidder, person, firm, partnership, corporation or association submitting Bid.

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name)

Title: \_\_\_\_\_

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

(Attach corporate seal if applicable)

**NOTARY**

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

My Commission Expires: \_\_\_\_\_

Bidder: \_\_\_\_\_

**ACCEPTANCE OF BID**

CITY, by executing this Bid Form/Contract, hereby accepts Bidder's Bid and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the Parties.

CITY shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents a maximum amount of \_\_\_\_\_ Dollars, (\$ \_\_\_\_\_). The Contract Price includes:

By executing this Bid Form/Contract, CITY accepts Bidder's offer for the Contract Price stated above and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the parties

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City of Kansas City, Missouri (OWNER or City)

Approved as to form:

---

Assistant City Attorney

I hereby certify that there is a balance, otherwise unencumbered, to the credit of the appropriation to which the foregoing expenditure is to be charged, and a cash balance, otherwise unencumbered, in the treasury, to the credit of the fund from which payment is to be made, each sufficient to meet the obligation hereby incurred.

---

Director of Finance

(Date)

# REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION

KCMO 3MG ELEVATED WATER TANK  
KANSAS CITY, MISSOURI  
TSI PROJECT No. 20201100.00

**BURNS & MCDONNELL**  
9400 Ward Parkway  
Kansas City, Missouri 64114



1340 North Price Road  
St. Louis, Missouri 63132

September 4, 2020



September 4, 2020

Mr. Jeffrey Heidrick, PE  
**BURNS & MCDONNELL**  
9400 Ward Parkway  
Kansas City, Missouri 64114

**Re: Report of Subsurface Exploration and  
Geotechnical Engineering Evaluation  
KCMO 3MG Elevated Water Tank  
Kansas City, Missouri  
TSi Project No. 20201100.00**

Dear Mr. Heidrick:

TSi Geotechnical, Inc. (TSi) has completed the authorized Subsurface Exploration and Geotechnical Engineering Evaluation for the referenced project and is pleased to submit this report of our findings. The purpose of our work was to assess subsurface conditions at specific test boring locations in order to prepare geotechnical recommendations for the design and construction of 3.0 Million Gallon Elevated Water Storage Tank in Kansas City, Missouri. This report presents the field and laboratory data, and includes our evaluations and recommendations relative to the geotechnical engineering aspects of the project.

We appreciate the opportunity to assist you with this project. If you have any questions, or if we may be of further service to you, please call us.

Respectfully submitted,  
**TSI GEOTECHNICAL, INC.**

*Arad Nickan*

Arad Nickan, PE\*  
Project Manager  
\*Licensed in State of Texas

*Nilesh Lal*  
Nilesh Lal, PE  
Senior Project Manager



*Denise B. Hervey*  
Denise B. Hervey, PE  
Principal

PROFESSIONAL SERVICES SINCE 1989

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REPORT OF SUBSURFACE EXPLORATION AND  
GEOTECHNICAL ENGINEERING EVALUATION  
KCMO 3 MG ELEVATED WATER TANK  
KANSAS CITY, MISSOURI

## 1.0 SCOPE OF WORK

This report summarizes the results of a subsurface exploration and geotechnical evaluation completed for use in the design and construction for the proposed 3.0 Million Gallon Elevated Water Storage Tank in Kansas City, Missouri. The study was performed in general accordance with TSi's proposal to Burns & McDonnell (BMcD), dated April 15, 2020 and BMcD's Professional Geotechnical Consultant Agreement (Doc. No. SP-2B Geotech) authorized on April 30, 2020.

The purpose of this geotechnical study is to provide recommendations for site preparation and design and construction of a deep foundation system to support the proposed elevated tank at this site. Based on TSi's understanding of the project, the following items have been identified to be included in this report:

- subsurface conditions, including material types present at the boring locations, and their impact on the proposed construction;
- field and laboratory test results for materials encountered and sampled at the borings;
- drilled pier design and construction recommendations for the proposed elevated storage tank;
- LPILE design parameters for lateral load-displacement analysis;
- load-settlement estimates for drilled piers;
- seismic design recommendations, including site class in accordance with the International Building Code (IBC) and ASCE 7, based on the general character of the subsurface materials;
- the presence of any unsuitable soils encountered at the boring locations;
- site preparation considerations, including recommendations regarding fill and backfill placement;
- recommendations for observation and testing services during construction.

## 2.0 PROJECT AND SITE DESCRIPTIONS

The following project understanding is based on our discussions with BMcD and site reconnaissance by an engineer from TSi. The proposed 3 million gallon elevated water storage tank is located near the intersection of 129<sup>th</sup> Street and Robinson Pike Road in Kansas City, Missouri. The elevated storage tank will be located south of this intersection on the suction side of the proposed pump station.

The general location of the tank site is shown on the Vicinity Map, Figure 1 in Appendix A. General site features and the locations of the test borings performed for this study are provided on the Site and Boring Location Plan, Figure 2 in Appendix A.

### 3.0 FIELD EXPLORATION AND LABORATORY TESTING

#### 3.1 FIELD EXPLORATION

On June 9 through June 10, 2020, TSi conducted a subsurface exploration at this site. The field exploration consisted of completing six borings, designated as Boring B-1 through B-6. The borings were drilled by a CME-550 all-terrain-mounted rotary drill rig, using hollow-stem auger drilling methods. The boring locations were selected by BMcD and marked in the field by TSi. The boring locations were staked by TSi using a hand-held GPS device at the co-ordinates provided by BMcD. The approximate location of each boring is indicated on the Site and Boring Location Plan, Figure 2.

A geotechnical specialist from TSi supervised the drilling and sampling procedures, and collected and classified the samples recovered. Split-spoon samples, where possible, were recovered from the borings using a 2-inch outside-diameter, split-barrel sampler, driven by an automatic hammer, in accordance with ASTM D 1586. Shelby tube samples were obtained in accordance with ASTM D 1587. The split-spoon samples were placed in glass jars and saved for later testing in the laboratory. The Shelby tube samples were preserved by sealing the entire sample in the tube. The excavated soil was stockpiled and used as backfill for the borings. The sampling sequence for the borings are summarized on the Logs of Boring in Appendix B of this report.

The results of the field tests and measurements were recorded on field logs and appropriate data sheets. Those data sheets and logs contain information concerning the boring methods, samples attempted and recovered, indications of the presence of various subsurface materials, and the observation of groundwater. The field logs and data sheets contain the geotechnical specialist's interpretations of the conditions between samples, based on the performance of the drilling equipment and the cuttings brought to the surface by the drilling tools.

#### 3.2 LABORATORY TESTING

A laboratory testing program was conducted by TSi to determine selected engineering properties of the obtained soil samples. The results of the individual tests are presented on the Logs of Boring and in the Laboratory Test Results in Appendix D. The following laboratory tests were performed on the samples recovered from the borings according to applicable ASTM standards:

- visual descriptions by color and texture of each sample;
- hand penetrometer determinations of the approximate compressive strength of cohesive samples;
- natural moisture content of each cohesive sample;
- Atterberg limits on selected cohesive samples;
- unit weight of selected samples; and

- unconfined compression tests on selected soil rock core and samples.

Data and observations from laboratory tests were recorded on laboratory data sheets during the course of the testing program. The results of the laboratory tests are summarized on the Logs of Boring. The logs represent considered interpretation of the field and laboratory data. The analyses and conclusions contained in this report are based on field and laboratory test results and on the interpretations of the subsurface conditions as reported on the logs. Only data pertinent to the objectives of this report have been included on the logs; therefore, these logs should not be used for other purposes.

## 4.0 SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered at the test borings are presented on the Logs of Boring in Appendix B. The general subsurface conditions encountered and their pertinent engineering characteristics are described in the following paragraphs. Conditions represented by the borings should be considered applicable only at those exploration locations on the dates shown; the reported conditions may be different at other locations or at other times.

### 4.1 GENERAL GEOLOGY

The local site area within the City of Kansas City is made of up floodplain and residual soils, primarily consisting of lean clays. The general Kansas City geology was shaped by Pleistocene ice sheets that formed the current river valleys. Glacial deposits and wind-blown loess form a major part of the regional surficial deposits. Bedrock in the general area consists of Pennsylvanian age rock of the Kansas City Group which are comprised of cyclical deposits of well-consolidated limestone and shale, with minor sandstone and coal deposits throughout the section.

### 4.2 GENERALIZED SOIL PROFILE

In general, soil profile consists of topsoil with organic matters in the upper 6 inches underlain by a reddish brown layer of low-plasticity lean clay (CL, in accordance with the Unified Soil Classification System) followed by layers of limestone and shale bedrock to the termination depths of our borings. The standard penetration test (N) values in clay ranges from 8 blows per foot (bpf) to 50 blows over 1½ inch penetration with an average value of 15 bpf and moisture content ranging from 5 to 35%. The Atterberg limits tests on samples of clay resulted in liquid limits (LL) of 44 to 45 and plasticity index (PI) of 21 to 23. In addition, existing fill materials with/trace organic substances were observed within approximately upper 1½ foot of Boring B-4.

### 4.3 GROUNDWATER

Groundwater was not encountered in the borings during drilling. The presence or absence of groundwater at a particular location does not necessarily mean that groundwater will be present or absent at that location at other times. Seasonal variations and other unknown considerations could cause fluctuations in water levels.

## 5.0 DESIGN RECOMMENDATIONS

### 5.1 DRILLED PIER FOUNDATIONS

The proposed elevated storage tank can be supported by drilled pier foundation system. Drilled piers may be designed for vertical compression loads using the allowable side friction and end-bearing values presented below:

**TABLE 1.1.  
 PARAMETERS FOR DRILLED PIER DESIGN**

<b>Depth Range (ft)</b>	<b>Soil Classification</b>	<b>Allowable Unit Side Resistance (psf)</b>	<b>Allowable End-Bearing (psf)</b>
0 to 5	Medium Stiff Clay	240	2,900
5 to 8	Medium to Very Stiff Clay	650	3,500
8 to 14	Highly Weathered Shale	1,450	3,500
14 to 35	Moderately Weathered Shale	2,500	3,500
35 to 40	Limestone	7,500	4,500
40 to 45	Shale	3,000	4,500
45 to 52	Shaley Limestone Bedrock	5,000	6,500
52 to 65	Shale Bedrock	2,500	6,500

psf = pounds per square foot Note: piers should be embedded 1 pier diameter to achieve end bearing capacity.

For uplift resistance (downward skin friction) consideration, the allowable side shears in the above table should be multiplied with a factor 0.67. The recommended values provided for vertical support were developed using nominal factors of safety of 2.5 for the side friction and 3 for the end-bearing. When using the recommended side friction values, the upper 3 feet of the pier should not be considered for the both gravity and uplift forces, in order to account for seasonal variations in soil moisture, disturbance during drilled shaft installation, and other factors. The length of each pier should be at least four times the diameter to use the full end-bearing value stated. If both side friction and end-bearing are used to determine the allowable capacity of a pier, the length of the pier from the base upward for one diameter should not be considered in the calculation of side friction, to account for soil-structure interaction at the base. In addition, the bearing capacity value provided for each specific layer is valid, if the shaft base is above the bottom of the layer for a minimum of 2 feet or 1 pier diameter, whichever is greater. Otherwise, the lower bearing capacity between the layer that piers are installed and its underlying layer should be considered.

The structural loads are expected to result in some compression of the supporting soils surrounding the piers. Based on the general character of the soil and assuming the drilled pier foundations are properly installed, the maximum anticipated settlement of these foundations should be less than 1 inch. The majority of this settlement should take place during construction as the structural loads are applied to the foundations.

The design of drilled piers to resist lateral loads may be accomplished using the LPILE 2019 or later analysis program. Based on the conditions encountered at the borings, the following parameters are estimated for use in the analysis of the lateral capacity of the drilled piers:

**TABLE 2.1.**  
**SOIL PARAMETERS FOR USE IN LPILE ANALYSIS**

Depth (ft)	Soil Classification	LPILE Material Type <sup>1</sup>	Effective Unit Weight (pcf)	Undrained Cohesion (psf)	Strain at 50% Maximum Stress <sup>2</sup>	Angle of Internal Friction (degrees)	p-y Soil Modulus K <sub>static</sub> (pci)
0 to 5	Medium Stiff Clay	3	125	1,000	0.007	N/A	500
5 to 8	Medium to Very Stiff Clay	3	125	3,000	0.005	N/A	900
8 to 14	Highly Weathered Shale	4	135	N/A	N/A	36	K=150
14 to 35	Moderately Weathered Shale	4	135	N/A	N/A	36	K=150
35 to 40	Limestone	6	160	N/A	q <sub>u</sub> =5,500 psi	N/A	N/A
40 to 45	Shale	9	150	N/A	q <sub>u</sub> = 1,000 psi RQD = 50% E <sub>r</sub> = 50,000 psi K <sub>rm</sub> = 0.0005	N/A	N/A
45 to 52	Shaley Limestone Bedrock	6	160	N/A	q <sub>u</sub> =2,800 psi	N/A	N/A
52 to 65	Shale Bedrock	9	150	N/A	q <sub>u</sub> = 950 psi RQD = 40% E <sub>r</sub> = 50,000 psi K <sub>rm</sub> = 0.0005	N/A	N/A

pcf = pounds per cubic foot                      psf = pounds per square foot                      pci = pounds per cubic inch

<sup>1</sup> Material Type: 3 = Stiff Clay without Free Water, 4 = Sand (Reese) 6 = Hard Rock, 9 = Soft Rock

<sup>2</sup> LPILE requires input of unconfined compressive strength (q<sub>u</sub>), Young's Modulus (E<sub>r</sub>), k<sub>rm</sub> and RQD, for weak rock models and q<sub>u</sub>, for strong rock models.

Group Effect – Axially Loaded

Drilled shafts should be spaced a minimum of three (3) diameters center-to-center. A pier group should include a minimum of three (3) piers. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual piers in a group versus the capacity calculated using the perimeter and base of the group acting as a unit. The lesser of the two capacities should be used in design.

Group Effect – Laterally Loaded

Laterally loaded piers can have varying degrees of group interactions when center-to-center spacing are less than six diameters in the direction of loading. Allowable passive resistance provided by a row of piers in line with the direction of the load should be reduced by using a p-multiplier ( $P_m$ ) method using lateral loading software of a single pier, such as LPILE. This method scales the p-y curves of a single pier to determine the group effect. The recommended p-multipliers are shown in Table 3.1. below.

**TABLE 3.1.  
 RECOMMENDED P-MULTIPLIER,  $P_m$ , VALUES FOR DESIGN BY ROW POSITION**

Pier Spacing (c-c)	P-Multiplier, $P_m$			
	3D	4D	5D	$\geq 6D$
Lead Row	0.7	0.85	1.0	1.0
2nd Row	0.5	0.65	0.85	1.0
3rd and higher Rows	0.35	0.5	0.7	1.0

From: Federal Highway Administration (FHWA) Drilled Shafts Manual

5.5 REGIONAL SEISMICITY

Based on the general soil characteristics as determined by field and laboratory tests and the estimated depth to bedrock, the project area is designated as Site Class C, in accordance with the International Building Code (IBC) and ASCE 7. We note that for the purpose of site classification the soil data within the upper 100 feet of soil profile should be considered; whereas in this project a maximum drilling depth of 65 feet below existing grade was achieved. The site classification provided in this section is based on this assumption that the shale materials encountered at a depth of 65 feet, extend to depths of 100 feet below ground surface or deeper.

## 6.0 SITE PREPARATION AND EXCAVATION CONSIDERATIONS

### 6.1 SUBGRADE PREPARATION

Prior to construction, the areas of the new substation should be stripped of any vegetation, organic soil, existing fill and any deleterious materials. Stripping the upper zone of visible roots and organic material to depths of 6 to 12 inches should be sufficient to result in a stable subgrade, but should be verified by on-site observation. After stripping, the exposed subgrade should be proofrolled, which can be accomplished by passing over the subgrade with a loaded tandem axle dump truck and observing the subgrade for pockets of excessively soft, wet, disturbed, or otherwise unsuitable soils. Any unacceptable materials thus found shall be excavated and either recompacted or replaced with new structural fill. Prior to placing fill over the natural soil, the subgrade should be scarified to a depth of about 6 inches, the moisture content of the soil adjusted to near its optimum moisture content, and the subgrade recompacted in accordance with the project specifications prior to proceeding with construction activities. The recommended proofrolling and recompaction of the subgrade may be waived by TSi if it is determined, based on field observations, that it is unnecessary or could be detrimental to the existing subgrade condition.

### 6.2 SUBGRADE PROTECTION

Construction areas should be properly drained in order to reduce or prevent surface runoff from collecting on the subgrade. Pounded water on the exposed subgrade should be removed immediately. To prevent unnecessary disturbance of the subgrade soils, heavy construction vehicles should be restricted from traveling through the finished subgrade. If areas of disturbed subgrade develop, they should be properly repaired in accordance with the recommendations in this report.

### 6.3 DRILLED PIER CONSTRUCTION

It is recommended that drilled pier construction be performed by an experienced, knowledgeable contractor familiar with the conditions in the project area. The contractor should be prepared to handle groundwater seepage into the pier excavations and the potential for sloughing or caving of the pier sidewalls. A temporary casing and pumps will likely be necessary for pier construction. It is possible that the slurry method may be needed if the sand seams or layers prove to be unstable during drilled pier construction.

Each pier should be cast the same day it is excavated and approved. For dry hole placement with water seepage, the pier base should be continually pumped as necessary to prevent the accumulation of water. Less than 2 inches of water accumulation should be allowed at the time of concrete placement. Concrete should be placed in a manner to prevent segregation. If temporary casing is necessary to prevent caving or sloughing of the pier sides, it should be extended to the pier base and left in place until several feet of concrete is placed in the pier. A minimum of 5 feet of concrete should be maintained above the casing bottom as it is withdrawn during concrete placement.

#### 6.4 FILL AND BACKFILL MATERIALS

It may be expedient to import crushed limestone aggregate for use as fill and backfill. The upper soils at most boring locations consist of lean clay with a plasticity index less than 23. At these locations, the soil observed which are free of organic materials, roots and other deleterious substances would be suitable for use as new structural fill. Off-site fill, if needed, should consist of minus gradation crushed limestone or lean clay having a plasticity index of less than 25, and a maximum particle size of 2 inches, and should be free of degradable materials such as wood, metal, organic matter or other deleterious materials. Off-site fill should be approved by TSi prior to being imported to the job site. If this facility is constructed during the winter season, fill materials should be carefully observed to see that no ice or frozen soils are placed as fill or remain in the base materials upon which fill is placed.

#### 6.5 FILL AND BACKFILL PLACEMENT

Lean clay fill placed for structure support should be compacted to a dry density of at least 95% of the standard Proctor maximum dry density (ASTM D 698) of the soil. Fat clays with a liquid limit more than 50 should not be used as structural fill or backfill. Granular material, such as crushed limestone that is placed for structure support, should be compacted to at least 100% of the standard Proctor maximum dry density. The moisture content of fill at the time of compaction should generally be within plus or minus 3% of the optimum moisture content of the material as determined by the standard Proctor compaction test. Fill should be placed in loose lifts not in excess of 8 inches thick, and compacted to the aforementioned criterion. However, it may be necessary to place fill in thinner lifts to achieve the recommended compaction when using small hand-operated equipment.

At this time, the moisture content of the on-site soil is variable, and at the time of construction may not be within a range necessary for proper placement and compaction. Prior to compaction, some of the soil may require moisture reduction. During warm weather, moisture reduction can generally be accomplished by disking, or otherwise aerating the soil. Some of the soil may require the addition of moisture prior to compaction. This should be performed in a controlled manner, and the moistened soil should be thoroughly blended with a disk or pulverizer to produce a uniform moisture content. Repeated passages of the equipment may be required to achieve uniform moisture content.

#### 6.6 SOIL SENSITIVITY

The upper, soils encountered at the site are considered moderately sensitive and susceptible to strength loss caused by excess moisture or disturbance by construction activity. Repetitious passage of equipment can result in rutting and “pumping” (deflection under passing load), even if the soil was properly compacted. Once disturbed, extensive effort is required to restore the integrity of the soils.

General site grading activities and excavations for utilities and foundations must be performed in a manner that limits disturbance to subgrade soils. The contractor should select earth moving equipment carefully and should be prepared to adjust the type or usage of the equipment as necessary to minimize distress to the subgrade. If wet weather or soft subgrade conditions persist, it may be necessary to stabilize the subgrade with a moisture-reducing chemical.

## 7.0 CONSTRUCTION OBSERVATION AND TESTING

It is recommended that TSi be retained during construction to perform testing and observation services for the following items:

- proofrolling, recompaction, and preparation of the soil subgrade that will support new fill or structural elements;
- evaluation of the suitability of fill and backfill materials;
- placement and compaction of fill and backfill;
- observation and documentation of the installation of drilled pier foundations; and
- quality assurance testing for concrete materials.

These quality assurance services should help to verify the design assumptions and maintain construction procedures in accordance with the project plans, specifications, and good engineering practice.

## 8.0 REPORT LIMITATIONS

This report has been prepared for the exclusive use of **BURNS & MCDONNELL** for the specific application to the subject project. The recommendations contained in this report have been made in accordance with generally accepted soil and foundation engineering practices; no other warranties are implied or expressed.

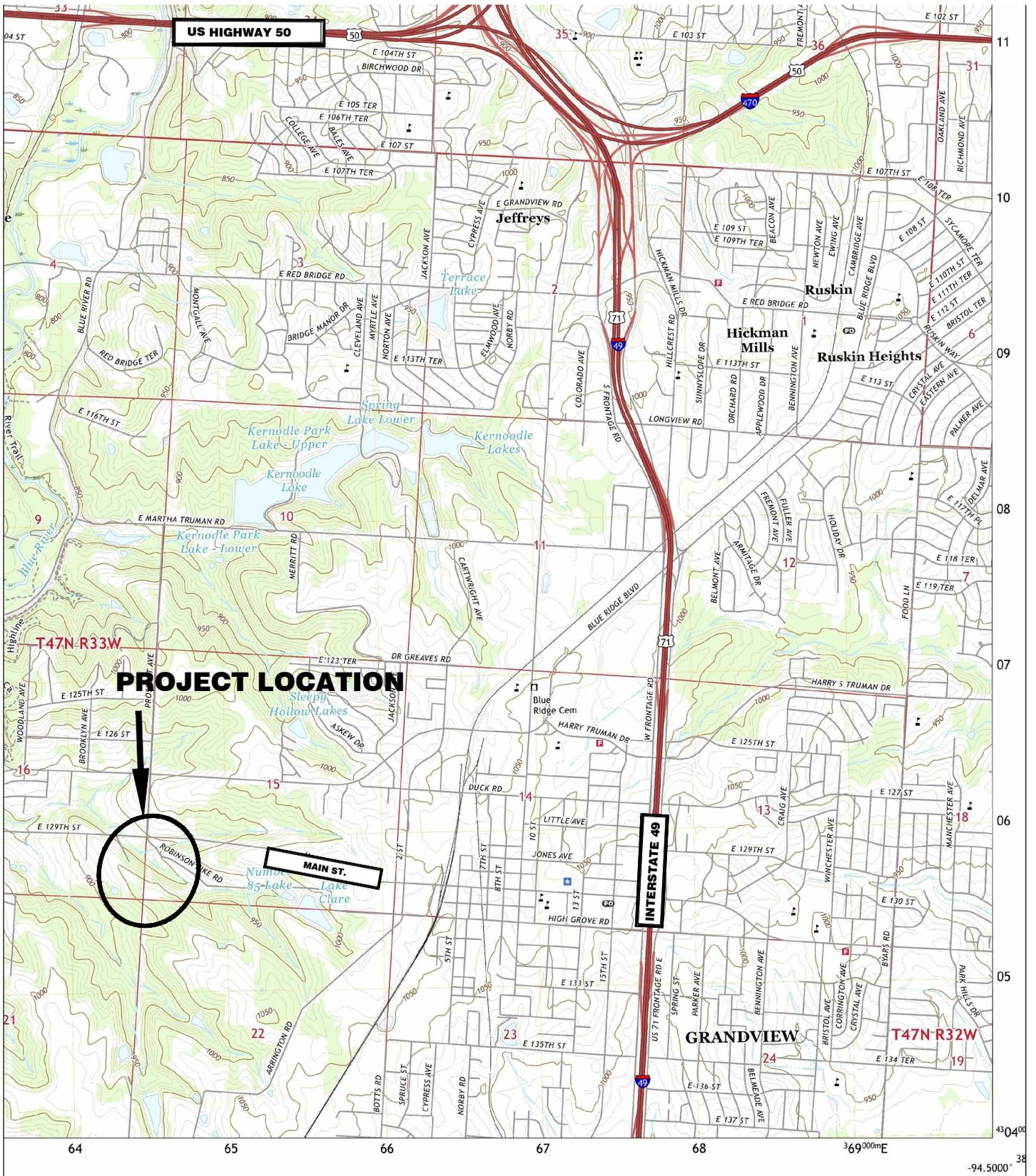
The analyses and recommendations submitted in this report are based in part upon the data obtained from the test borings. The nature and extent of variations away from the borings may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of this report.

We emphasize that this report was prepared for design purposes only and may not be sufficient to prepare an accurate construction bid. Contractors reviewing this report should acknowledge that the information and recommendations contained herein are for design purposes.

If conditions at the site have changed due to natural causes or construction operations, this report should be reviewed by TSi to determine the applicability of the analyses and recommendations considering the changed conditions. The report should also be reviewed by TSi if changes occur in the structure locations, sizes, and types, or in the planned loads, elevations, or project concepts.

TSi requests the opportunity to review the final plans and specifications for the project prior to construction to verify that the recommendations in this report are properly interpreted and incorporated in the design and construction documents. If TSi is not accorded the opportunity to make this recommended review, we can assume no responsibility for the misinterpretation of our recommendations.

# APPENDIX A



NOT TO SCALE

NOTE:  
DRAWING PREPARED FROM AN IMAGE  
OBTAINED FROM USGS TOPOMAPS  
ON 06/15/20



1340 NORTH PRICE ROAD  
ST. LOUIS, MISSOURI 63132

VICINITY MAP

3MG ELEVATED WATER TANK  
GRANDVIEW, MISSOURI

Drawn By: HNG

Checked By: AR

Project No. 20201100.00

Date: 06/15/20

Figure 1



LEGEND

**B-1**  APPROXIMATE BORING LOCATION AND NUMBER

NOTE: THIS PLAN WAS PREPARED FROM A DRAWING OBTAINED FROM  
BURNS & MCDONNELL ON 04/03/20.

NOT TO SCALE



1340 NORTH PRICE ROAD  
ST. LOUIS, MISSOURI 63132

SITE AND BORING LOCATION PLAN

3MG ELEVATED WATER TANK  
GRANDVIEW, MISSOURI

Drawn By: HNG

Checked By: AR

Project No. 20201100.00

Date: 6/15/20

Figure 2

# APPENDIX B

# LOG OF BORING NO. B-1

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches	Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Surface El.: <b>959.0</b> Location: <b>Lat:38.8896352</b> <b>Long:-94.5623024</b>										
				TOPSOIL, with organics (6") Brown and red, lean CLAY (CL), trace organics			5 5 6	2.50			27			
5		SS-1			78									
		SS-2		- with gravel below 4.0 ft.	94		5 6 23	2.25			23			
		SS-3		LIMESTONE, gray, highly weathered	72		21 15 13							
10		SS-4		SHALE, reddish brown, soft to hard, highly weathered	78		17 18 23							
15		SS-5		- gray below 13.5 ft.	100		50/4.5'				8			
				Boring terminated at 17.0 ft.										
25														
Completion Depth: 17.0 Date Boring Started: 6/10/20 Date Boring Completed: 6/10/20 Engineer/Geologist: NH Project No.: 20201100.00				Remarks: Boring drilled with CME-550 using HSA and auto SPT. Groundwater not encountered during drilling. Auger refusal at 17.0 ft.										

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

# LOG OF BORING NO. B-2

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Surface El.: <b>960.0</b> Location: <b>Lat:38.8895254</b> <b>Long:-94.5623023</b>									
				TOPSOIL (6") Reddish brown and gray, lean CLAY (CL) - trace organics from 1.0 to 2.5 ft.	53		5 5 4	2.50		23			
		SS-1											
		ST-2			75			2.25	1.47	103	23	44	23
5													
		SS-3		- with limestone fragments from 6.0 to 7.1 ft.	100		3 14 50/1.5"			35			
		SS-4		LIMESTONE, gray, highly to completely weathered - slightly weathered from 9.3 to 10.0 ft.	100		24 50/4"						
10													
				LIMESTONE, light gray, hard, highly weathered									
				SHALE, Brown and gray, hard, highly weathered									
		RUN1			60	6.00							
				- core loss from 13.0 to 15.0 ft.									
15													
				SHALE, gray, hard, slightly highly weathered - slightly weathered from 15.3 to 19.9 ft.									
		RUN2			98	41.00							
				- moderately weathered from 20.0 to 21.2 ft.									
20													
				- dark gray, soft, highly weathered below 21.7 ft.									
		RUN3			97	51.00							
25				Boring terminated at 25 ft.									
Completion Depth: 25.0 Date Boring Started: 6/9/20 Date Boring Completed: 6/9/20 Engineer/Geologist: NH Project No.: 20201100.00				Remarks: Boring drilled with CME-550 using HSA and auto SPT. Groundwater not encountered during drilling. Auger refusal at 9.5 ft.									

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

# LOG OF BORING NO. B-3

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSI Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	Surface El.: 959.0 Location: Lat:38.8895802 Long:-94.5622031	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches	Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
MATERIAL DESCRIPTION														
				TOPSOIL, with organics (6") Brown, lean CLAY (CL) - trace organics from 1.0 to 5.0 ft.	72		4 4 5	2.75		27				
		SS-1												
		SS-2			100		3 5 6	2.50		24				
5		ST-3			100			2.00		25				
		SS-4		- with limestone fragments from 8.5 to 10.0 ft.	61		16 9 9			19				
10														
		SS-5		SHALE, gray, soft to hard, highly to completely weathered - no recovery from 13.5 to 14.0 ft.	0		50/6"							
15														
		SS-6		SHALE, gray, soft to hard, highly to completely weathered	100		50/1.5"			6				
20				Boring terminated at 20 ft.										
25														

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

Completion Depth: 18.0  
 Date Boring Started: 6/9/20  
 Date Boring Completed: 6/9/20  
 Engineer/Geologist: NH  
 Project No.: 20201100.00

Remarks: Boring drilled with CME-550 using HSA and auto SPT.  
 Groundwater not encountered during drilling.  
 Auger refusal at 18.0 ft.

The stratification lines represent approximate strata boundaries.  
 In situations, the transition may be gradual.

# LOG OF BORING NO. B-4

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches	Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Surface El.: <b>956.0</b> Location: <b>Lat:38.8896737</b> <b>Long:-94.5622392</b>										
				TOPSOIL, with organics (6")										
		SS-1		FILL: brown lean CLAY (CL), trace organics			4							
				Reddish brown, lean CLAY (CL)	72		5 6	2.25			22			
		ST-2			75			3.75	1.35	100	25	45	22	23
5														
				LIMESTONE, grayish brown, hard, highly weathered -diagonal and vertical fracture from 5.9 to 7.5										
		RUN1		SHALE, tan brown, soft, highly weathered	45									
10														
				Boring terminated at 10.5 ft.										
15														
20														
25														
Completion Depth: 10.5 Date Boring Started: 6/10/20 Date Boring Completed: 6/10/20 Engineer/Geologist: NH Project No.: 20201100.00				Remarks: Boring drilled with CME-550 using HSA and auto SPT. Groundwater not encountered during drilling. Auger refusal at 5.5 ft.										

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

# LOG OF BORING NO. B-5

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches	Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Surface El.: <b>957.0</b> Location: <b>Lat:38.889676</b> <b>Long:-94.5623614</b>										
				TOPSOIL, with organics (6") FILL: dark brown, lean CLAY (CL)										
		SS-1		Redish brown, lean CLAY (CL)	56		4 4 5	2.75			26			
5		SS-2			92		4 5 6	3.00			26			
		SS-3			67		16 19 11	>4.5			25			
10		SS-4		Brownish gray, moderately hard, highly to completely weathered, SHALE	100		5 11 32				21			
15		SS-5		- tan and gray, very soft from 13.5 to 13.8 ft.	100		50/3"				22			
20		SS-6		- gray, hard from 18.5 to 18.6 ft. No sampling from 18.6 to 35.0 ft. possible shale from cuttings.	100		50/1.5"							
25														

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

Completion Depth: 65.0  
 Date Boring Started: 6/9/20  
 Date Boring Completed: 6/10/20  
 Engineer/Geologist: NH  
 Project No.: 20201100.00

Remarks: Boring drilled with CME-550 using HSA and auto SPT.  
 Groundwater not encountered during drilling.  
 Auger refusal at 35 ft.

The stratification lines represent approximate strata boundaries.  
 In situations, the transition may be gradual.

# LOG OF BORING NO. B-5

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	Surface El.: 957.0 Location: Lat:38.889676 Long:-94.5623614	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				MATERIAL DESCRIPTION									
			AUGER	No sampling from 18.6 to 35.0 ft. possible shale from cuttings.									
35		RUN1		LIMESTONE, gray, hard, slightly to highly weathered	100	0.00							
		RUN2		- gray and dark green shale seams from 36.0 to 40.5 ft.	100	48.00							
40		RUN3		SHALE, dark gray, soft to moderately hard, slightly to moderately weathered	100	33.00							
45		RUN4		SHALEY LIMESTONE, dark gray, moderately hard, slightly weathered									
				- vertical fracture from 47.5 to 49.8 ft.	100	51.50							
				- light gray, slightly weathered from 49 to 52.1 ft.									
50	Completion Depth: 65.0 Date Boring Started: 6/9/20 Date Boring Completed: 6/10/20 Engineer/Geologist: NH Project No.: 20201100.00			Remarks: Boring drilled with CME-550 using HSA and auto SPT. Groundwater not encountered during drilling. Auger refusal at 35 ft.									

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

# LOG OF BORING NO. B-5

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	Surface El.: <b>957.0</b> Location: <b>Lat:38.889676</b> <b>Long:-94.5623614</b>	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				MATERIAL DESCRIPTION									
				LIMESTONE, light gray, slightly to highly weathered, finely crystalline									
		RUN5		SHALE, dark gray and dark green, soft to moderately hard, moderately to highly weathered	100	34.00							
55													
		RUN6			100	53.00							
60													
		RUN7			98	17.50							
65				Boring terminated at 65.0 ft.									
70													
75													
Completion Depth: 65.0 Date Boring Started: 6/9/20 Date Boring Completed: 6/10/20 Engineer/Geologist: NH Project No.: 20201100.00				Remarks: Boring drilled with CME-550 using HSA and auto SPT. Groundwater not encountered during drilling. Auger refusal at 35 ft.									

HANSON LOG WITH LAB GINT LOGS 3MG WATER TANK.GPJ 8/12/20

The stratification lines represent approximate strata boundaries.  
 In situations, the transition may be gradual.

# LOG OF BORING NO. B-6

Project Description: **3MG Elevated Water Tank**  
**Grandview, Missouri**

TSi Geotechnical Inc.  
 1340 North Price Road  
 St. Louis, Missouri 63132  
 (314) 373-4000 (314) 227-6622 FAX



Depth, feet	Samples	Sample #	Graphic Log	Surface El.: 960.0 Location: Lat:38.8895789 Long:-94.5624011	Recovery %	Qu from Rimac TSF	Penetration Blows Per 6 inches	Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				MATERIAL DESCRIPTION										
				TOPSOIL, with organics (6")										
		SS-1		Red-brown, lean CLAY (CL) - trace organics from 1.0 to 5.0 ft.	72		3 4 4	2.25			28			
5		ST-2			81			1.75			22			
		SS-3		- with limestone fragments from 6.0 to 10.0 ft.	89		4 11 19				41			
		SS-4			82		14 50/2.5				5			
10				Boring terminated at 10.5 ft.										
15														
20														
25														
Completion Depth: 10.5 Date Boring Started: 6/9/20 Date Boring Completed: 6/9/20 Engineer/Geologist: NH Project No.: 20201100.00				Remarks: Boring drilled with CME-550 using HSA and auto SPT. Groundwater not encountered during drilling. Auger refusal at 10.5 ft.										

HANSON LOG WITH LAB. GINT LOGS 3MG WATER TANK.GPJ 8/12/20

The stratification lines represent approximate strata boundaries.  
 In situations, the transition may be gradual.

## GENERAL NOTES

The number of borings is based on: topographic and geologic factors; the magnitude of structure loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling are selected to reduce the possibility of undiscovered anomalies and maintain drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as the presence of water, boulders, gas, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation in resistance to driving split-spoon samplers, unusual odors, etc. However, lack of notation regarding these occurrences does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Logs of Boring may not have stabilized, particularly in more impermeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of precipitation, infiltration, or other factors not evident at the time indicated.

Unless otherwise noted, soil classifications indicated on the Logs of Boring are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness are described as layers within a stratum, while thicker zones are logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Logs of Boring are approximate boundaries only, as the actual material change may be between samples or may be a gradual transition.

Samples chosen for laboratory testing are selected in such a manner as to measure selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and not all samples undergo a complete series of tests, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.

## NOTATION USED ON BORING LOGS

APPROXIMATE PROPORTIONS		PARTICLE SIZE	
<b>TRACE</b>	<15%	<b>BOULDERS</b>	>12 Inches
<b>WITH</b>	15-30%	<b>COBBLES</b>	12 Inches – 3 Inches
<b>MODIFIER</b>	>30%	<b>GRAVEL</b>	
		<b>Coarse</b>	3 Inches – ¾ Inch
		<b>Fine</b>	¾ Inch – No. 4 Sieve (4.750 mm)
		<b>SAND</b>	
		<b>Coarse</b>	No. 4 – No. 10 Sieve (2.000 mm)
		<b>Medium</b>	No. 10 – No. 40 Sieve (0.420 mm)
		<b>Fine</b>	No. 40 – No. 200 Sieve (0.074 mm)
		<b>SILT</b>	No. 200 Sieve - 0.002 mm
		<b>CLAY</b>	< 0.002 mm

Clay or clayey may be used as major material or modifier, regardless of relative proportions, if the clay content is sufficient to dominate the soil properties.

### PENETRATION – BLOWS

Number of impacts of a 140-pound hammer falling a distance of 30 inches to cause a standard split-barrel sampler, 1 3/8 inches I.D., to penetrate a distance of 6 inches. The number of impacts for the first 6 inches of penetration is known as the seating drive. The sum of the impacts for the last 12 inches of penetration is the Standard Penetration Test Resistance or “N” value, blows per foot. For example, if blows = 6-8-9, “N” = 8+9 or 17.

### OTHER NOTATIONS

Recovery % – length of recovered soil divided by length of sample attempted.  
50/2” Impacts of hammer to cause sampler to penetrate the indicated number of inches  
WR Sampler penetrated under the static loading of the weight of the drill rods  
WH Sampler penetrated under the static loading the weight of the hammer and drill rods  
HSA Hollow stem auger drilling method  
FA Flight auger drilling method  
RW Rotary wash drilling methods with drilling mud  
AH Automatic hammer used for Standard Penetration Test sample  
SH Safety hammer with rope and cathead used for Standard Penetration Test sample

### GRAPHIC SYMBOLS

-  Depth at which groundwater was encountered during drilling
-  Depth at which groundwater was measured after drilling
-  Standard Penetration Test Sample, ASTM D1586
-  3-inch diameter Shelby Tube Sample, ASTM D1587
-  Sample grabbed from auger
-  NX Size rock core sample

# UNIFIED SOIL CLASSIFICATION SYSTEM, (ASTM D-2487)

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria			
Coarse-grained soils (More than half of materials is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	<b>GW</b>	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3		
		<b>GP</b>	Poorly graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 per cent More than 12 per cent 5 to 12 per cent			
		Gravels with fines (Appreciable amount of fines)	<b>GM<sup>a</sup></b>		d	Silty gravels, gravel-sand-silt mixtures	Not meeting all gradation requirements for GW
					u		
		<b>GC</b>	Clayey gravels, gravel-sand-clay mixtures		Above "A" line with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual symbols		
		Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	<b>SW</b>		Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
	<b>SP</b>		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW			
	Sands with fines (Appreciable amount of fines)		<b>SM<sup>a</sup></b>		d	Silty sands, sand-mix mixtures	Atterberg limits about "A" line or P.I. less than 4
					u		
	<b>SC</b>		Clayey sands, sand-clay mixtures		Atterberg limits about "A" line with P.I. greater than 7		
	Fine-grained soils (More than half of materials is smaller than No. 200 sieve size)		Silts and clays (Liquid limit less than 50)	<b>ML</b>		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	<p style="font-size: small;">For classification of fine-grained soils and fine-grained fraction of coarse-grained soils:                      Equation of "A"-line: Horizontal at PI=4 to LL=25.5, then PI=0.73(LL-20)                      Equation of "U"-line: Vertical at LL=16 to PI=7, then PI=0.9(LL-8)</p>
		<b>CL</b>		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
<b>OL</b>		Organic silts and organic silty clays of low plasticity					
Silts and clays (Liquid limit greater than 50)		<b>MH</b>	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
		<b>CH</b>	Inorganic clays of medium to high plasticity, organic silts				
		<b>OH</b>	Organic clays of medium to high plasticity, organic silts				
		<b>Pt</b>	Peat and other highly organic soils				

<sup>a</sup>Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 26 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

<sup>b</sup>Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

# APPENDIX C



8248 NW 101st Terr. #5  
Kansas City, MO 64153  
816-599-7965 816-599-7967 Fax

## Compressive Strength Test of Rock Core

Date: 8/12/2020  
Project Name: 3MG ELEVATED WATER TANK  
TSi Project No.: 20201100.00

### COMPRESSIVE STRENGTH DATA

Boring No.	Sample Name	Sample Depth (ft)	Date Tested	Sample Diameter (in)	Sample Length (in)	Moisture, %	Wet Unit Weight (lbs/ft <sup>3</sup> )	Sample Area (sq in)	Load (lbs)	Compressive Strength (psi)	Compressive Strength (ksf)
<b>B-02</b>	C-01	15.5	7/21/20	1.84	4.64	9.0%	138.46	2.65	3,970	1,495	215
<b>B-02</b>	C-02	24.2	7/21/20	1.80	5.06	17.8%	131.36	2.55	615	241	35
<b>B-05</b>	C-01	36.5	7/21/20	1.84	4.67	0.2%	164.66	2.65	15,660	5,899	849
<b>B-05</b>	C-02	50.0	8/12/20	1.85	4.05	0.2%	164.82	2.68	7,760	2,896	417
<b>B-05</b>	C-03	64.4	8/12/20	1.83	3.67	5.8%	151.84	2.64	2,590	983	142

Note:\* Compressive strength of rock cores were determined by trimming samples to 90 degree planes at each end (differs slightly from method described in D4543) and breaking in concrete strength machine per ASTM C39.

# APPENDIX D

B-02

3MG Elevated Water Tank

20201100.00



<u>Run No.</u>	<u>Depth (ft)</u>	<u>Recovery (%)</u>	<u>RQD (%)</u>
1	10.0 to 15.0	60	17
2	15.0 to 20.0	98	69
3	20.0 to 25.0	97	85

B-02

3MG Elevated Water Tank

20201100.00



<u>Run No.</u>	<u>Depth (ft)</u>	<u>Recovery (%)</u>	<u>RQD (%)</u>
3	20.0 to 25.0	100	85

B-04

3MG Elevated Water Tank

20201100.00



Run No.  
1

Depth (ft)  
5.5 to 10.5

Recovery (%)  
45

RQD (%)  
0

B-05

3MG Elevated Water Tank

20201100.00



Run No.  
1  
2  
3

Depth (ft)  
35.0 to 36.0  
36.0 to 40.0  
40.0 to 45.0

Recovery (%)  
100  
100  
100

RQD (%)  
0  
100  
55

B-05

3MG Elevated Water Tank

20201100.00



<u>Run No.</u>	<u>Depth (ft)</u>	<u>Recovery (%)</u>	<u>RQD (%)</u>
4	45.0 to 50.0	100	86
5	50.0 to 55.0	100	57

B-05

3MG Elevated Water Tank

20201100.00



<u>Run No.</u>	<u>Depth (ft)</u>	<u>Recovery (%)</u>	<u>RQD (%)</u>
6	55.0 to 60.0	100	88
7	60.0 to 65.0	98	30

**City of Kansas City, Missouri  
Civil Rights & Equal Opportunity Department  
Construction Contractor Employee Identification Report**

Company Name: \_\_\_\_\_  
 Company Address: \_\_\_\_\_  
 Company City, State, Zip: \_\_\_\_\_

Prime's Name: \_\_\_\_\_  
 KCMO Project Name: \_\_\_\_\_  
 KCMO Project Number: \_\_\_\_\_

Name of Person Completing Report: \_\_\_\_\_  
 Phone Number: \_\_\_\_\_  
 Email: \_\_\_\_\_

Today's Date: \_\_\_\_\_  
 City Department: \_\_\_\_\_

**Instructions:**

- 1) Each applicable Prime Contractors **must complete this form for its company within 48 hours of bid opening**
- 2) The Civil Rights & Equal Opportunity Department strongly recommends usage of the electronic version of this form. This form may be obtained by visiting [www.kcmo.gov](http://www.kcmo.gov) website. The website is enabled with a "search" function on the Home page on the right corner. Select the magnifying glass and type in the search field "Contract Central". Select the first result, then click on the link to Standard City Contract Forms. Scroll down to Construction Contractor Employee Identification Report and click the link to open this document. Complete the fields in the Employee section; the Official Use Only section will automatically populate. NOTE: This form can be printed and attached to other required Bid documents.
- 3) All subcontractors shall be required to complete this form and submit to the Prime Contractor. For each subcontractor, the Prime must submit this form to City at least at least (10) days prior to the date the subcontractor shall commence work under a city construction contract.
- 4) Complete this form if you are the Prime contractor on a City construction project estimated over **\$300,000 & over 800 man hours**.
- 5) Complete this form with data from your **current construction workforce** (no office personnel).
- 6) Prime contractor is responsible to ensure subcontractor completes this form as required in #3 above.

Females		Males		Foreman/Supervisor		Operating Engineer	
KCMO Resident		KCMO Resident		Journeyman	Apprentice	Journeyman	Apprentice
African American	0 0	African American	##### 0	Asbestos Worker	0 0	Painter	0 0
Asian/Pacific Islander American	0 0	Asian/Pacific Islander American	##### 0	Boilermaker	0 0	Pipe Fitter/Plumber	0 0
Caucasian American	0 0	Caucasian American	##### 0	Bricklayer	0 0	Plasterer	0 0
Hispanic/Latino American	0 0	Hispanic/Latino American	##### 0	Carpenter	0 0	Roofer	0 0
Native American	0 0	Native American	##### 0	Cement Mason	0 0	Sheet Metal	0 0
Other	0 0	Other	##### 0	Electrician	0 0	Sprinkler Fitter	0 0
				Elevator Constructor	0 0	Truck Driver	0 0
				Glazier	0 0	Welder	0 0
				Iron Worker	0 0	Other	0 --
				Laborer	0 0		0 0
					0 0		

Number of KCMO Residents	0
Number of Journeyman	0
Number of Apprentice	0

Company Name: 0

KCMO Project Name: 0

KCMO Project Number: 0

	Name		Job Title (use drop down menu)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
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	Name		Job Title <i>(use drop down menu)</i>	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
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	Name		Job Title <i>(use drop down menu)</i>	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
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Company Name: 0

KCMO Project Name: 0

KCMO Project Number: 0

	Name		Job Title <i>(use drop down menu)</i>	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
81										
82										
83										



**ADDENDUM NUMBER 4**Project Number 8000977/9618Project Title Prospect Elevated Water Storage TankISSUE DATE: March 16, 2023

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on **March 21, 2023**, are amended as follows:

**Bidding Requirements**

1. Delete and replace the following Documents:
  - a. Delete Document, 00700 General Conditions to Bid and replace with the attached 00700 Construction General Conditions to Bid.

**Questions from Bidders** The following is provided to respond to Bidders questions:

Q1	Where can bidders locate Form 000485.04 that was attached to Addendum #3.
A1	<b>Form 00485.04 is one of the two downloadable files in the Plan Room website, related to Addendum #3. The second of two downloadable files is Addendum #3 itself.</b>
Q2	Addendum #3 indicates that there is yet another Addendum coming “next week” to clarify the gas line relocation question. Providing this at your earliest is critical as time may be needed to coordinate with Spire Energy or obtain costs from them (dependent upon the direction given in Addendum #4).
A2	<b>Via Addendum #3, questions that could be answered at that time were answered. Costs related to the Spire Energy gas line relocation will be covered by an allowance as indicated in this Addendum #4.</b>
Q3	Addendum #3 indicates that “Bidder’s sealed bids may be manually date stamped and accepted by City staff at the north security desk or the mail room on the east side of the building.” Are there any details beyond the shipping/bid opening address given in Addendum #2 that would ensure FedEx/UPS/etc. will drop off our bid at the right location and to the right person?
A3	<b>The drop off for FedEx and UPS is the mailroom at the address in Addendum #2. If dropping off in person, the bid packages can be date stamped only at the north entrance.</b>
Q4	On drawing C004, can valve No. 5 be moved approximately 50’ to the west and installed next to the 24” cross?
A4	<b>The 24” Butterfly valve shown at Point #5 on Drawing C004 may be relocated closer to the cross but not directly adjacent/next to the cross due to valve and disc clearance concerns. Contractors should carefully read Note 2 on Drawing C004, and Notes 18, 19, 20, and 21 on Drawing C001 regarding sewer clearance and water main requirements.</b>

Q5	The P&ID drawings and control diagrams related to the altitude valve still show two solenoid valves but one of these solenoid valves were removed in Addendum #3. Please clarify.
A5	<b>The controls are intended to function similar to an altitude valve with two solenoid valves but it will not be required to position the valve intermittently over its entire operating range other than either open or closed.</b>
Q6	Can the altitude valve body be cast iron and can it be reduced port?
A6	<b>Yes, the altitude valve body may be either ductile iron or cast iron and the 30-inch altitude valve may have a reduced port of no less than 24-inches.</b>
Q7	I saw the advertisement for bid on the Prospect tank. Is this a construction only or a demolition?
A7	<b>This is new construction refer to plans and specifications for contract requirements</b>

Specifications:

1. Delete and replace Section 00410 with the attached version that incorporates an allowance.
2. Add Allowance Form 00413.

**NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the Bid Form - Document 00410.**

CITY OF FOUNTAINS  
HEART OF THE NATION



KANSAS CITY  
MISSOURI

### BID FORM/CONTRACT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

1. Bidder, having examined the Bidding Documents, related documents and the Site of the Work, and being familiar with all the conditions affecting the construction of the proposed Work, including Laws and Regulations and the availability of materials and supplies, agrees, if this Bid is selected by CITY, this Bid Form/Contract will become the Contract between Bidder and CITY for Bidder to furnish all labor and materials, equipment and services necessary for the proper completion of the Work in accordance with the Contract Documents, including general construction work at the price(s) stated below, which stated sums include fees and all other charges applicable to materials, appliances, labor and all things subject to and upon which other charges may be levied.
2. Bidder agrees the Contract Documents will comprise the entire agreement between CITY and Bidder. The Contract Documents are identified in the General Conditions and are incorporated into and made part hereof this Bid Form/Contract by reference.
3. Bidder agrees that if this Bid Form/Contract is executed by CITY, Bidder's offer is accepted and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the parties. Bidder authorizes the CITY to fill in the Contract Price on this Bid Form/Contract in accordance with Bidder's Bid. Bidder agrees that this Bid Form/Contract may be executed in one or more counterparts, each of which will be deemed an original copy of this Bid Form/Contract and all of which, when taken together, will be deemed to constitute one and the same Bid Form/Contract. This Bid Form/Contract shall be effective upon the execution of counterparts by both parties, notwithstanding that both parties may not sign the same counterpart. The parties' signatures transmitted by facsimile or by other electronic means shall be proof of the execution of this Bid Form/Contract and shall be acceptable in a court of law. A copy of this Bid Form/Contract shall constitute an original and shall be acceptable in a court of law.
4. The Bid Price(s) shall be shown in numeric figures only.

**I. TOTAL LUMP SUM BID IN NUMERIC FIGURES FOR ALL WORK REQUIRED BY THE CONTRACT DOCUMENTS**

\$ \_\_\_\_\_

**II. ALLOWANCE (FORM 00413)**

\$ 50,000.00

**III. TOTAL BID IN NUMERIC FIGURES (SUM OF I AND II)**

\$ \_\_\_\_\_

5. The undersigned Bidder has given CITY'S Project Manager written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by the Project Manager or by the DESIGN PROFESSIONAL is acceptable to Bidder.

Bidder: \_\_\_\_\_

- 6. The undersigned Bidder agrees that this Bid shall remain subject to selection by CITY, and may not be withdrawn for ninety (90) days after the day Bids are opened.
- 7. *Form* 00413 Allowances contain prices included in the Base Bid, and is incorporated into this Bid. Form(s) must be completed and returned with this Bid.
- 8. The undersigned Bidder acknowledges receipt of the following addenda listed by number and date appearing on each addendum:

Addendum Number	Dated	Addendum Number	Dated
(_____)	(_____)	(_____)	(_____)
(_____)	(_____)	(_____)	(_____)
(_____)	(_____)	(_____)	(_____)

- 9. By submitting its bid, Bidder is agreeing to meet or exceed the minimum employment goals of 10% minority and 2% women during the term of its contract with the City, or request a waiver of the goals. If a waiver is requested, Bidder must establish good faith efforts towards meeting the goals as set forth in the CREO KC Instructions for Construction Contracts and the City’s Construction Employment Program Ordinance (commonly known as the “Workforce Ordinance”) (City Code Sections 3-421, and 3-469, and 3-515). Within forty-eight (48) hours after bid opening, the construction contractor shall submit **00485.04 CREO KC Construction Employee Identification Report Form - Rev. 10122022** which shall include: the name, home address, job title, sex and race/ethnicity of each person the contractor anticipates will be performing construction labor hours creditable towards the minimum workforce goals applicable to the construction contractor individually.
- 10. Should Bidder fail to meet or exceed the minimum employment goals or otherwise establish that Bidder is entitled to a waiver under circumstances in which Bidder has previously failed to meet or exceed the goals on one or more occasions with the twenty-four month period immediately preceding the completion of the Work under this Bid Form/Contract, Bidder may be suspended from participating, either as a contractor or subcontractor, on any future contract with the City for a period ranging from thirty days to six months as further specified in the Contract Documents. This program is distinguished from the M/WBE Program in that it is not based on company ownership but rather is based on workforce hours instead of a budgetary allocation of work.
- 11. By submitting its bid, Bidder warrants that if its bid should exceed \$300,000.00 and Bidder employs fifty (50) or more people, Bidder has an affirmative action program in place and will maintain the affirmative action program in place for the duration of its contract with the City. Bidder further warrants that it will comply with the affirmative action requirements contained in the General Conditions as incorporated by reference into this Bid Form/Contract.
- 12. Section 15 through Section 18 constitutes the Affidavit of Intended Utilization required to be submitted by Bidders.
- 13. By submitting its bid, Bidder is agreeing to the following: (1) Bidder has made by bid opening a good faith effort to meet the MBE/WBE/DBE goals established for the project; or Bidder will continue to make during the 48 hours after bid opening a good faith effort to meet the MBE/WBE/DBE goals established for the project; and (2) Bidder will timely submit its **00450 CREO KC Form 8 Contractor Utilization Plan/Request for Waiver** and **CREO KC Form 00450.01 Letter of Intent to Subcontract** for each MBE/WBE listed on the 00450 CREO KC Form 8 Construction Contractor Utilization Plan/Request for Waiver;; and (3) Bidder will submit documentation of its good faith efforts to meet the MBE/WBE/DBE goals when requested by the City. Failure to meet these requirements in good faith will result in Bidder forfeiting its bid bond.

Bidder: \_\_\_\_\_

**PROJECT GOALS:**                      7   % MBE      4   % WBE    \_\_\_\_\_ % DBE

**BIDDER PARTICIPATION:**            \_\_\_\_\_ % MBE    \_\_\_\_\_ % WBE    \_\_\_\_\_ % DBE

14. To the best of Bidder’s knowledge, the following are names of certified MBEs and/or WBEs with whom Bidder, or Bidder’s subcontractors, presently intend to contract with if awarded the Contract on the above project: **(All firms must currently be certified by Kansas City, Missouri Human Relations Department)**

A.     Name of M/WBE Firm \_\_\_\_\_  
       Address \_\_\_\_\_  
       Telephone No. \_\_\_\_\_  
       I.R.S. No. \_\_\_\_\_  
       Area/Scope of work \_\_\_\_\_  
       Subcontract amount \_\_\_\_\_

B.     Name of M/WBE Firm \_\_\_\_\_  
       Address \_\_\_\_\_  
       Telephone No. \_\_\_\_\_  
       I.R.S. No. \_\_\_\_\_  
       Area/Scope of work \_\_\_\_\_  
       Subcontract amount \_\_\_\_\_

C.     Name of M/WBE Firm \_\_\_\_\_  
       Address \_\_\_\_\_  
       Telephone No. \_\_\_\_\_  
       I.R.S. No. \_\_\_\_\_  
       Area/Scope of work \_\_\_\_\_  
       Subcontract amount \_\_\_\_\_

D.     Name of M/WBE Firm \_\_\_\_\_  
       Address \_\_\_\_\_  
       Telephone No. \_\_\_\_\_  
       I.R.S. No. \_\_\_\_\_  
       Area/Scope of work \_\_\_\_\_  
       Subcontract amount \_\_\_\_\_

E.     Name of M/WBE Firm \_\_\_\_\_  
       Address \_\_\_\_\_  
       Telephone No. \_\_\_\_\_  
       I.R.S. No. \_\_\_\_\_  
       Area/Scope of work \_\_\_\_\_  
       Subcontract amount \_\_\_\_\_

*(List additional MBE/WBEs, if any, on additional pages and attach to this form)*

15. By submitting its bid, Bidder is agreeing it will identify and timely submit within 48 Hours after Bid opening those MBE/WBE subcontractors with dollar amounts and scopes of work, which apply to or exceed the MBE/WBE goals for the Project on the **00450 CREO KC Form 8 Contractor Utilization Plan/Request for Waiver**.

16. Bidder agrees that failure to meet or exceed the MBE/WBE Goals for the above project will require the Director of Human Relations to recommend disapproval of the bid unless the Director of Human

Bidder: \_\_\_\_\_

Relations finds the Bidder established good faith efforts towards meeting the goals as set forth in the CREO KC Forms and Instructions for Construction Projects and the City's MBE/WBE Ordinance.

17. Business Entity Type:

- Missouri Corporation
- Foreign Corporation
- Fictitious Name Registration
- Sole Proprietor
- Limited Liability Company
- Partnership
- Joint Venture
- Other: (Specify) \_\_\_\_\_

**BIDDER**

Legal name & address of Bidder, person firm, partnership, corporation, or association submitting Bid:

Phone No: \_\_\_\_\_

Cell No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

Bidder's E-Mail: \_\_\_\_\_

Federal ID. No. \_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Bidder, person, firm, partnership, corporation or association submitting Bid.

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name)

Title: \_\_\_\_\_

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

(Attach corporate seal if applicable)

**NOTARY**

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

My Commission Expires: \_\_\_\_\_

Bidder: \_\_\_\_\_

**ACCEPTANCE OF BID**

CITY, by executing this Bid Form/Contract, hereby accepts Bidder's Bid and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the Parties.

CITY shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents a maximum amount of \_\_\_\_\_ Dollars, (\$ \_\_\_\_\_ ). The Contract Price includes:

00413 Allowances, included in the Bid, a copy of which is attached

By executing this Bid Form/Contract, CITY accepts Bidder's offer for the Contract Price stated above and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the parties

\_\_\_\_\_  
City of Kansas City, Missouri (OWNER or City)

Approved as to form:

\_\_\_\_\_  
Assistant City Attorney

I hereby certify that there is a balance, otherwise unencumbered, to the credit of the appropriation to which the foregoing expenditure is to be charged, and a cash balance, otherwise unencumbered, in the treasury, to the credit of the fund from which payment is to be made, each sufficient to meet the obligation hereby incurred.

\_\_\_\_\_  
Director of Finance

(Date)





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## ARTICLE 1 DEFINITIONS AND TERMINOLOGY

### 1.01 Defined Terms

A. Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

**1. Addenda** - Written or graphic instruments issued prior to the opening of Bids that clarify, correct or change the Bidding Requirements or the Contract Documents.

**2. Agreement**—The written Contract between CITY and CONTRACTOR governing the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

**3. Application for Payment**—The form accepted by CITY's Representative which is to be used by CONTRACTOR in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

**4. Asbestos** - Any material that contains more than one percent (1%) Asbestos and is friable or is releasing Asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

**5. Bid**- The offer or proposal of the Bidder submitted on the Bid Form/Contract setting forth the prices for the Work to be performed. A Bidder's Bid becomes a Contract with CITY if the CITY executes the Bid Form/Contract submitted by Bidder. If the CITY executes the Bid Form/Contract submitted by Bidder, the term "Bidder" shall mean CONTRACTOR.

**6. Bidder**- One who submits a Bid directly to CITY, as distinct from a sub-bidder who submits a bid to a Bidder. If the CITY executes the Bid Form/Contract submitted by Bidder, the term "Bidder" shall mean CONTRACTOR in both the Bidding Documents and Contract Documents unless the context clearly indicates otherwise.

**7. Bidding Documents**- The advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form/Contract, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

**8. Bidding Requirements**- The advertisement or invitation to bid, Instructions to Bidders, Bid security, and the Bid Form/Contract with any supplements.

**9. Bonds**- Payment Bond and Performance and Maintenance Bond and other instruments of security.

**10. Calendar Day**- Any day shown on the calendar, including Saturdays, Sundays, and holidays.

**11. Change Order**- A written document issued by CITY that authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Contract.

**12. CITY/OWNER**- Kansas City, Missouri, a constitutionally chartered municipal corporation, with which CONTRACTOR has entered into the Contract and for whom the Work is to be provided.

**13. CITY's Representative**- Person or agency designated to act for the Director as provided in these Contract Documents.

**14. Consultant**- Person, firm or corporation having a contract with CITY or DESIGN PROFESSIONAL to furnish services as an independent professional associate or Consultant with respect to the Project and who's identified as such in the Supplementary Conditions.

The Consultant(s) is identified and their seals affixed on the Certification Page(s). The certifications describe the respective responsibilities for the Drawings and Specifications prepared by the Consultant(s) and are incorporated into this Contract.

**15. Contract-** The entire and integrated written agreement between CITY and CONTRACTOR concerning the Work that incorporates all Contract Documents. The Bid Form/Contract submitted by Bidder is the Contract between CITY and CONTRACTOR upon execution by CITY. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

**16. Contract Documents-** The Contract Documents establish the rights and obligations of the parties and include the Contract, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid Form/Contract (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Intent to Contract), the Construction Project Instructions, the Contractor's Utilization Plan/Request for Waiver, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Project Manual and the certification page(s) of the DESIGN PROFESSIONAL and Consultant(s), together with approved project baseline schedule and amendments thereto and all Written Amendments, Change Orders, Work Change Directives, and DESIGN PROFESSIONAL's written interpretations and clarifications issued on or after the Effective Date of the Contract, and approved Shop Drawings. Reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this Paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by CITY to CONTRACTOR are not Contract Documents, except project schedules submitted by CONTRACTOR and approved by CITY.

**17. Contract Price-** The money payable by CITY to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement.

**18. Contract Times-** The number of days or the dates stated in the Supplementary Conditions: (a) to achieve Substantial Completion, and (b) to complete the Work so that it is ready for final payment as evidenced by CITY's Representative's written recommendation of final payment.

**19. CONTRACTOR-** The person, firm, partnership, company, corporation or association licensed or otherwise authorized by law to do business in Missouri, with whom CITY has entered into the Agreement.

**20. Day-** Shall constitute a Calendar Day.

**21. DESIGN PROFESSIONAL-** Architect, Engineer or other licensed professional who is either employed by or has contracted with CITY to serve in a design capacity and whose Consultants, members, partners, employees or agents have prepared and sealed the Drawings and Specifications.

The DESIGN PROFESSIONAL(s) is identified and their seals affixed on the Certification Page(s). The certifications describe the respective responsibilities for the Drawings and Specifications prepared by the DESIGN PROFESSIONAL and are incorporated into this Contract.

**22. DESIGN PROFESSIONAL's Project Representative-** The authorized representative of DESIGN PROFESSIONAL who may be assigned to the Site or any part thereof.

**23. Director-** The term Director shall mean the duly appointed executive officer of a department of City who is empowered by the City Charter or by the City Council to enter into a contract on behalf of City, or to grant a permit for improvements to land owned by City. A Director is authorized to delegate this authority to a City employee so designated in writing.

**24. Drawings-** The drawings which graphically show the scope, extent and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared by DESIGN PROFESSIONAL and are included in the Contract Documents. Shop Drawings are not Drawings as so defined.

**25. Effective Date of the Contract-** The date indicated in the Contract on which it becomes effective, but if no such date is indicated it means the date on which the Contract is fully executed by CITY.

**26. General Requirements-** Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

**27. Hazardous Environmental Condition-** The presence at the Site of Asbestos, Lead-Based Paint, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

**28. Hazardous Waste-** The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

**29. Laws or Regulations-** Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

**30. Lead-Based Paint-** Any paint, varnish, stain, or other applied coating that has one (1) mg or more of lead per square centimeter. The terms "leaded paint" and "lead-containing paint" are synonymous with Lead-Based Paint.

**31. Liens-** Liens, charges, security interests or encumbrances upon real property or personal property.

**32. Milestone-** A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

**33. Notice of Intent to Contract-** The written notice by CITY to the apparent successful Bidder stating that upon compliance by that apparent successful Bidder with the conditions in the Bid Documents enumerated, within the time specified, and upon enactment of an appropriate ordinance or resolution, CITY will sign and deliver the Contract.

**34. Notice to Proceed-** A written notice given by CITY to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.

**35. Partial Utilization-** Use by CITY of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

**36. PCBs-** Polychlorinated biphenyls.

**37. Petroleum-** Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

**38. Project-** The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

**39. Project Manual-** The documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual may be issued in one or more volumes and is contained in the table(s) of contents.

**40. Radioactive Material-** Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

**41. Samples-** Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

**42. Shop Drawings-** All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

**43. Site-** Lands or areas indicated in the Contract Documents as being furnished by CITY upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by CITY which are designated for the use of CONTRACTOR.

**44. Specifications-** Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

**45. Subcontractor-** Any individual, firm, partnership, company, corporation or association licensed or otherwise authorized by law to do business in Missouri, to whom CONTRACTOR, with written notification to CITY, has entered into an agreement to perform a part of the Work.

**46. Substantial Completion-** When Work (or a specified part thereof) has progressed to the point where, in the opinion of DESIGN PROFESSIONAL as evidenced by DESIGN PROFESSIONAL's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

**47. Supplementary Conditions-** The part of the Contract Documents which amends and/or supplements these General Conditions.

**48. Supplier-** A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated into the Work by CONTRACTOR or any Subcontractor.

**49. Underground Facilities-** All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

**50. Unit Price Work-** Work to be paid for on the basis of unit prices.

**51. Work-** The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor, and furnishing and incorporating material and equipment into the construction, and furnishing documents, all as required by the Contract Documents.

**52. Work Change Directive-** A written directive to CONTRACTOR, issued on or after the Effective Date of the Contract, signed by CITY and recommended by DESIGN PROFESSIONAL, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed, or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or

documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

**53. Work Day** - Any day during which the CONTRACTOR is able to work a period of six (6) hours or more. Days that are not Work Days are days during which the CONTRACTOR is unable to work for a period of six (6) hours by reason of strikes, boycotts, labor disputes, embargoes, unusual delays in transportation or shortage of material, acts of God, acts of the public enemy, acts of superior governmental authority, weather conditions, riots, rebellion, sabotage, or any other circumstances for which CONTRACTOR is not responsible or which is not within its control. Saturdays, Sundays, and holidays on which the CONTRACTOR's forces engage in Work requiring the presence of an inspector, will be considered as Work Days.

**54. Written Amendment-** A written statement modifying the Contract Documents, signed by CITY and CONTRACTOR on or after the Effective Date of the Contract and normally dealing with the non-engineering or non-technical rather than strictly construction-related aspects of the Contract Documents.

## **1.02 Terminology**

### **A. Intent of Certain Terms or Adjectives**

1. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of DESIGN PROFESSIONAL as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to DESIGN PROFESSIONAL any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.08 or any other provision of the Contract Documents.

### **B. Defective**

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to CITY 's Representative's recommendation of final payment (unless responsibility for the protection thereof has been assumed by CITY at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

### **C. Furnish, Install, Perform, Provide**

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, “provide” is implied.

D. Unless stated otherwise in the Contract Documents, words and phrases which have a well-known technical or construction industry or trade meanings are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 PRELIMINARY MATTERS**

### **2.01 Delivery of Bonds**

A. CONTRACTOR shall deliver to CITY such Bonds as CONTRACTOR may be required to furnish.

### **2.02 Evidence of Insurance**

A. CONTRACTOR shall deliver to CITY certificates of insurance or other evidence of insurance that CITY may request, which CONTRACTOR is required to purchase and maintain in accordance with Article 5 or any other applicable provision in the Contract Documents.

### **2.03 Copies of Documents**

A. CITY shall furnish to CONTRACTOR one (1) copy of the Drawings and Specifications, including addenda.

### **2.04 Commencement of Contract Times; Notice to Proceed**

A. The Contract Times will commence to run on the date indicated in the Notice to Proceed.

### **2.05 Starting the Work**

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the Site prior to the date on which the Contract Times commence to run, unless otherwise indicated in the Notice to Proceed.

### **2.06 Before Starting Construction**

A. CONTRACTOR's Review of Contract Documents: Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to DESIGN PROFESSIONAL any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from DESIGN PROFESSIONAL before proceeding with any Work affected thereby. CONTRACTOR shall not be liable to CITY or DESIGN PROFESSIONAL for failure to report any conflict, error, ambiguity or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

B. Preliminary Schedules: Within ten (10) days after the Effective Date of the Contract, or on such later date as CITY's Representative shall provide in writing, CONTRACTOR shall submit to CITY's Representative for review:

1. Preliminary Project Schedule: CONTRACTOR shall submit a proposed project schedule for CITY's acceptance. The proposed project schedule shall include a detailed and comprehensive construction schedule utilizing a critical path method diagram network that (a) shows all major procurement and construction elements and phases of the Project; (b) breaks down each element or phase by trade; (c) shows early and late starts so that all float time will be accurately identified; (d) all other activities necessary for the timely completion of the Project in accordance with the scheduled dates for Substantial and Final Completion; and (e) highlights the project's critical path. CITY's acceptance is expressly limited to CITY's acknowledgement that, based upon CITY's limited review, the dates of Substantial

Completion and Milestone dates are acceptable. After final acceptance of the preliminary project schedule by the CITY, it shall be considered the project baseline schedule pursuant to Paragraph 2.07(B).

2. Preliminary schedule of Shop Drawings and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal; and

3. Preliminary 01290.02 Schedule of Values for all of the Work which will include quantities and prices of items which when added together equals the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

**C.** Preconstruction Conference: Before any Work at the Site may be started, a conference attended by CONTRACTOR, DESIGN PROFESSIONAL and others, as appropriate, will be scheduled by CITY's Representative to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.06 B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, maintaining required records, Claims process, dispute resolution or any other applicable provisions of the Contract Documents.

## **2.07 Acceptable Schedules**

**A.** Acceptable schedule: The Contractor shall update and submit to the CITY for review the preliminary schedule within seven (7) Calendar Days after the Notice to Proceed.

1. The CITY shall review and make any necessary comments and/or adjustments to the updated preliminary schedule. The Contractor shall incorporate the CITY's comments and resubmit the updated preliminary schedule within seven (7) Calendar Days from receipt of the CITY's comments.

**B.** Project Baseline Schedule: The accepted updated preliminary schedule shall be considered the project baseline schedule and shall be used by the CONTRACTOR for planning, scheduling, managing, and executing the Work. The project baseline schedule shall not be changed without the written consent of CITY. The project baseline schedule may be further modified by the Supplemental Conditions.

**C.** CONTRACTOR's schedule of values will be acceptable to CITY's Representative as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

## **ARTICLE 3 CONTRACT DOCUMENTS : INTENT, AMENDING, REUSE**

### **3.01 Intent**

**A.** The Contract Documents comprise the entire Contract between CITY and CONTRACTOR concerning the Work.

**B.** It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for at no additional cost to CITY. Clarifications and interpretations of the Contract Documents shall be issued by DESIGN PROFESSIONAL as provided in Paragraph 9.03.

**C.** Correlation and intent of documents: The Drawings and Specifications are intended to supplement each other. Any Work shown on the Drawings and not mentioned in the Specifications (or vice versa) shall be as binding and shall be completed the same as if mentioned or shown on both. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. Change Orders and Written Amendments
2. Project Baseline Schedule Requirements
3. Approved Shop Drawings
4. Addenda, with those of later date having precedence over those of earlier date
5. The Supplementary Conditions
6. The General Conditions
7. Drawings and Specifications

**D.** In the case of an inconsistency between Drawings and Specifications, the requirements of the Specifications shall govern. If Drawings are in conflict, larger scale details shall govern over smaller or no-scale Drawings. If Specification sections are in conflict with each other, the conflict shall be resolved by DESIGN PROFESSIONAL in accordance with reasonable interpretation of such documents.

**E.** The general character of the detailed Work is shown on the Drawings, but minor modifications may be made in the full size or scale details. Where the word "similar" occurs on the Drawings, it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to the other parts of the Work. Where on any Drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the Work. Where ornaments or other details are indicated by starting only, such details shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts in the Work, unless otherwise indicated.

### **3.02 Reference to Standards and Specifications of Technical Societies**

**A.** Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or on the date of CONTRACTOR's proposal if there are no Bids), except as may be otherwise specifically stated in the Contract Documents.

1. No provision of any such standard, specification, manual, code or instruction of Supplier shall be effective to change the duties or responsibilities of CITY, CONTRACTOR or DESIGN PROFESSIONAL, or any of their Subcontractors, Consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to CITY or DESIGN PROFESSIONAL or any of their Consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### **3.03 Reporting and Resolving Discrepancies**

**A. Reporting Discrepancies:** If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Laws or Regulations applicable to the performance of the Work or of any standard, specification, manual, code or any instruction of any Supplier referred to in Paragraph 6.07, CONTRACTOR shall report it immediately to DESIGN PROFESSIONAL in writing. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as authorized by Paragraph 6.17) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to CITY or DESIGN PROFESSIONAL for failure to report any such conflict, error, ambiguity or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

**B. Resolving Discrepancies.** The provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

1. the provisions of any standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
2. the provisions of any Laws or Regulations applicable to the performance of the Work.

### **3.04 Amending and Supplementing Contract Documents**

**A.** The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

1. a Written Amendment or
2. a Change Order (pursuant to Article 10), whether pursuant to a Work Change Directive or otherwise.

**B.** The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized, in one or more of the following ways

1. DESIGN PROFESSIONAL's approval of a Shop Drawing or Sample (pursuant to Paragraph 6.18), or
2. DESIGN PROFESSIONAL's written interpretation or clarification (pursuant to Paragraph 9.03).

### **3.05 Reuse of Documents**

**A.** CONTRACTOR and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under this Contract:

1. shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of DESIGN PROFESSIONAL or Consultant, and
2. shall not reuse any of such Drawings, Specifications, other documents or copies thereof on extensions of the Project or any other project without written consent of CITY, and of DESIGN PROFESSIONAL or Consultant, as applicable, and specific written verification or adaptation by DESIGN PROFESSIONAL or Consultant.

This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS**

### **4.01 Availability of Lands**

**A.** CITY shall furnish the Site. CITY shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which CONTRACTOR will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by CITY, unless otherwise provided in the Contract Documents. If CONTRACTOR and CITY are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times or both as a result of any delay in CITY's furnishing these lands, rights-of-way or easements, CONTRACTOR may make a Claim as provided in Article 16. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

## 4.02 Subsurface and Physical Conditions

**A. Reports and Drawings:** Reference is made to the Supplementary Conditions for identification of:

1. Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by DESIGN PROFESSIONAL in preparing the Contract Documents; and
2. Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that have been utilized by DESIGN PROFESSIONAL in preparing the Contract Documents.

**B. Limited Reliance by CONTRACTOR on Technical Data Authorized:** CONTRACTOR may rely upon the general accuracy of the technical data contained in reports and drawings of subsurface or physical conditions, but such reports and drawings are not Contract Documents. The technical data is identified in the Supplementary Conditions. Except for reliance on such technical data, CONTRACTOR may not rely upon or make any Claim against CITY, DESIGN PROFESSIONAL or any Consultant with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or
3. any CONTRACTOR interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions or information.

## 4.03 Differing Subsurface or Physical Conditions

**A. Notice of Differing Subsurface or Physical Conditions.** If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any technical data on which CONTRACTOR is entitled to rely as provided in Paragraphs 4.02 A and 4.02 B is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.17), notify CITY and DESIGN PROFESSIONAL in writing about such condition(s). CONTRACTOR shall not further disturb such conditions or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

**B. DESIGN PROFESSIONAL's Review:** After receipt of notice as required by Paragraph 4.03 A, DESIGN PROFESSIONAL will promptly review the pertinent conditions, determine the necessity for CITY to obtain additional exploration or tests with respect thereto and notify CITY in writing (with a copy to CONTRACTOR) of DESIGN PROFESSIONAL's findings and conclusions.

**C. Possible Contract Documents Change:** If CITY concludes that a change in the Contract Documents is required as a result of a condition that meets one or more of the categories in Paragraph 4.03 A, a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

**D. Possible Price or Times Adjustments:** An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of a subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

1. the condition must meet any one or more of the categories described in Paragraphs 4.03 A.1 through 4.03 A.4, inclusive;
2. a change in the Contract Documents pursuant to Paragraph 4.03 C will not be an automatic authorization of, nor a condition precedent to, entitlement to any such adjustments;
3. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.06 and 11.04; and
4. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if;
  - a. CONTRACTOR knew, or by the exercise of ordinary care could have known, of such conditions at the time CONTRACTOR made a final commitment to CITY with respect to Contract Price and Contract Times by the submission of a Bid; or
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or
  - c. CONTRACTOR failed to give the written notice as required by Paragraph 4.03 A.

**E.** If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price pursuant to Article 11 and/or Contract Times pursuant to Article 12, a Claim may be made therefore as provided in Article 16. However, CITY, DESIGN PROFESSIONAL and Consultants shall not be liable to CONTRACTOR for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

#### **4.04. Physical Conditions – Underground Facilities**

**A. Shown or Indicated:** The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to CITY or DESIGN PROFESSIONAL by the owners of such Underground Facilities or by others.

1. CITY and DESIGN PROFESSIONAL shall not be responsible for the accuracy or completeness of any such information or data; and
2. The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for:
  - a. reviewing and checking all such information and data,
  - b. locating all Underground Facilities shown or indicated in the Contract Documents,
  - c. coordination of the Work with the owners of such Underground Facilities during construction, and
  - d. the safety and protection of all such Underground Facilities as provided in Paragraph 6.14 and repairing any damage thereto resulting from the Work.

**B. Not Shown or Indicated:** If an Underground Facility is uncovered or revealed at or contiguous to the Site, and was not shown or indicated in the Contract Documents, or was

shown or indicated incorrectly in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.17), identify the owner of such Underground Facility and give written notice to that owner and to CITY and DESIGN PROFESSIONAL.

**C. DESIGN PROFESSIONAL's Review:** After receipt of notice as required by Paragraph 4.04 B, DESIGN PROFESSIONAL will promptly review the consequences of the existence of the Underground Facility and notify CITY in writing (with a copy to CONTRACTOR) of DESIGN PROFESSIONAL's findings and conclusions.

**D. Possible Contract Documents Change:** If CITY concludes that a change in the Contract Documents is required as a result of the existence of an Underground Facility that either was not shown, or was shown incorrectly, in the Contract Documents, a Work Change Directive or Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

**E. Possible Price or Times Adjustments:** An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of the Underground Facility causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

1. a change in the Contract documents pursuant to Paragraph 4.04 D will not be an automatic authorization of, nor a condition precedent to, entitlement to any such adjustments;
2. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.06 and 11.04; and
3. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if;
  - a. CONTRACTOR knew, or by the exercise of ordinary care could have known, of the existence of the Underground Facility at the time CONTRACTOR made a final commitment to CITY with respect to Contract Price and Contract Times by the submission of a Bid; or
  - b. the existence of the Underground Facility could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or
  - c. CONTRACTOR failed to give the written notice as required by Paragraph 4.04 B.

**F.** If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price pursuant to Article 11 and/or Contract Times pursuant Article 12, a Claim may be made therefore as provided in Article 16. However, CITY, DESIGN PROFESSIONAL and Consultants shall not be liable to CONTRACTOR for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

#### **4.05 Reference Points**

**A.** CITY shall provide engineering surveys to establish reference points for construction that in DESIGN PROFESSIONAL's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of CITY. CONTRACTOR shall report to DESIGN PROFESSIONAL whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be

responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

#### **4.06 Asbestos, Lead-Based Paint, PCBs, Petroleum, Hazardous Waste or Radioactive Material**

**A. Reports and Drawings:** Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the DESIGN PROFESSIONAL in the preparation of the Contract Documents.

**B. Limited Reliance by CONTRACTOR on Technical Data Authorized:** CONTRACTOR may rely upon the general accuracy of the technical data contained in reports and drawings relating to a Hazardous Environmental Condition at the Site, but such reports and drawings are not Contract Documents. Such technical data is identified in the Supplementary Conditions. Except for such reliance on such technical data, CONTRACTOR may not rely upon or make any Claim against CITY, DESIGN PROFESSIONAL or any Consultant with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions or information.

**C.** CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for all Hazardous Environmental Conditions created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible. CONTRACTOR shall not be entitled to an extension of the Contract Times or an increase in the Contract Price if CONTRACTOR, Subcontractor, Supplier or anyone for whom CONTRACTOR is responsible created any Hazardous Environmental Condition at the Site or in connection with the Work.

**D.** If CONTRACTOR encounters a Hazardous Environmental Condition at the Site or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition at the Site, CONTRACTOR shall immediately:

1. secure or otherwise isolate such condition;
2. stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6. 15); and
3. notify CITY and DESIGN PROFESSIONAL (and promptly thereafter confirm such notice in writing). CITY shall promptly consult with DESIGN PROFESSIONAL concerning the necessity for CITY to retain a qualified expert to evaluate such condition or take corrective action, if any.

**E.** CONTRACTOR shall neither resume Work nor be required to resume Work in connection with such condition or in any affected area until after CITY has obtained any required permits related thereto and delivered to CONTRACTOR written notice:

1. specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or
2. specifying any special conditions under which such Work may be resumed safely. If CITY and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price pursuant to Article 11 and/or Contract Times to

pursuant to Article 12 as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, a Claim may be made therefore as provided in Article 16.

**F.** If after receipt of written notice as required in Paragraph 4.06 E, CONTRACTOR does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under special conditions specified in the notice, then CITY may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If CITY and CONTRACTOR cannot agree as to entitlement to or magnitude of an equitable adjustment in Contract Price pursuant to Article 11 and/or Contract Times pursuant to Article 12 as a result of deleting such portion of the Work, then a Claim may be made therefore as provided in Article 16. CITY may have such deleted portion of the Work performed by CITY's own forces or others in accordance with Article 7.

**G.** The provisions of Paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

**H.** All materials used, whether new or salvaged, shall be asbestos-free materials. CONTRACTOR shall immediately call to the attention of the CITY's Representative any specified material or product which the CONTRACTOR knows or suspects to contain asbestos, whether new or salvaged.

## **ARTICLE 5 BONDS AND INSURANCE**

### **5.01 Performance, Payment and Other Bonds**

**A.** CONTRACTOR shall furnish Performance and Maintenance and Payment Bonds, each in an amount at least equal to the Contract Price, as set out in the Contract Documents, as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one (1) year after the date when final payment of the Contract becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions.

**B.** All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations. A certified copy of the agent's authority to act must accompany all Bonds signed by an agent.

**C.** If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirement of Paragraph 5.01 B, CONTRACTOR shall within twenty (20) days thereafter substitute another Bond and surety, both of which must be acceptable to CITY.

### **5.02 Licensed Sureties and Insurers**

**A.** All Bonds and insurance required by the Contract Documents to be purchased and maintained by CITY or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed in the State of Missouri and in the jurisdiction in which the Project is located, if not in Missouri, to issue Bonds or insurance policies for the limits and coverages so required. All surety and insurance companies shall hold an A.M. Best rating of A-, V, or better.

### **5.03 Certificates of Insurance**

**A.** CONTRACTOR shall deliver to CITY and DESIGN PROFESSIONAL, prior to the start of any Work at the Project Site, properly completed certificates of insurance or other evidence that the required insurance is in full force and effect, in a form acceptable to CITY. The receipt or acceptance of a certificate of insurance that does not incorporate the required terms and coverage shall not constitute a waiver by the City of the insurance requirements contained in the Contract Documents.

**B.** All policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained by CONTRACTOR in accordance with Paragraphs 5.04 and 5.06 will contain waiver provisions in accordance with Paragraph 5.07 A. The certificates of insurance will contain a provision stating that should any of the policies described in the certificate be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

**C.** If the coverage afforded is cancelled or changed or its renewal is refused, CONTRACTOR shall give at least thirty (30) days prior written notice to CITY and to each other additional insured to whom a certificate of insurance has been issued.

#### **5.04 CONTRACTOR's Liability Insurance**

**A.** CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and furnished, and will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;
4. claims for damages insured by customary personal injury liability coverage;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefore; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

**B.** The policies of insurance so required by Paragraph 5.04 A, to be purchased and maintained shall:

1. with respect to insurance required by Paragraphs 5.04 A.3 through 5.04 A.5 inclusive, include as additional insureds (subject to any customary exclusion for professional liability) CITY, DESIGN PROFESSIONAL, Consultants and any other individuals or entities identified in the Supplementary Conditions to be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in Paragraph 5.04 C or required by Laws or Regulations, whichever is greater;
3. include completed operations insurance;
4. include contractual liability insurance covering CONTRACTOR's indemnity obligations;
5. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing defective Work in accordance with Paragraphs 13.06 and 13.07;

6. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two (2) years after final payment (and CONTRACTOR shall furnish CITY and each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued evidence satisfactory to CITY and any such additional insured of continuation of such insurance);

7. contain a cross-liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance;

8. with respect to commercial automobile liability, commercial general liability, and umbrella liability insurance, CONTRACTOR shall require its insurance carrier(s) to waive all rights of subrogation against CITY, and CITY's officers, directors, partners, employees and agents; and

9. contain a provision or endorsement that the costs of providing the insureds a defense and appeal, including attorneys' fees, as insureds, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's responsibility.

**C.** Specific policies of insurance required by this Paragraph 5.04 shall include:

1. Workers' Compensation and Employers' Liability Insurance. This insurance shall protect CONTRACTOR against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of workers' compensation laws. This policy shall include an "all states" or "other states" endorsement. The liability limits shall be not less than:

Workers' Compensation: Statutory

Employers' liability: \$1,000,000 each occurrence

2. Commercial Automobile Liability Insurance. This insurance shall be occurrence type written in comprehensive form and shall protect CONTRACTOR, and CITY, DESIGN PROFESSIONAL and Consultants against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the Project Site, whether they are owned, non-owned, or hired.

The liability limits shall be not less than: \$2,000,000

3. Commercial General Liability Insurance. This insurance shall be occurrence type written in comprehensive form acceptable to CITY. This insurance shall protect CONTRACTOR, and CITY, DESIGN PROFESSIONAL and Consultants as additional insureds, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The policy shall also include coverage for personal injury liability; contractual liability; completed operations and products liability; and for blasting, explosion, and collapse of buildings; and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

\$2,000,000 combined single limit for each occurrence

\$2,000,000 general aggregate.

4. The insurer's costs of providing the insureds a defense and appeal as additional insureds, including attorney's fees, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's separate responsibility.

## **5.05 CITY's Liability Insurance**

**A.** In addition to the insurance required to be provided by CONTRACTOR under Paragraph 5.04, CITY, at CITY's option, may purchase and maintain at CITY's expense liability insurance

that will protect CITY against claims which may arise from operations under the Contract Documents.

## **5.06 Property Insurance**

**A.** Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain property insurance on the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws or Regulations). This insurance shall:

1. include the interests of CITY, CONTRACTOR, Subcontractors, and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;
2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, tornado, collapse, debris removal, demolition occasioned by enforcement of Laws or Regulations, water damage, damage caused by frost and freezing, and acts of God;
3. be maintained in effect until final payment is made unless otherwise agreed to in writing by CITY with thirty (30) days written notice to each other additional insured to whom a certificate of insurance has been issued.

**B.** CITY shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others involved in the Work to the extent of any deductible amounts. The risk of loss within the deductible amounts will be borne by CONTRACTOR, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

## **5.07 Waiver of Rights**

**A.** CITY and CONTRACTOR intend that all policies purchased in accordance with Paragraphs 5.04 and 5.06 will protect CITY, CONTRACTOR, DESIGN PROFESSIONAL Consultants, Subcontractors, and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds in such policies and will provide primary coverage for all losses and damages caused by the perils covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. CITY and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees and agents for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work, but only to the extent of insurance coverage; and, in addition, waive all such rights against DESIGN PROFESSIONAL, Consultants, Subcontractors, and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of any and each of them) under such policies for losses and damages so caused and covered by insurance. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by CITY as trustee or otherwise payable under any policy so issued. None of the above waivers shall apply if specifically in conflict with Laws and Regulations.

## **5.08 Receipt and Application of Insurance Proceeds**

**A.** Any insured loss under the property insurance will be adjusted with CITY and made payable to CITY as fiduciary for the insureds, as their interests may appear, subject to the requirements of any indentures of indebtedness entered into by CITY.

**B.** CITY as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object to CITY's exercise of this power in writing within fifteen (15) days after the occurrence of loss. If such objection is made, CITY as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, CITY as fiduciary shall adjust and settle the loss with the insurers.

## **5.09 Partial Utilization – Property Insurance**

**A.** If CITY finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with Paragraph 14.05; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

# **ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES**

## **6.01 Indemnification**

**A.** For purposes of this Paragraph 6.01 only, the following terms shall have the meanings listed:

1. Claims means all claims, damages, liability, losses, costs and expenses, including court costs and reasonable attorneys' fees, including attorney's fees incurred by the City in the enforcement of this indemnity obligation.

2. CONTRACTOR'S Agents means CONTRACTOR's officers, employees, sub-consultants, subcontractors, successors, assigns, invitees, and other agents.

3. CITY means CITY, its Program Manager/Construction Advisor and any of their agents, officials, officers, employees and program managers or construction advisors.

**B.** CONTRACTOR's obligations under this Paragraph with respect to indemnification for acts or omissions, including negligence, of CITY, shall be limited to the coverage and limits of insurance that CONTRACTOR is required to procure and maintain under this Contract. CONTRACTOR affirms that it has had the opportunity to recover the costs of the liability insurance required in this Contract in its contract price.

**C.** CONTRACTOR shall defend, indemnify and hold harmless CITY from and against all Claims arising out of or resulting from all acts or omissions in connection with this Contract caused in whole or in part by CONTRACTOR or CONTRACTOR's Agents, regardless of whether or not caused in part by any act or omission, including negligence, of OWNER.

**D.** In any and all Claims against CITY, DESIGN PROFESSIONAL, CONSULTANT, or any of their respective agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.01 C shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

E. The indemnification obligations of CONTRACTOR under Paragraph 6.01 C shall not extend to liability arising out of, resulting from, or caused by the professional negligence, errors or omissions of DESIGN PROFESSIONAL, CONSULTANT, or any of their respective agents, officers, directors or employees.

## **6.02 Supervision and Superintendence**

A. CONTRACTOR shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or specification of a specific means, method, technique, sequence or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent of the Work, who shall not be replaced without written request to and approval by CITY except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

C. If it is determined to be in the best interest of the Work, CONTRACTOR shall replace the project manager, resident superintendent or any other employee of the CONTRACTOR, Subcontractors, Suppliers or other persons or organizations performing or furnishing any of the Work on the project upon written request by the CITY.

## **6.03 Services, Working Hours, Labor, Materials and Equipment**

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out and construct or perform the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the Site shall be performed during regular working hours. CONTRACTOR shall not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without CITY's written consent given after prior written notice to DESIGN PROFESSIONAL.

B. Unless otherwise specified in Division 1, General Requirements, CONTRACTOR shall furnish and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

C. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of CITY. If required by DESIGN PROFESSIONAL, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

D. It is the policy of the CITY that any manufactured goods or commodities used or supplied in the performance of this Contract and any subcontract hereto shall be manufactured or produced in the United States whenever possible.

## **6.04 Progress Schedule**

**A.** CONTRACTOR shall adhere to the progress schedule established in accordance with Article 2 as it may be adjusted from time to time as provided below:

1. CONTRACTOR shall provide, at least once every thirty (30) calendar days, updated information on the project schedule, including thirty (30) day look ahead schedules, projected variances per event category and per Subcontractor, identification of all variances and calculation of the number of Days difference between the as-built critical path and the project schedule critical path

2. CONTRACTOR shall, with each application for payment, provide completed monthly updated status report for the previous month on the project schedule and updated information indicating as-built and as-planned conditions. The updated information on the project schedule shall not modify any Milestone dates in the project schedule that CITY has previously approved. The updated information required is a condition precedent to payment pursuant to paragraph 14.02 and shall include at a minimum:

- a. a concise statement of the outlook for meeting project schedule dates and the reasons for any change in outlook from the previous report;
- b. a review of any significant technical problems encountered during the month;
- c. an explanation of any corrective action taken or proposed; and
- d. a summary of any Claims anticipated by CONTRACTOR with respect to the Work, including the anticipated costs and schedule impacts of any such Claims.

## **6.05 Recovery Schedules**

**A.** If the CONTRACTOR should:

1. fail, refuse or neglect to supply a sufficient number of workers or to deliver the materials or equipment with such promptness as to prevent the delay in the progress of the Work;
2. fail in any respect to commence and diligently prosecute the Work in accordance with the approved baseline project schedule in order to achieve substantial completion;
3. fail to commence, prosecute, finish, deliver or install the different portions of the Work on time as specified in the approved baseline project schedule; or
4. fail in the performance of any of the material covenants of the Contract Documents;

CITY shall have the right to direct the CONTRACTOR, upon seven (7) calendar days notice, to prepare a written recovery plan, for CITY's approval, to accelerate the Work in order to conform to the approved baseline project schedule, including, without limitation, providing additional labor or expediting delivery of materials, performing overtime or re-sequencing the Work without adjustments to the Contract value. Upon CITY's approval of the recovery plan, CONTRACTOR shall accelerate the Work in accordance with the plan.

**B.** Proposed recovery schedules shall be submitted to the CITY as a separate project plan for review and approval by CITY prior to incorporation into the approved baseline schedule. The recovery schedule shall be submitted in a format compatible with the baseline schedule format. Each proposed revision shall be submitted as a separate schedule, with the following minimum requirements:

1. A critical path method diagram showing revised and affected activities or Milestones.
2. An activity report for all revised and affected activities or Milestones.

**C.** Upon acceptance of the recovery schedule by CITY, data shall be added or revised for all new or revised activities and incorporated into the approved baseline project schedule.

## 6.06 Substitutes and “Or-Equal” Items

**A. Materials or equipment:** Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance and quality required. Unless the specification or description contains, or is followed by, words reading that no like, equivalent or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to CITY for review by CITY’s Representative under the following circumstances:

1. “Or-Equal”: If, prior to receipt of Bids, Bidder proposes an item of material or equipment as functionally equal to that named and sufficiently similar so that no change in related Work will be required, CITY’s Representative may request DESIGN PROFESSIONAL to consider it as an “or-equal” item. DESIGN PROFESSIONAL will review and recommend the acceptance, or rejection, of the proposed item to the CITY’s Representative. For the purposes of this Paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment DESIGN PROFESSIONAL determines that:

(1) it is at least equal in quality, durability, appearance, strength, and design characteristics; and

(2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; and

b. Bidder certifies that:

(1) there is no increase in cost to the CITY; and

(2) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

If the CITY’s Representative approves the proposed item, it may be accepted by CITY.

2. Substitute Items: If CONTRACTOR proposes an item of material or equipment as a substitute item, then CONTRACTOR shall submit sufficient information as provided below to allow CITY’s Representative to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. The procedure for review by the CITY’s Representative will include the following as supplemented in the General Requirements and as CITY’s Representative may determine is appropriate under the circumstances:

a. Requests for review of proposed substitute items of material or equipment will not be accepted by CITY’s Representative from anyone other than CONTRACTOR.

b. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall first make written application to CITY’s Representative for acceptance thereof.

c. In the application, CONTRACTOR shall certify that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will impact CONTRACTOR’s achievement of Substantial Completion, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with CITY for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.

d. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by CITY's Representative in evaluating the proposed substitute. CITY's Representative may require CONTRACTOR to furnish additional data about the proposed substitute.

If the CITY's Representative approves the proposed item, CITY may accept it.

**B. Substitute Construction Methods or Procedures:** If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to DESIGN PROFESSIONAL. CONTRACTOR shall notify CITY and submit sufficient information to allow DESIGN PROFESSIONAL, in DESIGN PROFESSIONAL's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents.

**C. Expenses:** Bidder shall provide all data in support of any "or equal" at Bidder's expense, and CONTRACTOR shall provide all data in support of any proposed substitute at CONTRACTOR's expense.

**D. Evaluation:** DESIGN PROFESSIONAL and CITY's Representative will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.06 A, and 6.06 B. CITY will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized without CITY's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. CITY may require CONTRACTOR to furnish at CONTRACTOR's expense, a special performance guarantee or other surety with respect to any "or-equal" substitute. DESIGN PROFESSIONAL will record time required by DESIGN PROFESSIONAL and Consultants in evaluating substitutes proposed or submitted by CONTRACTOR pursuant to Paragraphs 6.06 A and 6.06 B and in making changes in the Contract Documents (or in the provisions of any other direct contract with CITY for work on the Project) occasioned thereby. Whether or not CITY accepts a substitute so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse CITY for the reasonable charges of DESIGN PROFESSIONAL and Consultants for evaluating each such proposed substitute.

## **6.07 Concerning Subcontractors, Suppliers and Others**

**A.** CONTRACTOR shall not employ or retain any Subcontractor, Supplier or other person or organization (including those acceptable to CITY as indicated in Paragraph 6.07 B), whether initially or as a substitute, against whom CITY has a reasonable objection, including but not limited to debarment by City or another governmental entity or decertification of the Subcontractor from the City's Minority and Women's Business Enterprise Program as a result of the Subcontractor's failure to comply with any of the requirements of the provisions of Chapter 3 of the City's Code as determined by the Director of the Civil Rights and Equal Opportunity Department. Contractor shall insert this provision in any subcontractor agreement associated with this Contract. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection. CONTRACTOR shall submit required information for all Subcontractors on Form 01290.09 - Subcontractor and Major Material Suppliers List, provided in these Contract Documents, prior to Subcontractor beginning Work at the Site.

**B.** The Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to CITY on or before the date specified in the Supplementary Conditions, for acceptance by CITY. If CONTRACTOR has submitted a list

thereof in accordance with the Supplementary Conditions, CITY may accept (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Contract Documents) any such Subcontractor, Supplier or other person or organization so identified, or may reject same on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier or other person or organization. The Contract Price will be adjusted by the difference in the cost occasioned by such substitution, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by CITY of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of CITY or DESIGN PROFESSIONAL to reject defective Work.

**C.** CONTRACTOR shall be fully responsible to CITY for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier or other person or organization any contractual relationship between CITY or DESIGN PROFESSIONAL and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of CITY or DESIGN PROFESSIONAL to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws or Regulations.

**D.** CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

**E.** CONTRACTOR shall contractually require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with CITY and DESIGN PROFESSIONAL through CONTRACTOR.

**F.** The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

**G.** All Work performed for CONTRACTOR by a Subcontractor or Supplier shall be pursuant to an appropriate written agreement between CONTRACTOR and the Subcontractor or Supplier that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of CITY. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against CITY, CONTRACTOR, DESIGN PROFESSIONAL, Consultants and all other additional insureds for all losses and damages caused by, arising out of or resulting from any perils, to the extent covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

**H.** Except as otherwise provided in this subsection H and in accordance with the provisions of subsection C hereof, the agreement between CONTRACTOR and the Subcontractor or Supplier referred to in subsection G, shall provide that the CONTRACTOR and the Subcontractor or Supplier agree not to request CITY or CITY's Representative to intervene in or facilitate the resolution of claims or contract disputes arising out of or related to the agreement between CONTRACTOR and the Subcontractor or Supplier. Furthermore, the Contracts between CONTRACTOR and Subcontractors or Suppliers shall provide that all unresolved claims and disputes between CONTRACTOR and the Subcontractor or Supplier that remain unresolved after thirty (30) calendar days from the notice of claim, shall be subject to mediation as a condition precedent to the institution of legal proceedings by either party. Any such mediation shall be conducted in accordance with the CITY's Code Section 3-467.

I. CONTRACTOR shall not insert any provision in any subcontractor agreement associated with this Contract that explicitly states or implies that the subcontractor shall only be paid for work performed if or when the general CONTRACTOR is paid by the CITY . Contractor's compliance with this provision is a material term of this Contract.

J. CONTRACTORS shall not deny any Subcontractor subcontracting opportunities solely because the Subcontractor is not a signatory to collective bargaining agreements with organized labor.

#### **6.08 Patent Fees and Royalties**

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation into the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work, and if to the actual knowledge of CITY or DESIGN PROFESSIONAL its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by CITY in the Contract Documents. To the fullest extent permitted by Laws or Regulations, CONTRACTOR shall defend, indemnify and hold harmless CITY, DESIGN PROFESSIONAL, Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation into the Work of any invention, design, process, product or device not specified in the Contract Documents.

#### **6.09 Permits**

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. CITY shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Contract. CONTRACTOR shall pay all charges of utility owners for connections to the Work.

B. CONTRACTOR, at its own expense, shall comply with all Federal, State and local laws and regulations, including, but not limited to the Missouri Clean Water Law (Chapter 644 RSMo) together with any accompanying regulation(s) contained in the Missouri Code of State Regulations (CSR Title 10), as well as any implementing permits, together with any CITY Provisions during the life of this Contract including but not limited to:

1. Approvals and permits as required for construction or land disturbance activities.
2. Compliance with the State of Missouri – Department of Natural Resources (“MDNR”) Missouri State Operating Permit (“Land Disturbance Permit”), MO-R100006 for all construction or land disturbance activity.
3. Development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).
  - (a) Contractor shall not commence land disturbance activity until the initial SWPPP has been finalized.
  - (b) Preparation and submittal of all applications, documentation and exhibits required to obtain MDNR approvals for uninterrupted Work at the Site.
  - (c) Amending/Updating SWPPP.
  - (d) Site Inspections and submittal of Inspection Reports

(e) Proper Operation and Maintenance to achieve compliance with the terms of the Permit.

(f) Maintenance of required records in accordance with MDNR requirements and requirements included in Article 6 of these Contract Documents.

4. In addition to requirements of Article 6, Contractor shall also provide record access to Missouri Department of Natural Resources (MDNR).

5. Failure to control erosion and water pollution is a permit violation. CONTRACTOR shall have 24 hours after receiving notice of the violation to correct the problem. If the CONTRACTOR fails to correct the problem after the time prescribed, the City will hire a remediation expert to fix the problem. In such an event, the CONTRACTOR shall be liable to the City for the remediation costs plus a 10% mark-up of the total contract price. If the CONTRACTOR receives three (3) notices of violation of the erosion control plan and the City's MS4 permit, the Director may issue a stop work order and delay any payment until control measures are properly functioning and stream damage has been mitigated. In such an event, any delay to the project schedule will result in liquidated damages assessed against the CONTRACTOR.

## **6.10 Compliance with Laws and Regulations**

**A.** CONTRACTOR shall comply with all federal, state and local laws, ordinances and regulations applicable to the work and this Contract. CONTRACTOR shall give all notices and comply with all Laws or Regulations applicable to furnishing and performing the Work. Except where otherwise expressly required by applicable Laws or Regulations, neither CITY nor DESIGN PROFESSIONAL shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations. The Laws or Regulations included in this Paragraph shall include, but not be limited to, those set forth in the Supplementary Conditions.

**B. Failure to Comply.** If CONTRACTOR performs any Work in violation of applicable Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws or Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under Paragraph 3.03.

**C. Conflicts of Interest.** The provisions of City's Code Sections 2-2001 and 3-301, prohibiting City officers and employees from having a financial or personal interest in any contract with City, and Code Sections 3-307, and 3-309, imposing sanctions for violations, shall apply to this Contract. CONTRACTOR certifies that no officer or employee of City has, or will have, a direct or indirect financial or personal interest in this Contract, and that no officer or employee of City, or member of such officer's or employee's immediate family, either has negotiated, or has or will have an arrangement concerning employment to perform services on behalf of CONTRACTOR on this Contract.

**D. Licenses and Permits.** CONTRACTOR, at its own expense, shall secure or cause to be secured all licenses and permits from public or private sources necessary for the fulfillment of its obligations under this Contract. All references in this Contract to the "Code" shall mean City's Code of Ordinances, including any amendments thereto or re-codification thereof unless the context clearly indicates otherwise. CONTRACTOR shall obtain copies of all necessary licenses and permits from Subcontractors required for the Work before Subcontractors begin Work at the Site. CONTRACTOR shall retain such evidence in its files and make available to CITY within ten (10) days after CITY's written request.

**E. Americans with Disabilities Act.** CONTRACTOR agrees to comply, during the course of this Contract, with all provisions of Title II of the 2010 ADA Standards for Accessible Design as amended from time to time.

**F. Affirmative Action.** If the Contract Price exceeds \$300,000.00 and CONTRACTOR employs fifty (50) or more people, CONTRACTOR shall comply with City's Affirmative Action requirements in accordance with the provisions of Chapter 3 of City's Code, the rules and regulations relating to those sections, and any additions or amendments thereto. CONTRACTOR shall not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age in a manner prohibited by Chapter 3 of City's Code.

CONTRACTOR shall:

1. Submit, in print or electronic format, a copy of CONTRACTOR'S current certificate of compliance to the City's Civil Rights and Equal Opportunity Department (CREO) prior to receiving the first payment under the contract, unless a copy has already been submitted to CREO at any point within the previous two calendar years. If, and only if, CONTRACTOR does not possess a current certification of compliance, CONTRACTOR shall submit, in print or electronic format, a copy of its affirmative action program to CREO prior to receiving the first payment under the contract, unless a copy has already been submitted to CREO at any point within the previous two calendar years.

2. Require any Subcontractor awarded a subcontract exceeding \$300,000.00 to affirm that Subcontractor has an affirmative action program in place and will maintain the affirmative action program in place for the duration of the subcontract.

3. Obtain from any Subcontractor awarded a subcontract exceeding \$300,000.00 a copy of the Subcontractor's current certificate of compliance and tender a copy of the same, in print or electronic format, to CREO within thirty (30) days from the date the subcontract is executed. If, and only if, Subcontractor does not possess a current certificate of compliance, CONTRACTOR shall obtain a copy of the Subcontractor's affirmative action program and tender a copy of the same, in print or electronic format, to CREO within thirty (30) days from the date the subcontract is executed.

City has the right to take action as directed by City's Civil Rights and Equal Opportunity Department to enforce this provision. If CONTRACTOR fails, refuses or neglects to comply with the provisions of Chapter 3 of City's Code, then such failure shall be deemed a total breach of this Contract and this Contract may be terminated, canceled or suspended, in whole or in part, and CONTRACTOR may be declared ineligible for any further contracts funded by City for a period of one (1) year. This is a material term of this Contract.

**G. Minority and Women Business Enterprises and Workforce.** City is committed to ensuring that minorities and women participate to the maximum extent possible in the performance of City's construction contracts. If minority and women business enterprise (M/WBE) goals have been set for this Contract, CONTRACTOR agrees to comply with all requirements of City's Minority and Women's Business Enterprise Program as enacted in City's Code, Sections 3-421 through 3-469 and as hereinafter amended. CONTRACTOR shall meet or exceed both the MBE and WBE goals set forth in its Contractor Utilization Plan/Request for Waiver. If workforce utilization goals are applicable to this Contract, CONTRACTOR agrees to comply with all requirements of City's Construction Employment Program as enacted in City's Code, Sections 3-501 through 3-527 and as hereinafter amended. CONTRACTOR shall meet or exceed the construction employment goals unless the same shall have been waived in the manner provided by law. CONTRACTOR's compliance with this provision is a material part of this Contract.

**H. Records.**

1. For purposes of this section:

(a) "City" shall mean the City Auditor, the City's Internal Auditor, the City's Director of Civil Rights and Equal Opportunity, the City Manager, the City department administering this Contract and their delegates and agents.

(b) "Record" shall mean any document, book, paper, photograph, map, sound recordings or other material, regardless of physical form or characteristics, made or received in connection with this Contract and all Contract amendments and renewals.

2. CONTRACTOR shall maintain and retain all Records for a term of five (5) years that shall begin after the expiration or termination of this Contract and all Contract amendments. City shall have a right to examine or audit all Records and CONTRACTOR shall provide access to City of all records upon ten (10) days written notice from the City.

#### **I. Prevailing Wage.**

1. CONTRACTOR shall comply and require its Subcontractors to comply with;

a. sections 290.210 to 290.340, RSMO the State of Missouri Prevailing Wage Law (the "Law"); and

b. 8 CSR 30-3.010 to 8 CSR 30-3.060, the Prevailing Wage Law Rules (the "Rules"); and

c. the Annual Wage Order (Wage Order) issued by the State of Missouri's Department of Labor and Industrial Relations; and

d. any applicable Annual Incremental Wage Increase (Wage Increase) to the Annual Wage Order.

2. The Law, Rules, Annual Wage Order and any Wage Increase are incorporated into and made part hereof this Contract and shall be collectively referred to in this Section as the "Prevailing Wage Requirements."

3. CONTRACTOR shall pay and require its Subcontractors to pay to all workers performing work under this Contract not less than the prevailing hourly rate of wages for the class or type of work performed by the worker in accordance with the Law, Rules, Wage Order and any applicable Wage Increase. CONTRACTOR shall take whatever steps are necessary to insure that the prevailing hourly wage rates are paid and that all workers for CONTRACTOR and each of its Subcontractors are paid for the class or type of work performed by the worker in accordance with the Prevailing Wage Requirements. If CONTRACTOR shall fail to start to perform CONTRACTOR's obligations under the Contract Documents within sixty (60) days from the Effective Date of the Contract, CONTRACTOR and each of its subcontractors shall be obligated to pay all workers in accordance with any new Wage Order, as subsequently amended by any applicable Wage Increase, issued by the Department of Labor and Industrial Relations within the aforementioned sixty (60) day period. The new Wage Order and any applicable Wage Increase shall govern notwithstanding the fact that the Wage Order being replaced might be physically attached or incorporated in the Contract Documents.

4. Prior to each of its Subcontractors beginning Work on the Site, CONTRACTOR shall require each Subcontractor to complete CITY's Form 00490 entitled "Pre-contract Certification" that sets forth the Subcontractor's prevailing wage and tax compliance history for the two (2) years prior to the bid. CONTRACTOR shall retain one (1) year and make the Pre-contract Certifications available to CITY within five (5) days after written request.

5. CONTRACTOR shall:

a. Keep and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to keep full and accurate records on City's "Daily Labor Force Report" Form indicating the worker's name, occupational title or classification group & skill and the workers' hours. City shall furnish blank copies of the Daily Labor Force Report Form to Contractor for its use and for distribution to Subcontractors. Contractor shall submit its and its Subcontractors Daily Labor Force Reports to City each day; and

b. Submit, and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to submit electronically, in a format prescribed by the City, Certified Payroll Report Information indicating the worker's name, address, social security number, occupation(s), craft(s) of every worker employed in connection with the public work together with the number of hours worked by each worker and the actual wages paid in connection with the Project and other pertinent information as requested by the City; and

c. Submit, and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to submit, electronically, in format prescribed by the City, a Payroll Certification. The Payroll Certification must be signed by the employee or agent who pays or supervises the payment of the workers employed under the Contract for the Contractor and each Subcontractor; and

d. The Daily Labor Force Report, documents used to compile information for the Certified Payroll Report, and Payroll Certification are collectively referred to in this Section as the "Records."

6. CONTRACTOR shall submit its and its Subcontractors Daily Labor Force Reports to CITY each day. CONTRACTOR shall make all of CONTRACTOR's and Subcontractors' Records open to inspection by any authorized representatives of OWNER and the Missouri Department of Labor and Industrial Relations at any reasonable time and as often as they may be necessary and such Records shall not be destroyed or removed from the State of Missouri for a period of one (1) year following the completion of the public work in connection with which the Records are made. CONTRACTOR shall have its and its Subcontractors Certified Payroll Reports and Payroll Certifications available at the CONTRACTOR's office and shall provide the Records to the City electronically at City's sole discretion. In addition, all Records shall be considered a public record and CONTRACTOR shall provide the Records to the CITY in the format required by the CITY within three (3) working days of any request by CITY at the CONTRACTOR's cost. CITY, in its sole discretion, may require CONTRACTOR to send any of the Records directly to the person who requested the Record at CONTRACTOR's expense.

7. CONTRACTOR shall post and keep posted a clearly legible statement of all prevailing hourly wage rates to be paid to all workers employed by CONTRACTOR and each of its Subcontractors in the performance of this Contract in a prominent and easily accessible place at the Site of the Work by all workers.

8. If the Contract Price exceeds \$250,000.00, CONTRACTOR shall and shall require each Subcontractor engaged in any construction of public works to have its name, acceptable abbreviation or recognizable logo and the name of the city and state of the mailing address of the principal office of the company, on each motor vehicle and motorized self-propelled piece of equipment which is used in connection with the Project during the time the CONTRACTOR or Subcontractor is engaged on the project. The sign shall be legible from a distance of twenty (20') feet, but the size of the lettering need not be larger than two (2") inches. In cases where equipment is leased or where affixing a legible sign to the equipment is impractical, the CONTRACTOR may place a temporary stationary sign, with the information required pursuant to this section, at the main entrance of the Project in place of affixing the required information on the equipment so long as such sign is not in violation of any state or federal statute, rule or regulation. Motor vehicles which are required to have similar information affixed thereto pursuant to requirements of a regulatory agency of the state or federal government are exempt from the provisions of this subsection.

9. CONTRACTOR must correct any errors in CONTRACTOR's or any Subcontractors' Records, or CONTRACTOR's or any Subcontractors' violations of the Law, Rules, Annual Wage Order and any Wage Increase within fourteen (14) calendar days after notice from CITY.

10. CONTRACTOR shall and shall require its Subcontractors to cooperate with the CITY and the Department of Labor and Industrial Relations in the enforcement of this Section, the Law, Rules, Annual Wage Order and any Wage Increase. Contractor shall and shall require its Subcontractors to permit CITY and the Department of Labor and Industrial Relations to interview any and all workers during working hours on the Project at CONTRACTOR's sole cost and expense.

11. CONTRACTOR shall file with CITY, upon completion of the Project and prior to final payment therefore, affidavits from CONTRACTOR and each of its Subcontractors, stating that each has fully complied with the provisions and requirements of the Missouri Prevailing Wage Law. CITY shall not make final payment until the affidavits, in proper form and order, from CONTRACTOR and each of its Subcontractors, are filed by CONTRACTOR.

12. CONTRACTOR shall forfeit as a statutory penalty to the CITY one hundred dollars (\$100.00) for each worker employed, for each calendar day, or portion thereof, such worker is paid less than the prevailing hourly rates for any work done under this Contract, by CONTRACTOR or by any of CONTRACTOR's Subcontractors. If CONTRACTOR or any of its Subcontractors have violated any section(s) of 290.210 to 290.340, RSMo, in the course of the execution of the Contract, CITY shall when making payments to the CONTRACTOR becoming due under this Contract, withhold and retain therefrom all sums and amounts due and owing as a result of any violation of sections 290.210 to 290.340, RSMo.

**J. Prevailing Wage Damages.** CONTRACTOR acknowledges and agrees that, based on the experience of CITY, violations of the Missouri Prevailing Wage Act, whether by CONTRACTOR or its Subcontractors, commonly result in additional costs to CITY. CONTRACTOR agrees that additional costs to CITY for any particular violation are difficult to establish and include but are not limited to: costs of construction delays, additional work for CITY, additional interest expenses, investigations, and the cost of establishing and maintaining a special division working under the City Manager to monitor prevailing wage compliance.

1. In the event of the failure by CONTRACTOR or any of its Subcontractors to pay wages as provided in the Missouri Prevailing Wage Act, CITY shall be entitled to deduct from the Contract Price, and shall retain as liquidated damages, one hundred dollars (\$100.00) per day, per worker who is paid less than the prevailing hourly rate of wages, to approximate the additional costs. The sum shall be deducted, paid or owed whether or not the Contract Times have expired.

2. CITY shall give written notice to CONTRACTOR setting forth the workers, who have been underpaid, the amount of the statutory penalty and the amount of the liquidated damages as provided for in this Subparagraph J. CONTRACTOR shall have fourteen (14) calendar days to respond, which time may be extended by CITY upon written request. If CONTRACTOR fails to respond within the specified time, the CITY's original notice shall be deemed final. If CONTRACTOR responds to CITY's notice, CITY will furnish CONTRACTOR a final decision in writing within five (5) days of completing any investigation.

**K. Missouri Secretary of State Business Entity Registration.** CONTRACTOR shall obtain from all Subcontractors for the Project, a copy of their current certificate of good standing or fictitious name registration from the Missouri Secretary of State before they begin work on the Site. CONTRACTOR shall retain such documents in its files and make available to CITY within ten (10) days after written request.

**L. Tropical Hardwoods.** The provisions of Code Section 2-1872, restricting the use of tropical hardwoods, shall apply to this Contract.

**M. Preference for Missouri Products.** Pursuant to Section 71.140 RSMo., preference shall be given to materials, products, supplies and all other articles produced, manufactured, made or grown within the State of Missouri.

**N. Guidelines for Open Excavations.**

1. CONTRACTOR shall restore required excavations to the level of the adjacent surfaces as soon as practicable. Unsupervised open excavations on public properties are discouraged at all times. If CONTRACTOR, in performance of the Work, makes or causes to be made any excavation in, upon, under, through or adjoining any street, sidewalk, alley, park, boulevard, parkway or any other public properties, and shall leave any part or portion thereof open, CONTRACTOR shall provide effective protection to the public.

2. CONTRACTOR shall protect and secure all excavations in roadways in compliance with existing federal, state and local codes and standards, including, but not limited to the most current edition of the Manual of Uniform Traffic Control Devices. CONTRACTOR shall protect and secure all unsupervised excavations not within roadways, either by covering or fencing.

a. Covering. A protective cover that can sustain the weight of persons or of objects that are placed upon it may be installed over an unsupervised excavation. The cover shall be secured to the ground to prevent movement. Protective covers shall have no opening(s) or protuberance(s) of sufficient size to cause a fall and/or injury. Advance warning devices shall be installed as necessary.

b. Fencing. Fencing to prevent entry may be installed surrounding an unsupervised excavation not protectively covered in its entirety. The fencing shall be a minimum of 42" in height. The fencing shall be constructed in such a manner that it is adequately secured and will remain upright at all times under normal Site conditions. All protective coverings and fences over and around excavations shall be inspected at least daily to assure integrity. Protective coverings and/or fences in heavily trafficked areas shall be inspected more often as necessary.

**O. Notification of Utilities.** CONTRACTOR shall adhere to the provisions of Sections 319.010 et seq., RSMo., which requires that a person or firm making an excavation in any public street, road or alley, right of way dedicated to public use, utility easement of record, or within any private street or private property do so only after giving notice to, and obtaining information from, owners of Underground Facilities. The 24-hour, toll-free accident prevention hotline number in Missouri is 1-800-344-7483 (1-800-Digrite).

**P. Employee Eligibility Verification.** CONTRACTOR shall adhere to the provisions of Sections 285.525 et seq., RSMo., which requires that for any contract exceeding five thousand dollars (\$5,000.00), CONTRACTOR shall execute and submit an affidavit, in a form prescribed by CITY, affirming that CONTRACTOR does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U.S.C. § 1324a(h)(3). CONTRACTOR shall attach to the affidavit documentation sufficient to establish CONTRACTOR'S enrollment and participation in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986. CONTRACTOR may obtain additional information about E-Verify and enroll at <https://e-verify.uscis.gov/enroll/StartPage.aspx?JS=YES>. For those Contractors enrolled in E-Verify, the first and last pages of the E-Verify Memorandum of Understanding that CONTRACTOR will obtain upon successfully enrolling in the program shall constitute sufficient documentation for purposes of complying with this Section. CONTRACTOR shall submit the affidavit and attachments to CITY prior to execution of the Contract, or at any point during the term of the Contract if requested by City.

**Q. OSHA 10-Hour Training Requirement.** CONTRACTOR and any subcontractor working under this Contract shall require every employee on the Site to complete a ten-hour construction safety program which meets the requirements of Section 292.675, RSMo, except for those employees who shall have previously completed the required program and hold documentation to that effect. CONTRACTOR shall remove or require the removal of any

person from the Site who is subject to this requirement and who does not complete or is unable to produce documentation of their successful completion of the required program within the time limitations prescribed by Section 292.675, RSMo. CONTRACTOR shall forfeit the sum of two thousand five hundred dollars (\$2,500.00), in addition to one hundred dollars (\$100.00) per employee each calendar day, or portion thereof, the employee(s) shall continue to be employed without having completed the required program within the time limitations prescribed by Section 292.675, RSMo. CITY shall be entitled to withhold and retain any amounts due and owing hereunder when making payment to CONTRACTOR.

**R. Clean Air Act and Clean Water Act.** CONTRACTOR shall comply with requirements of the Clean Air Act (42 U.S.C. 7401 *et seq.*); Clean Water Act (33 U.S.C. 1251 *et seq.*), Missouri Clean Water Law (Chapter 644 RSMo), Code of Federal regulations (Title 40: Protection of Environment, Title 33: Navigation and Navigable Waters) and the rules of the Missouri Code of State Regulations (CSR Title 10).

**S. Contract information Management System.** If applicable, CONTRACTOR shall comply with CITY's Contract Information Management System requirements. CONTRACTOR shall use CITY's Internet web based Contract Information Management System/Project Management Communications Tool provided by CITY and protocols included in that software during the term of this Contract. CONTRACTOR shall maintain user applications to CITY's provided system for all personnel, subcontractors or suppliers as applicable and shall require subcontractors/subconsultants to maintain same.

**T. Anti-Discrimination Against Israel.** If this Contract exceeds \$100,000.00 and CONTRACTOR employs at least ten employees, pursuant to Section 34.600, RSMo., by executing this Contract, CONTRACTOR certifies it is not currently engaged in and shall not, for the duration of this contract, engage in a boycott of goods or services from the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel.

#### **U. Ban the Box in Hiring and Promotion**

- a. Pursuant to Section 38-104, City Code Ordinances, CONTRACTOR shall not base a hiring or promotional decision on an applicant's criminal history or sentence related thereto, unless the employer can demonstrate that the employment-related decision was based on all information available including consideration of the frequency, recency and severity of a criminal record and that the record was reasonably related to the duties and responsibilities of the position.
- b. Notwithstanding subsection (a), CONTRACTOR may inquire about an applicant's criminal history after it has been determined that the individual is otherwise qualified for the position, and only after the applicant has been interviewed for the position. Any such inquiry may be made of all applicants who are within the final selection pool of candidates from which a job will be filled.
- c. This provision shall not apply to positions where employers are required to exclude applicants with certain criminal convictions from employment due to local, state or federal law or regulation.

#### **V. Title VI of the Civil Rights Act of 1964**

- a. Title VI of the Civil Rights Act of 1964 requires that no person in the United States shall, on the grounds of race, color, or national or origin (including limited English proficient individuals), be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance. The City of Kansas City, Missouri requires compliance with the requirements of Title VI in all of its programs and activities regardless of the funding source.

- b. CONTRACTOR shall not discriminate on the grounds of race, color, or national or origin (including limited English proficient individuals).

#### **W. Non-discrimination in Employment**

CONTRACTOR shall not discriminate against any employee or candidate for employment on the basis of an individual's race, hair texture or hair style associated with an individual's race, color, sex, religion, national origin, or ancestry, disability, sexual orientation, gender identity or age in a manner prohibited by Chapter 38 of the City Code. CONTRACTOR shall not engage in any discrimination as prohibited by Chapter 3 of the City Code.

#### **X. Quality Services Assurance Act**

If this Contract exceeds \$160,000.00, CONTRACTOR certifies that CONTRACTOR will pay all employees who will work on this Contract in the city limits of Kansas City, Missouri at least \$15.00 per hour in compliance with the City's Quality Services Assurance Act, Section 3-66, Code of Ordinances unless City has granted CONTRACTOR an exemption pursuant to the Quality Services Assurance Act.

### **6.11 Taxes**

**A.** CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws or Regulations of the place of the Project which are applicable during the performance of the Work.

#### **B. Tax Compliance.**

1. As a condition precedent to CITY making its first payment to CONTRACTOR under this Contract, CONTRACTOR shall furnish to CITY sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year prior to the date provided to CITY, verifying that CONTRACTOR is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department.

2. As a condition precedent to Subcontractors performing any Work under this Contract, CONTRACTOR shall obtain from Subcontractor sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year before the date Subcontractor begins Work, verifying that the Subcontractor is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department. CONTRACTOR shall retain such documentation in its files and make available to CITY within ten (10) days after a written request.

3. As a condition precedent to CITY making final payment under this Contract, if this Contract is longer than one (1) year and exceeds the dollar threshold established by ordinance and included in the Supplementary Conditions, CONTRACTOR shall furnish to CITY sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year before the filing of a final Application for Payment, verifying that CONTRACTOR is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department.

4. If this Contract is longer than one (1) year and exceeds the dollar threshold established by ordinance and included in the Supplementary Conditions, CONTRACTOR shall obtain from Subcontractors sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year before the date of CONTRACTOR's final payment to the Subcontractor, that the Subcontractor was or is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department. CONTRACTOR shall retain such documentation in its files and make available to CITY within ten (10) days after written request.

5. If, at the time of final payment to CONTRACTOR, CONTRACTOR is unable to obtain from all its Subcontractors, if any, and furnish to CITY sufficient proof from City's Commissioner of Revenue that all its Subcontractors are in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department, CITY may approve final payment to CONTRACTOR if CITY determines that CONTRACTOR has made a good faith effort to furnish evidence or that there are other extenuating circumstances which make it impossible for CONTRACTOR to furnish sufficient proof.

**C. Missouri Sales Tax Exemption.** Pursuant to Section 144.062, RSMo, CITY is a Missouri exempt entity and tangible personal property to be incorporated or consumed in the construction of this Project may be purchased without sales tax. CITY shall furnish CONTRACTOR a Missouri Project Exemption Certificate for Sales Tax at the time of issuance of the Notice to Proceed.

## **6.12 Use of Site and Other Areas**

**A.** CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas identified in and permitted by the Contract Documents and other areas permitted by Laws or Regulations. CONTRACTOR shall not unreasonably encumber the Site and the other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to the Site or the other areas, or to the owner or occupant thereof, or of any adjacent land or areas, resulting from the performance of the Work.

**B.** Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. In case of a failure on the part of the CONTRACTOR to restore such property or to make good such damage or injuries, the CITY may, upon forty-eight (48) hours written notice to the CONTRACTOR, repair, rebuild or otherwise restore such property as the CITY may deem necessary, and the cost thereof will be deducted from any moneys due or which may become due the CONTRACTOR under this Contract.

**C.** CONTRACTOR shall, to the fullest extent permitted by Laws or Regulations, defend, indemnify and hold harmless CITY, DESIGN PROFESSIONAL, Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against CITY, DESIGN PROFESSIONAL or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

**D.** During the progress of the Work, CONTRACTOR shall keep the Site and the other areas free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from Site and other areas as well as all tools, appliances, construction equipment and machinery and surplus materials. CONTRACTOR shall leave the Site clean and ready for utilization or occupancy by CITY at Substantial Completion of the Work. CONTRACTOR shall restore to all property not designated for alteration by the Contract Documents to its pre-Work condition.

**E.** CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

## **6.13 Record Documents**

**A.** CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, the Contract, Written Amendments, Change Orders, Work

Change Directives, and written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents, together with all approved Samples and a counterpart of all approved Shop Drawings, will be available to CITY and DESIGN PROFESSIONAL for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered to DESIGN PROFESSIONAL for CITY.

#### **6.14 Safety and Protection**

**A.** CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall comply with all applicable Laws or Regulations relating to the safety of persons or property to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for safety and protection. CONTRACTOR shall deliver to CITY a copy of CONTRACTOR'S Health and Safety Plan as provided in the Notice of Intent to Contract.

**B.** CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in Paragraph 6.14 B.2 or 6.14 B.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of CITY, DESIGN PROFESSIONAL, Consultant, or anyone employed by any of them or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR, Subcontractor, Supplier or other person or organization directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and DESIGN PROFESSIONAL has issued a notice to CONTRACTOR in accordance with Paragraph 14.07 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion). CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of the Work.

#### **6.15 Safety Representative**

**A.** In accordance with OSHA standards, CONTRACTOR shall designate a qualified and experienced safety representative whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs. CONTRACTOR's safety representative shall remain at the Site whenever there is Work in progress and shall immediately notify CITY of any emergencies or accidents occurring at the Site

#### **6.16 Hazard Communication Programs**

**A.** CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

## **6.17 Emergencies**

**A.** In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR, without special instruction or authorization from CITY or DESIGN PROFESSIONAL, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give CITY and DESIGN PROFESSIONAL prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If CITY determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to an emergency, a Work Change Directive or Change Order will be issued.

**B.** A change in the Contract Documents pursuant to Paragraph 6.15 A will not be an automatic authorization of, nor a condition precedent to, entitlement to adjustment in the Contract Price or Contract Times. If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price or Contract Times, a Claim may be made therefore as provided in Article 16. However, OWNER, DESIGN PROFESSIONAL and Consultants shall not be liable to CONTRACTOR for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

## **6.18 Shop Drawings and Samples**

**A.** CONTRACTOR shall submit Shop Drawings to DESIGN PROFESSIONAL for review and approval in accordance with the accepted schedule of Shop Drawings and Sample submittals (see Paragraph 2.07). All submittals shall be identified as DESIGN PROFESSIONAL may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show DESIGN PROFESSIONAL the services, materials and equipment CONTRACTOR proposes to provide and to enable DESIGN PROFESSIONAL to review the information for the limited purposes required by Paragraph 6.18 D.

**B.** CONTRACTOR shall also submit Samples to DESIGN PROFESSIONAL for review and approval in accordance with said accepted schedule of Shop Drawings and Sample submittals. Each Sample shall be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as DESIGN PROFESSIONAL may require to enable DESIGN PROFESSIONAL to review the submittal for the limited purposes required by Paragraph 6.18 D. The numbers of each Sample to be submitted will be as specified in the Specifications.

### **C. Submittal Procedures:**

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;

b. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work;

c. all information relative to means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto; and

d. CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

3. At the time of each submission, CONTRACTOR shall give DESIGN PROFESSIONAL specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, the notice to be in a written communication separate from the submittal, and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to DESIGN PROFESSIONAL for review and approval of each such variation.

#### **D. DESIGN PROFESSIONAL's Review:**

1. DESIGN PROFESSIONAL will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by DESIGN PROFESSIONAL as required by Paragraph 2.06. DESIGN PROFESSIONAL's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation into the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. DESIGN PROFESSIONAL's review and approval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. DESIGN PROFESSIONAL's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called DESIGN PROFESSIONAL's attention to each such variation at the time of submission as required by Paragraph 6.18 C.3, and DESIGN PROFESSIONAL has given written approval of each such variation by specific written notation thereof incorporated into or accompanying the Shop Drawing or Sample approval; nor will any approval by DESIGN PROFESSIONAL relieve CONTRACTOR from responsibility for complying with the requirements of Paragraph 6.18 C.1.

**E.** Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by DESIGN PROFESSIONAL as required by Paragraph 2.06, any related Work performed prior to DESIGN PROFESSIONAL's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

**F.** CONTRACTOR shall make corrections required by DESIGN PROFESSIONAL and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by DESIGN PROFESSIONAL on previous submittals.

#### **6.19 Continuing the Work**

**A.** CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with CITY. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as CITY and CONTRACTOR may otherwise agree in writing.

#### **6.20 CONTRACTOR's General Warranty and Guarantee**

**A.** CONTRACTOR warrants and guarantees to CITY, DESIGN PROFESSIONAL and Consultants that all Work will be in accordance with the Contract Documents and will not be

defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers or any other individual or entity for whom CONTRACTOR is responsible; or
2. normal wear and tear under normal usage.

**B.** CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by DESIGN PROFESSIONAL;
2. recommendation of any progress or final payment by DESIGN PROFESSIONAL;
3. the issuance of a certificate of Substantial Completion or any payment related thereto by CITY to CONTRACTOR;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by DESIGN PROFESSIONAL;
6. any inspection, test or approval by others; or
7. any correction of defective Work by CITY.

**C.** Nonconforming Work is rejected unless expressly accepted in writing by the CITY's Representative.

## **ARTICLE 7 OTHER WORK**

### **7.01 Related Work at Site**

**A.** CITY may perform other work related to the Project at the Site by CITY's own forces, or let other direct contracts therefore, or have other work performed by utility owners. If such other work is to be performed and such fact was not noted in the Contract Documents, then:

1. Written notice thereof will be given to CONTRACTOR prior to starting any such other work, and
2. CONTRACTOR may make a Claim therefore as provided in Article 16 if CONTRACTOR believes that such performance involves additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the amount or extent thereof.

**B.** CONTRACTOR shall afford each other contractor who is a party to such a direct contract, and each utility owner (and CITY, if CITY is performing the additional work with CITY's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of CITY and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between CITY and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to CITY and DESIGN PROFESSIONAL in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution or results of CONTRACTOR's Work. CONTRACTOR's failure to report same will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work, except for latent or non-apparent defects and deficiencies in such other work.

## **7.02 Coordination**

A. If CITY contracts with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the person, firm or corporation who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified;
2. the specific matters to be covered by such authority and responsibility will be itemized; and
3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, CITY shall have sole authority and responsibility in respect of such coordination.

## **ARTICLE 8 CITY'S RESPONSIBILITIES**

### **8.01 Communications to CONTRACTOR**

A. Except as otherwise provided in these General Conditions, CITY shall issue all communications to CONTRACTOR.

### **8.02 Replacement of DESIGN PROFESSIONAL**

A. In case of termination of the employment of DESIGN PROFESSIONAL, CITY shall appoint a DESIGN PROFESSIONAL whose status under the Contract Documents shall be that of the former DESIGN PROFESSIONAL.

### **8.03 Furnish Data and Prompt Payment**

A. CITY shall promptly furnish the data required of OWNER under the Contract Documents and shall make payments to CONTRACTOR when they are due.

### **8.04 Lands and Easements; Reports and Tests**

A. CITY's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to CITY's duty to identify and make available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the Site and drawings of physical conditions in existing structures at or contiguous to the Site that have been utilized by DESIGN PROFESSIONAL in preparing the Contract Documents.

### **8.05 Insurance**

A. CITY's responsibilities, if any, for purchasing and maintaining liability and property insurance are set forth in Article 5 and the Supplementary Conditions.

### **8.06 Change Orders**

A. CITY is obligated to execute Change Orders as indicated in Paragraph 10.03.

### **8.07 Inspections, Tests and Approvals**

A. CITY's responsibility for certain inspections, tests and approvals is set forth in Paragraph 13.02 F.

## **8.08 Limitations on CITY's Responsibilities**

A. The CITY shall not supervise, direct or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws or Regulations applicable to the furnishing or performance of the Work. CITY will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

## **8.09 Undisclosed Hazardous Environmental Condition**

A. CITY's responsibility for an undisclosed Hazardous Environmental Condition uncovered or revealed at the Site is set forth in Paragraph 4.06.

## **8.10 Evidence of Financial Arrangements**

A. CITY will furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract.

## **8.11 CITY's Representative**

A. CITY will provide a representative during the construction period. The duties, responsibilities and the limitations of authority of the CITY "'s Representative during construction are set forth in the Contract Documents.

## **8.12 Visits to Site**

A. CITY's Representative will make visits to the Site at intervals appropriate to the various stages of construction as CITY's Representative deems necessary in order to observe the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, CITY's Representative will endeavor to determine, in general, if the Work is proceeding in accordance with the Contract Documents. CITY's Representative will not be required to make exhaustive or continuous on-Site inspections to check the quality or quantity of the Work.

# **ARTICLE 9 DESIGN PROFESSIONAL's STATUS DURING CONSTRUCTION**

## **9.01 General Scope of DESIGN PROFESSIONAL's Duties**

A. DESIGN PROFESSIONAL's efforts will be directed toward providing for CITY a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of visits to the Site and on-Site observations, DESIGN PROFESSIONAL will keep CITY informed of the progress of the Work and will endeavor to guard CITY against defective Work. DESIGN PROFESSIONAL's visits to the Site and on-Site observations are subject to all the limitations on DESIGN PROFESSIONAL's authority and responsibility set forth in Paragraph 9.08.

## **9.02 Resident Project Representative**

A. If CITY and DESIGN PROFESSIONAL agree, DESIGN PROFESSIONAL will furnish a resident Project representative to assist DESIGN PROFESSIONAL in providing more extensive observation of the Work. The responsibilities, authority and limitations thereon of any such resident Project representative and assistants will be as provided in Paragraph 9.08 and in the Supplementary Conditions.

## **9.03 Clarifications and Interpretations**

A. DESIGN PROFESSIONAL will issue with reasonable promptness written clarifications or interpretations (which may be in the form of Drawings) of the requirements of the Drawings and Specifications prepared by the DESIGN PROFESSIONAL as DESIGN PROFESSIONAL may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on CITY and CONTRACTOR. If CITY or CONTRACTOR believes that a written clarification or

interpretation justifies an adjustment in the Contract Price pursuant to Article 11 and/ or the Contract Times pursuant to Article 12 and the parties are unable to agree to the amount or extent thereof, if any, a Claim may be made therefore as provided in Article 16.

#### **9.04 Rejecting Defective Work**

A. DESIGN PROFESSIONAL will have authority to disapprove or reject Work which DESIGN PROFESSIONAL believes to be defective, that DESIGN PROFESSIONAL believes will not produce a completed Project that conforms to the Contract Documents, or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. DESIGN PROFESSIONAL will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04 B, whether or not the Work is fabricated, installed or completed.

#### **9.05 Shop Drawings, Change Orders and Payments**

A. In connection with DESIGN PROFESSIONAL's authority as to Shop Drawings and Samples, see Paragraph 6.18.

B. In connection with DESIGN PROFESSIONAL's authority as to Change Orders, see Article 10.

C. In connection with DESIGN PROFESSIONAL's authority as to Applications for Payment, see Article 14.

#### **9.06 Determinations for Unit Prices**

A. DESIGN PROFESSIONAL will initially determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. DESIGN PROFESSIONAL will review with CONTRACTOR the DESIGN PROFESSIONAL's preliminary determinations on such matters before rendering a written opinion thereon (by recommendation of an Application for Payment or otherwise to the CITY). CITY reserves the right to make a final determination of the actual quantities and classifications of Unit Price Work in reviewing an Application for Payment. Within ten (10) days after the date of receipt of any such decision, CONTRACTOR may deliver to CITY and to DESIGN PROFESSIONAL written notice of intention to appeal CITY's decision pursuant to Article 16.

#### **9.07 Decisions on Requirements of Contract Documents and Acceptability of Work**

A. DESIGN PROFESSIONAL will be the initial interpreter of the requirements of the Drawings and Specifications prepared by DESIGN PROFESSIONAL and judge of the acceptability of the Work thereunder.

B. When functioning as interpreter and judge under this Paragraph 9.07, DESIGN PROFESSIONAL will not show partiality to OWNER or CONTRACTOR.

C. Claims, disputes and other matters relating to the acceptability of the Work, quantities and classifications of Unit Price Work, or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work will be referred initially to CITY's Representative in writing with a request for a formal decision in accordance with Article 16.

#### **9.08 Limitations on DESIGN PROFESSIONAL's Authority and Responsibilities**

A. Neither DESIGN PROFESSIONAL's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by DESIGN PROFESSIONAL in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise or performance of any authority or responsibility by DESIGN PROFESSIONAL shall create, impose or give rise to any duty owed by DESIGN PROFESSIONAL to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them.

**B.** DESIGN PROFESSIONAL will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws or Regulations applicable to the furnishing or performance of the Work. DESIGN PROFESSIONAL will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

**C.** DESIGN PROFESSIONAL will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

**D.** DESIGN PROFESSIONAL's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, Bonds and certificates of inspection, tests and approvals and other documentation required to be delivered by Paragraph 14.07 will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests and approvals, that the results certified indicate compliance with, the Contract Documents.

**E.** The limitations upon authority and responsibility set forth in this Paragraph 9.08 shall also apply to DESIGN PROFESSIONAL's Consultants, resident Project representative and assistants as identified in the Supplementary Conditions.

## **ARTICLE 10 CHANGES IN THE WORK**

### **10.01 Authorized Changes in the Work**

**A.** Without invalidating the Contract and without notice to any surety, CITY may, at any time or from time to time, order additions, deletions or revisions in the Work. Such additions, deletions or revisions will be authorized by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved that will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

**B.** If CITY and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price pursuant to Article 11 or an adjustment of the Contract Times pursuant to Article 12 or both that should be allowed as a result of a Work Change Directive, a Claim may be made therefore as provided in Article 16.

### **10.02 Unauthorized Changes in the Work**

**A.** CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.17 or in the case of uncovering Work as provided in Paragraph 13.04.

### **10.03 Signing of Change Orders**

**A.** CITY and CONTRACTOR, and DESIGN PROFESSIONAL shall sign appropriate Change Orders covering:

1. changes in the Work which are:
  - a. ordered by CITY pursuant to Paragraph 10.01 A; or
  - b. required because of acceptance of defective Work under Paragraph 13.08 or correcting defective Work under Paragraph 13.09; or
  - c. agreed to by the parties;
2. changes in the Contract Price or Contract Times or both which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times or both which embody the substance of any written decision recommended by DESIGN PROFESSIONAL and approved by CITY pursuant to Paragraph 9.06, provided that, in lieu of signing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws or Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in Paragraph 6.19.

#### **10.04 Notification to Surety**

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times or both) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

### **ARTICLE 11 CHANGE OF CONTRACT PRICE**

#### **11.01 Change of Contract Price**

A. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at CONTRACTOR's expense without change in the Contract Price.

B. The Contract Price may only be changed by a Change Order. Any request for an adjustment in the Contract Price shall be based on written notice delivered within fourteen (14) calendar days after occurrence of the event giving rise to the request or within fourteen (14) calendar days after first recognition of the conditions giving rise to the request. Prior notice is not required for requests or claims relating to an emergency endangering life or property as described in Paragraph 6.16. Thereafter, the CONTRACTOR shall submit written documentation of its request, including appropriate supporting documentation, within ten (10) calendar days after giving notice, unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted.

C. The value of any Work covered by a Change Order or of any request for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by Unit Prices contained in the Contract Documents, by application of such Unit Prices to the quantities of the items involved (subject to the provisions of Paragraph 11.04); or

2. where the Work involved is not covered by Unit Prices contained in the Contract Documents, by a mutually agreed lump sum; or

3. where the Work involved is not covered by Unit Prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 11.01 C.2, on the basis of the Cost of the Work (determined as provided in Paragraphs 11.02 A and B) plus a CONTRACTOR's fee for overhead and profit (determined as provided in Paragraph 11.01 D).

D. The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.02 A.1 and 11.02 A.2, the CONTRACTOR's fee shall be ten percent (10%);

b. for costs incurred under Paragraph 11.02 A.3, the CONTRACTOR's fee shall be five percent (5%);

c. where one or more tiers of subcontracts are on the basis of the Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01 D.2 and 11.02 A.1 through A.3 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be paid a fee of ten percent (10%) of the costs incurred by such Subcontractor under Paragraphs 11.02 A.1 and 11.02 A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent (5%) of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.02 A.4, 11.02 A.5 and 11.02 B;

e. the amount of credit to be allowed by CONTRACTOR to CITY for any change which results in a net decrease in cost will be the amount of the actual net decrease in costs plus a deduction in CONTRACTOR's fee by an amount equal to five percent (5%) of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.01 D.2.a through 11.01 D.2.e, inclusive.

**E.** Whenever the Cost of the Work is to be determined pursuant to Paragraphs 11.02 A and B, CONTRACTOR shall establish and maintain records thereof in accordance with generally accepted accounting practices and submit in form acceptable to CITY an itemized cost breakdown together with supporting data.

## **11.02 Cost of the Work**

**A.** The term "Cost of the Work" means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a request for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the request. Except as otherwise agreed to in writing by CITY, costs covered by Change Orders or requests shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any costs itemized in 11.02 B:

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work, using occupational titles and job classifications agreed upon by CITY and CONTRACTOR. Such employees shall include, without limitation, job Site superintendents, foremen and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing the Work after regular working hours, on Saturdays, Sundays or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated into the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless CITY deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to CITY. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to CITY, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed or furnished by Subcontractors. If required by CITY, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to CITY who will then determine, with the advice of DESIGN PROFESSIONAL, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of the Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in Paragraphs 11.01 D and E and 11.02 A and B. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work when such services are approved in advance by CITY in writing.

5. Other costs including the following:

a. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value of such items used but not consumed which remain the property of CONTRACTOR.

c. Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by CITY with the advice of DESIGN PROFESSIONAL, and the costs of transportation, loading, unloading, installation, assembly, dismantling and removal thereof, all in accordance with the terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

d. Applicable sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws or Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses required to perform the Work.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by CITY in accordance with Article 5), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of CITY. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for those services a fee proportionate to that stated in Paragraph 11.01 D.2.

g. The cost of utilities, fuel and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage and similar petty cash items in connection with the Work.

i. Cost of premiums for additional or increased Bonds, or for insurance required because of approved changes in the Work.

**B. Costs excluded:** The term “Cost of the Work” shall not include any of the following:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the Site or in CONTRACTOR's principal or a branch office for general administration of the Work (if not specifically included in the agreed upon occupational titles and job classifications referred to in Paragraph 11.02 A.1 or specifically covered by Paragraph 11.02 A.4), all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials, or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 11.02 A.

### **11.03 Cash Allowances**

**A.** It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be furnished and performed for such sums as may be acceptable to CITY. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

**B.** Prior to final payment, an appropriate Change Order will be issued by CITY to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### **11.04 Unit Price Work**

**A.** Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made in accordance with Paragraph 9.06.

**B.** Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

**C.** CITY or CONTRACTOR may negotiate an adjustment of the price per unit of Unit Price Work stated in the Contract if:

1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs by twenty percent (20%) or more from the estimated quantity of such item indicated in the Contract; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or CITY believes that CITY is entitled to a decrease in Contract Price.

#### **11.05 Dispute Resolution**

A. If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price in accordance with Article 11 within fourteen (14) calendar days from the receipt of supporting documentation of the request pursuant to 11.01.B., unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted, then a Claim for such adjustment may be made pursuant to Article 16.

### **ARTICLE 12 CONTRACT TIMES**

#### **12.01 Time of the Essence**

A. All times stated in the Contract Documents are of the essence of the Contract.

#### **12.02 Change of Contract Times**

A. The Contract Times (or Milestones) may only be changed by a Change Order. Any request for an adjustment in the Contract Times shall be based on written notice delivered within fourteen (14) calendar days after occurrence of the event giving rise to the request or within fourteen (14) calendar days after first recognition of the conditions giving rise to the request. Thereafter, the CONTRACTOR shall submit written documentation of its requests, including appropriate supporting documentation, within ten (10) days after giving notice, unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted.

#### **12.03 Proof Required To Justify an Extension of Time For Excusable and Compensable Delays**

A. In support of any request for an extension of the Contract Times pursuant to this Article, CONTRACTOR must demonstrate to the reasonable satisfaction of the CITY that the critical path of the approved baseline project schedule was delayed. CONTRACTOR shall be entitled to an increase in contract time for the number of days that the critical path was delayed solely as a result of the compensable or excusable event. A compensable or excusable event includes, but is not limited to:

1. unreasonable delay of issuance of Notice to Proceed by CITY;
2. CITY's unreasonable delay of delivery furnished materials, equipment, or work;
3. unreasonable delay responding to shop drawings and submittals;
4. CITY's unreasonable delay in issuing a Change Order;
5. an order by the CITY to stop the Work where the CONTRACTOR was not at fault; and
6. other reasonable grounds as determined by the City in its sole discretion.

B. CONTRACTOR shall compare the critical path of the approved baseline project schedule to the actual critical path of the Work, identifying the specific impact of the compensable or excusable event.

C. CONTRACTOR shall submit to the CITY a written time impact analysis illustrating the influence of each compensable or excusable event on the date of Substantial Completion. The

time impact analysis shall demonstrate the time impact based on the date of the delay in time and the event time computations or all affected activities.

D. If the critical path of the Work is delayed by "Force Majeure", the CONTRACTOR shall be entitled only to an extension of the Contract Times for the number of days of delay to the critical path. For purposes of this paragraph, "Force Majeure" shall mean fire, tornado, flood, earthquake, war, act of terrorism, civil disturbance, or labor strikes away from the project site.

E. Extensions of contract time pursuant to the this section will be granted only to the extent that the time adjustments exceed the total float time available when the event causing the delay occurred.

#### **12.04 Delays Within CONTRACTOR's Control**

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

#### **12.05 Delays Beyond the CITY's and CONTRACTOR's Control**

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both CITY and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

#### **12.06 Delay Damages**

A. In no event shall CITY be liable to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR, or
2. delays beyond the control of CITY or CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this Paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inaction of CITY, DESIGN PROFESSIONAL, Consultant or anyone for whom CITY, DESIGN PROFESSIONAL or Consultant is responsible.

#### **12.07 Dispute Resolution**

A. If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Time in accordance with Article 12 within fourteen (14) calendar days from the receipt of supporting documentation of the request pursuant to 12.02, unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted, then a Claim for such adjustment may be made pursuant to Article 16.

### **ARTICLE 13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

#### **13.01 Access to Work**

A. CITY, DESIGN PROFESSIONAL, Consultants, other representatives and personnel of CITY, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the Site and Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

### **13.02 Tests and Inspections**

**A.** CONTRACTOR shall give DESIGN PROFESSIONAL and CITY's Representative timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

**B.** If any Work (or the work of others at the Site) that is to be inspected, tested or approved is covered by CONTRACTOR without written approval required by Paragraphs 13.02 D or 13.02 E, it must, if requested by CITY's Representative, be uncovered for observation.

**C.** Uncovering Work as provided in Paragraph 13.02 B, shall be at CONTRACTOR's expense unless CONTRACTOR has given DESIGN PROFESSIONAL and CITY's Representative timely notice of CONTRACTOR's intention to cover the same and DESIGN PROFESSIONAL and CITY's Representative have not acted with reasonable promptness in response to such notice.

**D.** If Laws or Regulations of any public body (including City) having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish DESIGN PROFESSIONAL and CITY's Representative the required certificates of inspection or approval.

**E.** CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for CITY's and DESIGN PROFESSIONAL's acceptance of materials or equipment to be incorporated into the Work, or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation into the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to CITY and DESIGN PROFESSIONAL.

**F.** CITY shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests or approvals covered by Paragraph 13.02 D and E;
2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04 B shall be paid as provided in said Paragraph 13.04 B; and
3. as otherwise specifically provided in the Contract Documents.

### **13.03 Notice of Defects**

**A.** Prompt notice of all defective Work of which either CITY or DESIGN PROFESSIONAL has actual knowledge will be given to CONTRACTOR. Defective Work may be rejected, corrected or accepted as provided in this Article 13.

### **13.04 Uncovering Work**

**A.** If any Work (or the work of others at the Site) is covered contrary to the written request of DESIGN PROFESSIONAL or CITY's Representative, it must, if requested by CITY's Representative, be uncovered for DESIGN PROFESSIONAL's or CITY's Representative's observation and replaced at CONTRACTOR's expense.

**B.** If CITY considers it necessary or advisable that covered Work be observed by DESIGN PROFESSIONAL or CITY's Representative or be inspected or tested by others, CONTRACTOR, at CITY's request, shall uncover, expose or otherwise make available for observation, inspection or testing as may be required, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction

(including but not limited to all costs of repair or replacement of work of others); and CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 16. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefore as provided in Article 16.

### **13.05 CITY May Stop the Work**

**A.** If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, CITY may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of CITY to stop the Work shall not give rise to any duty on the part of CITY to exercise this right for the benefit of CONTRACTOR, any Subcontractor, Supplier, other individual or entity or any surety or employee or agent of any of them.

### **13.06 Correction or Removal of Defective Work**

**A.** If required by CITY, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by either DESIGN PROFESSIONAL or CITY's Representative, remove it and replace it with Work that is not defective. CONTRACTOR shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

### **13.07 Correction Period**

**A.** If within one (1) year after the date of Substantial Completion, or such longer period of time as may be prescribed by Laws or Regulations, by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by CITY or permitted by Laws and Regulations as contemplated in Paragraph 6.10 is found to be defective, CONTRACTOR shall promptly, without cost to CITY and in accordance with CITY's written instructions:

1. correct the repair of damages to such land or areas; or
2. correct such defective Work, or if it has been rejected by CITY, remove it from the Site and replace it with Work that is not defective; and
3. satisfactorily correct or remove and replace any damage to other Work or to the work of others or damage to other lands or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in the event of an emergency where delay by CONTRACTOR would cause serious risk of loss or damage, CITY may have the defective Work corrected or the rejected Work removed and replaced, and all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

**B.** In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

**C.** Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder

with respect to such Work will be extended for an additional period of one (1) year, or such longer period of time as may be prescribed within Paragraph 13.07 A, after such correction or removal and replacement has been satisfactorily completed.

**D.** CONTRACTOR's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or waiver of the provisions of any applicable statute of limitation or repose.

### **13.08 Acceptance of Defective Work**

**A.** If, instead of requiring correction or removal and replacement of defective Work, CITY prefers to accept it, CITY may do so. CONTRACTOR shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to CITY's evaluation of and determination to accept such defective Work and shall pay OWNER for the diminished value of the Work. If any such acceptance occurs prior to DESIGN PROFESSIONAL's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work and, due to the diminished value of the Work, CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 16. If the acceptance of defective Work occurs after such recommendation, an appropriate amount shall be paid by CONTRACTOR to CITY.

### **13.09 CITY May Correct Defective Work**

**A.** If CONTRACTOR fails within a reasonable time after written notice from DESIGN PROFESSIONAL or CITY's Representative to correct defective Work or to remove and replace rejected Work as required by CITY in accordance with Paragraph 13.06, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, CITY may, after seven (7) days written notice to CONTRACTOR, correct and remedy any such deficiency.

**B.** CITY shall proceed expeditiously when exercising the rights and remedies under this Paragraph 13.09. In connection with such corrective and remedial action, CITY may exclude CONTRACTOR from all or part of the Site; take possession of all or part of the Work and suspend CONTRACTOR's services related thereto; take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site; and incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow CITY, CITY's Representative, agents and employees, CITY's other contractors, DESIGN PROFESSIONAL and Consultants access to the Site to enable CITY to exercise the rights and remedies under this Paragraph 13.09.

**C.** All costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by CITY in exercising such rights and remedies will be charged against CONTRACTOR and a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work; and CITY shall be entitled to an appropriate decrease in the Contract Price. If CITY and CONTRACTOR are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 16. Such Claims for costs, losses and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal and replacement of CONTRACTOR's defective or rejected Work.

**D.** CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by CITY of CITY's rights and remedies under Paragraphs 13.06 and 13.09.

## **ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION**

### **14.01 Schedule of Values**

A. 01290.02 Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into form 01290.01 Application for Payment acceptable to DESIGN PROFESSIONAL and CITY. Progress payments for Unit Price Work will be based on the number of units completed.

#### **14.02 Application for Progress Payments**

##### **A. Application for Payment**

1. At least twenty (20) days before the date stipulated in the Supplementary Conditions for each progress payment (but not more often than once a month), CONTRACTOR shall submit to DESIGN PROFESSIONAL for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated into the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, paid invoice or other documentation warranting that CITY has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect CITY's interest therein, all of which will be subject to CITY's approval.

2. Beginning with the second Application for Payment, each Application shall include:

a. an affidavit of CONTRACTOR stating that all previous progress payments received for the Work have been applied to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment, and

b. a copy of the most recent 00485.01 M/WBE Monthly Utilization Report CONTRACTOR has submitted to the CITY's Civil Rights and Equal Opportunity Department.

c. a copy of the most recent 00485.02 Project Workforce Monthly Report and 00485.03 Company-Wide Workforce Monthly Report CONTRACTOR has submitted to the OWNER's Civil Rights and Equal Opportunity Department.

d. an update to the approved schedule pursuant to paragraphs 6.04 and 6.05.

3. The amount of retainage with respect to progress payments will be stated in the Supplementary Conditions.

##### **B. Review of Applications**

1. DESIGN PROFESSIONAL will, within ten (10) days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to CITY, or return the Application to CONTRACTOR indicating in writing DESIGN PROFESSIONAL's reasons for refusing to recommend payment. In the latter case, CONTRACTOR shall make the necessary corrections and resubmit the Application.

a. After presentation of the Application for Payment to CITY, and if CITY's Representative agrees with DESIGN PROFESSIONAL's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02 B.4) become due and will be paid by CITY to CONTRACTOR, subject to the provisions of Laws or Regulations.

b. No payment shall be approved until the CONTRACTOR has submitted with the Application accompanying documentation as required by the Contract Documents, including, but not limited to, the documentation required by paragraphs 6.04 and 6.05.

2. DESIGN PROFESSIONAL's recommendation of any payment requested in an Application for Payment will constitute a representation by DESIGN PROFESSIONAL to CITY, based on DESIGN PROFESSIONAL's observations of the executed Work as an experienced and qualified DESIGN PROFESSIONAL and on DESIGN PROFESSIONAL's

review of the Application for Payment and the accompanying data and schedules, that to the best of DESIGN PROFESSIONAL's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.06, and to any other qualifications stated in the recommendation); and
- c. the conditions precedent to CONTRACTOR being entitled to such payment appear to have been fulfilled in so far as it is DESIGN PROFESSIONAL's responsibility to observe the Work.

3. DESIGN PROFESSIONAL's recommendation of any payment, including final payment, shall not mean that DESIGN PROFESSIONAL is responsible for CONTRACTOR's means, methods, techniques, sequence or procedures of construction, safety precautions and programs incident thereto, or any failure of CONTRACTOR to comply with Laws or Regulations applicable to the furnishing or performance of Work.

4. DESIGN PROFESSIONAL may refuse to recommend the whole or any part of any payment if, in DESIGN PROFESSIONAL's opinion, it would be incorrect to make the representations to CITY referred to in Paragraph 14.02 B.2. DESIGN PROFESSIONAL may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in DESIGN PROFESSIONAL's opinion to protect CITY from loss because:

- a. the Work is defective, or completed Work has been damaged requiring correction or replacement;
- b. the Contract Price has been reduced by Written Amendment or Change Orders;
- c. CITY has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. DESIGN PROFESSIONAL has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.

### **C. Reduction in Payment**

1. CITY may refuse to make payment of the full amount recommended by DESIGN PROFESSIONAL because:

- a. Claims have been made by third parties against CITY on account of CONTRACTOR's performance or furnishing of the Work; or
- b. Claims have been made by CITY against CONTRACTOR in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to CITY to secure the satisfaction and discharge of such Claims;
- c. there are other items entitling CITY to a set-off against the amount recommended; or
- d. CITY has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02 B.4.a through c or 15.02 A.1 through 4; but CITY must give CONTRACTOR written notice (with a copy to DESIGN PROFESSIONAL) stating the reasons for such action and promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by CITY and CONTRACTOR, when CONTRACTOR corrects to CITY's satisfaction the reasons for such action; or
- e. CITY has made a different determination of the actual quantities and classifications of Unit Price Work.

### **14.03 CONTRACTOR's Warranty of Title**

**A.** CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated into the Project or not, will pass to CITY no later than the time of payment, free and clear of all Liens.

### **14.04 Substantial Completion**

**A.** When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify CITY and DESIGN PROFESSIONAL in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that CITY issue a certificate of Substantial Completion. Within a reasonable time thereafter, CITY, together with CONTRACTOR and DESIGN PROFESSIONAL, shall make an inspection of the Work to determine the status of completion. If DESIGN PROFESSIONAL does not consider the Work substantially complete, DESIGN PROFESSIONAL will notify CONTRACTOR and CITY in writing giving the reasons therefore. If DESIGN PROFESSIONAL considers the Work substantially complete, DESIGN PROFESSIONAL will prepare and deliver to CITY a recommended certificate of Substantial Completion that shall establish the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. CITY shall have seven (7) days after receipt of the recommended certificate during which to make written objection to DESIGN PROFESSIONAL as to any provisions of the certificate or attached list. At the time of delivery of the recommended certificate of Substantial Completion, DESIGN PROFESSIONAL will deliver to CITY and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between CITY and CONTRACTOR with respect to security, operation, safety, protection of the Work, maintenance, heat, utilities, insurance and warranties and guarantees.

**B.** CITY shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but CITY shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

### **14.05 Partial Utilization**

**A.** Use by CITY at CITY's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which CITY, DESIGN PROFESSIONAL and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by CITY for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

1. CITY at any time may request CONTRACTOR in writing to permit CITY to use any such part of the Work which CITY believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to CITY and DESIGN PROFESSIONAL that such part of the Work is substantially complete and request CITY to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify CITY and DESIGN PROFESSIONAL in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request CITY to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, CITY, together with CONTRACTOR and DESIGN PROFESSIONAL, shall make an inspection of that part of the Work to determine its status of completion. If DESIGN PROFESSIONAL does not consider that part of the Work to be substantially complete, DESIGN PROFESSIONAL will notify CITY and CONTRACTOR in writing, giving the reasons therefore. If DESIGN PROFESSIONAL considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of Paragraph 5.09 with respect to property insurance.

#### **14.06 Final Inspection**

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, DESIGN PROFESSIONAL will make a final inspection with CITY and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### **14.07 Final Payment**

##### **A. Application for Payment**

1. After CONTRACTOR has completed all corrections required by Paragraph 14.06 to the satisfaction of DESIGN PROFESSIONAL and CITY's Representative and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by Paragraph 5.04, certificates of inspection, marked-up record documents (as provided in Paragraph 6.13) and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation required by the Contract Documents, including but not limited to the evidence of insurance required by Subparagraph 5.04 B.7; and

b. 01290.14 "Contractor Affidavit for Final Payment" from CONTRACTOR and 01290.15 "Subcontractor Affidavit for Final Payment" from all Subcontractors, regardless of tier.

##### **B. Review of Application and Acceptance**

1. If, on the basis of DESIGN PROFESSIONAL's and CITY's Representative's observation of the Work during construction and final inspection, and DESIGN PROFESSIONAL's and CITY's Representative's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, DESIGN PROFESSIONAL and CITY's Representative are satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, DESIGN PROFESSIONAL will, within ten (10) days after receipt of the final Application for Payment, indicate in writing DESIGN PROFESSIONAL's and CITY's Representative's recommendation of payment and present the Application to CITY for payment. At the same time DESIGN PROFESSIONAL will also give written notice to CITY and CONTRACTOR that the Work is acceptable subject to the provisions of Paragraph 14.09.

2. Otherwise, DESIGN PROFESSIONAL will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application to DESIGN PROFESSIONAL. After the presentation to CITY of the Application and accompanying documentation, in appropriate form and substance, including applicable federal and state prevailing wage provisions, and with DESIGN PROFESSIONAL's recommendation and notice of acceptability, the amount recommended by DESIGN PROFESSIONAL will become due and will be paid by CITY to CONTRACTOR in accordance with Laws and Regulations.

#### **14.08 Final Completion Delayed**

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if DESIGN PROFESSIONAL so recommends and CITY concurs, CITY shall, upon

receipt of CONTRACTOR's final Application for Payment and recommendation of DESIGN PROFESSIONAL, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by CITY for Work not fully completed or corrected is less than the retainage stipulated in the Supplementary Conditions, and if Bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to DESIGN PROFESSIONAL with the Application for Payment. Payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

#### **14.09 Waiver of Claims**

**A.** The making and acceptance of final payment will constitute:

1. a waiver of all claims by CITY against CONTRACTOR, except claims previously made in writing and still unsettled, or claims arising from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against CITY other than those previously made in writing pursuant to Paragraphs 16.02 and 16.03 and still unsettled.

#### **14.10 Completion of Work by CITY**

**A.** If CITY must complete the Work, all costs and charges incurred by CITY, together with the cost of completing the Work under the Contract, will be deducted from any monies due or which may become due CONTRACTOR. If such expense exceeds the sum which would have been payable under the Contract, then CONTRACTOR and the surety shall be liable and shall pay to CITY the amount of such excess.

### **ARTICLE 15 SUSPENSION OF WORK AND TERMINATION**

#### **15.01 CITY May Suspend Work**

**A.** Notwithstanding any other provision of this Contract, at any time and without cause, and at its sole and absolute discretion, CITY, may suspend the Work or any portion of the Work by written notice to CONTRACTOR, which will initially fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed in the notice unless the date is changed by a subsequent written notice from CITY. CONTRACTOR may be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any suspension if CONTRACTOR makes a Claim therefore in accordance with Article 16.

**B.** CONTRACTOR will not be allowed an adjustment in the Contract Price or an extension of the Contract Times if CITY suspends the Work because CONTRACTOR's acts or omissions create or cause an emergency that CITY believes affects the safety or protection of persons, the Work, or property at the Site or adjacent thereto. CITY may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been adequately addressed by CONTRACTOR; however, this right of CITY to stop the Work shall not give rise to any duty on the part of CITY to exercise this right for the benefit of CONTRACTOR, any Subcontractor, Supplier, other individual or entity or any surety or employee or agent of any of them.

#### **15.02 CITY May Terminate for Default**

**A.** CONTRACTOR may be deemed in default and CITY may terminate the services of CONTRACTOR upon the occurrence of any one or more of the following events:

1. CONTRACTOR fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under Paragraph 2.06 and 2.07 as adjusted from time to time pursuant to Paragraphs 6.04, 6.05, 12.02 and 12.03);

2. CONTRACTOR abandons the Work or declares its intention to abandon the Work;
3. CONTRACTOR assigns or attempts to assign its rights or obligations under this Contract or any part thereof to any third party without the prior written consent of CITY;
4. CONTRACTOR fails to make prompt payment duly owing to any subcontractor for Work completed in accordance to the Contract Documents or material supplier for materials delivered for incorporation into the Work within thirty (30) calendar days after payment was due;
5. CONTRACTOR fails to achieve the required dates of substantial and final completion;
6. CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;
7. CONTRACTOR disregards the authority of DESIGN PROFESSIONAL or OWNER;  
or
8. CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents.

**B.** CITY may, after giving CONTRACTOR (and the surety) seven (7) days written notice and to the extent permitted by Laws or Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment and machinery at the Site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid CONTRACTOR but which are stored elsewhere, and finish the Work as CITY may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CITY arising out of or resulting from completing the Work, such excess may be paid to CONTRACTOR. If such costs, losses and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to CITY within fourteen (14) calendar days of CITY'S demand for payment. When exercising any rights or remedies under this Paragraph CITY shall not be required to competitively bid this work unless required by law.

**C.** Where CONTRACTOR's services have been so terminated by CITY, the termination will not affect any rights or remedies of CITY against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by CITY will not release CONTRACTOR from liability.

**D.** If, after a default termination, it is determined that the CONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the CITY. The CITY shall then be liable to CONTRACTOR for only those costs enumerated in paragraph 15.03.

### **15.03 CITY May Terminate for Convenience**

**A.** Notwithstanding any other provision of this Contract, upon seven (7) calendar days written notice to CONTRACTOR, CITY may, at its sole and absolute discretion, without cause and without prejudice to any other right or remedy of CITY, elect to terminate the Contract. In such case, CONTRACTOR shall, with thirty (30) calendar days of receiving notice of termination under this paragraph, submit to CITY its statement of costs and expenses and shall be paid:

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

4. for reasonable expenses directly attributable to termination if approved in advance by CITY.

**B.** CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

**C.** CONTRACTOR waives any costs not submitted to CITY pursuant to paragraph 15.03.A.

**D.** CITY shall, within thirty (30) calendar days after receipt of CONTRACTOR's statement, pay CONTRACTOR all amounts it determines are properly determined.

## **ARTICLE 16 CLAIMS AND DISPUTES**

### **16.01 Definition**

**A.** A Claim is a demand or assertion by the CONTRACTOR seeking, as a matter of right, the adjustment of Contract price and/or times with respect to the terms of the Contract.

### **16.02 Written Notice and Burden of Proof**

**A.** Claims must be made by written notice pursuant to Paragraph 17.01. The written notice shall clearly indicate that the CONTRACTOR is making a claim. The responsibility to substantiate Claims shall rest with the CONTRACTOR. No Claim may be made under this Contract except as provided in this Article.

**B.** Certification of Claim: The written notice of Claim shall include the following statement signed by the CONTRACTOR's representative: "The CONTRACTOR certifies that all statements made and the facts set out in this claim are true and correct and that no false records have been submitted in support of this claim." **Strict compliance with this paragraph shall be a condition precedent to the creation, existence or validity of any Claim.**

### **16.03 Time Limits on Claims**

**A.** The CONTRACTOR must give notice to the CITY within fourteen (14) calendar days after the denial of a request for or failure to reach an agreement on a change in Contract Price and/or change in Contract Time pursuant to Article 11 and Article 12 respectively. After the fourteen (14) day period for making Claims has expired, the Claim shall be considered waived.

**B.** The CONTRACTOR shall submit the Claim to the CITY's Representative.

### **16.04 Continuing Contract Performance**

**A.** Pending final resolution of a Claim, unless otherwise agreed in writing, the CONTRACTOR shall proceed diligently with performance of the Work and the CITY shall continue to make payments in accordance with the Contract Documents. The CITY may, but is not obligated to, notify the Surety of the nature and amount of the Claim.

### **16.05 Injury or Damage to Person or Property**

**A.** If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts that party is legally liable, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding thirty (30) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter.

### **16.06 Initial Resolution of Claims and Disputes**

**A.** After the CONTRACTOR has submitted the Claim to the CITY'S Representative, the CITY'S Representative and CONTRACTOR'S Representative shall conduct a settlement conference within fourteen (14) calendar days from the date of receipt of the Claim. If the Claim is not settled within seven (7) calendar days following the date of the settlement conference, the CITY'S Representative and the CONTRACTOR's Representative shall state, in writing, following the conclusion of the seven (7) calendar day period, their respective position as to the matters in dispute.

**B.** The CITY'S and CONTRACTOR'S statement of positions shall state all known factual grounds for each party's position. If the dispute remains unresolved at the end of the seven (7) calendar days from submission of the parties' written position statements, the CONTRACTOR shall have the right to proceed with the pursuit of Claims pursuant to paragraph 16.07.

**C.** If a Claim has been resolved, the OWNER will prepare or obtain appropriate documentation.

#### **16.07 Final Resolution of Claims and Disputes**

**A.** All administrative procedures set forth in this contract must first be exhausted before suit is filed.

**B.** If the CITY'S Representative and the CONTRACTOR'S Representative are unable to resolve the dispute pursuant to 16.06, the parties must submit their statements of position to the Director, who shall review the Claim and make a decision within fourteen (14) calendar days.

**C.** Absent fraud, gross mistake or bad faith, the Director's decision shall be final and binding on CITY and CONTRACTOR within fourteen (14) calendar days after issuance. The CONTRACTOR shall give written notice to the CITY stating its intent to submit its Claim to a court of law pursuant to paragraph 17.05.A. within thirty (30) calendar days after notice of Director's decision.

**D.** The time frames for the Director's decision and for CONTRACTOR'S written notice of intent may be tolled by participation in voluntary mediation. Mediator selection and the procedures to be employed in voluntary mediation shall be mutually acceptable to the parties. Costs of the mediator shall be shared equally among the parties participating in the mediation. In no event shall any time frame be tolled more than 30 days for mediation. However, mediation may be employed at any time at the discretion and mutual agreement of the parties.

**E.** If the dispute is not resolved during voluntary mediation, The CONTRACTOR agrees that it will file no suit based on facts or evidentiary materials that were not presented for consideration to the CITY during the mediation process or of which the CONTRACTOR had knowledge and failed to present during the administrative procedures.

### **ARTICLE 17 MISCELLANEOUS**

#### **17.01 Giving Notice**

**A.** Whenever any provision of the Contract Documents requires the giving of written notice, it will be given by personal delivery, by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice or by confirmed electronic facsimile transmission. Notice is effective on the date of personal delivery, deposit of registered or certified mail, postage prepaid, or confirmed electronic facsimile transmission.

#### **17.02 Computation of Times**

**A.** When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last calendar day of such period. If the last day of such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

#### **17.03 Cumulative Remedies**

**A.** The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the

warranties, guarantees and obligations imposed upon CONTRACTOR and all of the rights and remedies available to CITY and DESIGN PROFESSIONAL hereunder are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

#### **17.04 Survival of Obligations**

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract.

#### **17.05 Controlling Law**

A. This Contract shall be construed and governed in accordance with the laws of the State of Missouri without giving effect to Missouri's choice of law provisions. The CITY and CONTRACTOR: (1) shall submit exclusively to the jurisdiction of the state and federal courts located in Jackson County, Missouri and no other; (2) shall waive any and all objections to jurisdiction and venue; and (3) shall not raise forum non conveniens as an objection to the location of any litigation.



## ADDENDUM NUMBER 2

Project Number 8000977/9618

Project Title Prospect Elevated Water Storage Tank

ISSUE DATE: February 28, 2023

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on March 14, 2023, are amended as follows:

Questions from Bidders The following is provided to respond to Bidders questions:

Q1	What building or construction permits will the Contractor need to obtain for this project? Will a Building Permit be required from the city or county? If so, whom do we contact to determine what is the cost? Are there any other licenses or fees that the Contractor must pay for? Will the cost of the Building Permit be waived since it is a municipal project?
A1	<b>Permit requirements are defined in Section 00700 Construction General Conditions, Paragraph 6.09 Permits. This City doesn't require building permits for utility structures.</b>
Q2	How is this project being funded?
A2	<b>KC Water will be funding this project from bonds, not SRF or federal funding.</b>
Q3	What is the budget for this project?
A3	<b>This budget information will not be shared until after the bid opening.</b>
Q4	Who is on the planholders list?
A4	<b>The list of everyone who has accessed the plan room can be found by visiting the Project Activity link for the project on the plan room website.</b>
Q5	Is this project exempt from state and local taxes?
A5	<b>Yes. Information related to the City's sales tax exemption is included following Section 00515.</b>
Q6	Is there any 3 <sup>rd</sup> party inspection on engineering construction or painting? If so, who will it be and on what portion of the work?
A6	<b>Yes. Third party inspection (and Resident Project Representative services) will be provided throughout all phases of construction by the KC Water's Design Professional team, Burns &amp; McDonnell and their subs, as well as KC Water staff.</b>
Q7	We have noted the buy American and Missouri preference. Is there any SRF requiring BABA, AISA, or Buy American?
A7	<b>No specific requirements other than what is listed under Section 00210 Instructions</b>

	<b>to Bidders, paragraph 13 - City's Buy American and Missouri Preference Policies</b>
Q8	Does the safety representative need to be directly employed by the contractor or can it be a designated subcontractor?
A8	<b>The contractor's safety representative does not need to be directly employed by the contractor, but the representative should be engaged consistently throughout the project and not change without written approval from the KC Water PM.</b>
Q9	Spec 33 16 11, Page 10, Part 2.09.M.2.g requires a conical weir. Is a rectangular weir box an acceptable alternate?
A9	<b>No, a rectangular weir is not an acceptable alternate.</b>
Q10	Spec 33 16 11, Page 18, Part 3.04.A.7.b seems to imply that once a concrete lift in the tower is poured, the next lift cannot be placed until the 7-day concrete strength tests are obtained. Is this the actual intent of this section?
A10	<b>This section defines what is considered Low Strength Concrete and does not define the means and methods for construction. The contractor will decide when they wish to proceed with additional lifts. If the 7-day strength does not meet the requirements, the low strength concrete may be requested to be removed per Part 3.04.A.7.c. of that section.</b>
Q11	Spec 33 16 11, Part 2 states that the tank diameter is to be "coordinated with the Tank Erector" while dwg sheet 12 indicates a tank diameter of 115 feet and a straight wall shell height of 45 feet (based on the logo stretchout). Drawing sheet 12 further indicates teardrop logos at a height of 30 feet. Standard geometry for this capacity tank meeting the specified head range requirement would be 110 feet diameter x 29 feet straight wall height which will not allow for a 30 ft logo. Please confirm that it is acceptable to use our standard geometry while scaling down the teardrop logo accordingly to fit.
A11	<b>The tank's geometry may vary by manufacturer provided that all requirements in the specifications are met. The related logo size, color, and graphics on the tank will change to a version of KCMO's fountain logo, as directed and confirmed by KC Water during shop drawing review.</b>
Q12	Please confirm the mechanism to access the directory of registered MWDBE entities on the City's website.
A12	<b>The City's Civil Rights and Equal Opportunity Department (CREO) maintains a directory of information that can be accessed via the City's CREO KC website at <a href="https://www.kcmo.gov/city-hall/departments/human-relations">https://www.kcmo.gov/city-hall/departments/human-relations</a> and <a href="https://kcmohrd.mwdbe.com/">https://kcmohrd.mwdbe.com/</a></b>
Q13	Can you provide rim and flowline elevations for the sanitary sewer that is shown on the yard piping plan on sheet C004?
A13	<b>A table of these rim and pipe invert elevations at the sanitary manholes is attached.</b>

Attachments:

- Pre-bid meeting attendance list
- Sewer manhole piping inverts

Bidding Requirements:

- 1) Delete and Replace the Following:
  - a) Delete Form 00130 Invitation to Bid and Replace with the attached Form 00430.
  - b) Delete 00440 HRD Instruction and replace with the attached 00440 CREO Instructions.
  - c) Delete Form 00450 CUP and Request for Waiver and replace with the attached Form 00450 CUP and Waiver Request
  - d) Delete Form 00450.01 Letter of Intent to Subcontract and replace with the attached Form 00450.01 Letter of Intent to Subcontract.
  - e) Delete Form 00460 Timetable for MBE WBE Utilization and Replace with the attached Form 00460 Timetable for MBE WBE Utilization.
  - f) Delete Form 00470 Request for Modification or Substitution and Replace with the attached Form 00470 Request for Modification or Substitution.
  - g) Delete 5060 MO Dept of Revenue and replace with the attached MO Dept of Revenue.
- 2) Delete the Following:
  - a) Delete Form 00412 Unit Prices.

Specifications

1. Supplementary Conditions 00800 - Delete and replace paragraph SC-12.01, subparagraph B.2. related to final completion and payment with the following:
  - a. The Work shall be completed and ready for final payment in accordance with Paragraph 14.07 within **180 Calendar Days** after the date of Substantial Completion of the Work.

**NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the Bid Form - Document 00410.**

**ATTENDANCE LIST**

**Meeting title** Pre Bid meeting Prospect Elevated Water Tank Storage  
**Start time** 2/21/23, 3:00 PM  
**End time** 2/21/23, 4:00 PM

<b>Name</b>	<b>Company</b>	<b>Email</b>
Reddy, John	KC Water	John.Reddy@kcmo.org
Huck, Deron	Burns & McDonnell	dhuck@burnsmcd.com
Johnson, Valerie	KC CREO	Valerie.Johnson@kcmo.org
Lantis, Shawn	CB&I, McDermott	Shawn.Lantis@mcdermott.com
Lucke, Jarrek	KC Water	Jarrek.Lucke@kcmo.org
Heidrick, Jeffrey	Burns & McDonnell	jheidrick@burnsmcd.com
Atkinson, Bridgette	KC Water	bridgette.atkinson@kcmo.org
Gregory L Hansen	Sherwin Williams	Greg.L.Hansen@sherwin.com
Corey O'Neill	MegaKC	coneill@megakc.com
Herrera, Christopher	KC Water	Chris.Herrera@kcmo.org
Rick A. Smith	Caldwell	rsmith@caldwelltanks.com
Kris Johnson	SheDigsIt	kris@shedigsit.com
Burruss, Cory	KCMO General Services	Cory.Burruss@kcmo.org
Everette, Darrell	KCMO General Services	Darrell.Everette@kcmo.org
Herring, Brent	KC Water	Brent.Herring@kcmo.org
Jones, Steven M	KC Water	Steven.M.Jones@kcmo.org
Yager, Joe	Goodwin Brothers	jyager@goodwinbros.com
Redecker, Adam	Goodwin Brothers	aredecker@goodwinbros.com
Hoover, Dave	Goodwin Brothers	dhoover@goodwinbros.com
Monske, Eric	Caldwell	emonske@caldwelltanks.com
Werling, Bob	Landmark	bwerling@teamlanmark.com
Bright, Terry	Mark One Electric	phone 816-215-0620
Budke, Dillon	Mark One Electric	phone 816-447-1314

**STORM & SANITARY STRUCTURE TABLE - KC Water Prospect Elevated Tank Site**

STRUCTURE NUMBER		TOP ELEVATION	FLOWLINE IN	FLOWLINE OUT	PIPE ELEVATION	SIZE	PIPE MATERIAL	STRUCTURE NOTES
KCMO ATLAS	TREKK PT #							
	4162	964.31	SOUTH		956.02	4"	PVC	4' CONC
				NW	955.70	6"	PVC	IN SOUTH FROM BLDG
	4163	962.26	SE		954.97	6"	PVC	4' CONC
				NORTH	954.65	6"	PVC	
	4139	949.27	SOUTH		943.88	6"	PVC	4' CONC
				NORTH	943.48	6"	PVC	



## INVITATION TO BID

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

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The KC Water Department of Kansas City, Missouri will receive sealed Bids until 2:00 PM, on Tuesday, **March 14, 2023** at 4800 E. 63<sup>rd</sup> St. Trfwy, Kansas City, MO 64130 for **Project/Contract Number: 80001977/9618 – Prospect Elevated Water Storage Tank**. Bids will be opened after that time.

City desires that Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) have a maximum opportunity to participate in the performance of City contracts. The goals for this specific Project are **(7%) MBE** participation and **(4%) WBE** participation.

Bidding Documents will be available online to all interested parties at the Kansas City, Missouri Plan Room, <http://www.kcmoplanroom.org>. All addenda will be posted at this location. Any document or plan may be viewed or downloaded from this location.

Bidders are requested to attend the **Mandatory**, Pre-Bid Conference at **3:00 PM, Tuesday February 21<sup>st</sup>, 2023**, at Water Services Department Auditorium **4800 E 63<sup>rd</sup> Street Trfwy**

Project Manager: John Reddy  
Phone Number: (816) 513-0377  
Fax Number: (816) 513-0343  
E-mail: [John.Reddy@kcmo.org](mailto:John.Reddy@kcmo.org)

Contract Administrator: Bridgette Atkinson  
Phone Number: 816-513-0177  
Fax Number: 816-513-0543  
E-mail: Bridgette.Atkinson@kcmo.org

View all procurement and contracting opportunities at <http://www.kcmo.gov>

**CREO KC INSTRUCTIONS  
FOR CONSTRUCTION CONTRACTS**

**PART A. ECONOMIC EQUITY & INCLUSION GOALS--MBE/WBE PROGRAM**

**I. City's Economic Equity & Inclusion Goals--MBE/WBE Program.**

- A. The City has adopted an Economic Equity & Inclusion Goals--Minority/Women Business Enterprise ("MBE/WBE") Program (Sections 3-421 through 3-469, Code of Ordinances) (the "Program") to implement the City's policy of supporting the fullest possible participation in City contracts and change orders of firms owned and controlled by minorities and women. Each construction contract may have an MBE and/or WBE goal for participation. An MBE or WBE goal is a numerical objective the City has set for the contract that may be awarded pursuant to these bid specifications. Goals are stated as a percentage of contract dollars. For example, if an MBE goal for a contract is 10% and a Bidder submits a bid of \$100,000, the goal for MBE participation would equal \$10,000. The specific MBE/WBE goals on this contract are set forth elsewhere in the bid specifications.
- B. These Civil Rights & Equal Opportunity Department ("CREO KC") Forms & Instructions are part of the BIDDING DOCUMENTS and CONTRACT DOCUMENTS as defined in the General Conditions. By submitting a Bid, the Bidder agrees, as a material term of the contract, to carry out the City's MBE/WBE Program by making good faith efforts to include certified MBE/WBEs in the contract work to the extent of the goals listed for the contract and to the fullest extent consistent with submitting the lowest and best bid to the City. Bidder agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Bidder in fact meet or exceed both the MBE and WBE Goals, it is a requirement for approval of the Bid that a Bidder objectively demonstrate to the City that good faith efforts have been made to meet the Goals. Bidders must attempt to meet both the MBE and WBE goals and request a waiver if either is not met.
- C. The following CREO KC Forms are attached and must be used for MBE/WBE submittals:
1. Contractor Utilization Plan/Request for Waiver (CREO KC Form 8); and
  2. Letter of Intent to Subcontract (CREO KC Form 00450.01); and
  3. Timetable for MBE/WBE Utilization (CREO KC Form 10); and
  4. Request for Modification or Substitution (CREO KC Form 11); and
  5. Contractor Affidavit for Final Payment (Form 01290.14); and
  6. Subcontractor Affidavit for Final Payment (Form 01290.15).

Warning: The City only gives MBE/WBE credit for a Bidder's use of City certified MBE/WBEs. A certified MBE/WBE firm is a firm that has been certified by the City's Civil Rights & Equal Opportunity Department as such. An MBE/WBE firm must be certified before the date on which the contractor utilization plan is due. Certified MBEs and WBEs are listed in the M/W/DBE Kansas City Mo. Online Directory, which is available on the City's website at [www.kcmo.org](http://www.kcmo.org). Before a Bidder submits a bid, Bidder



should contact CREO KC and consult the directory to make sure any firm proposed for use for MBE/WBE participation has been certified.

## **II. Required Submissions Following Bid Opening.**

A. Bidder must submit the following documents within forty-eight (48) hours of bid opening:

1. **Contractor Utilization Plan/Request for Waiver (CREO KC Form 8).** This form states a Bidder's plan to use specific certified MBE/WBEs in the performance of the contract and includes the following:
  - a. The work to be performed by each MBE/WBE and the amounts each is to be paid for the work; and
  - b. The name, address, race or ethnic origin, gender and employer identification number or social security number of each MBE/WBE that will perform the work.
  - c. An automatic request for waiver in the event Bidder has not met or exceeded the MBE and/or WBE goals for the contract but believes that it has made good faith efforts to meet or exceed the goals and desires a waiver of the goals. If a waiver is requested, CREO KC will examine the Bidder's documentation of good faith efforts and make a recommendation to grant or deny the waiver. CREO KC will recommend a waiver be granted only if the Bidder has made good faith efforts to obtain MBE/WBE participation.
2. **Letter(s) of Intent to Subcontract (CREO KC Form 00450.01).** A letter must be provided from each MBE/WBE listed on the Contractor Utilization Plan. These letters verify that the MBE/WBE has agreed to execute a formal agreement for the work and indicate the scope of work to be performed and the price agreed upon for the work.

## **III. Required Submission when Requested by City.**

A. Bidder must submit the following documents when requested by City:

1. **Timetable for MBE/WBE Utilization (CREO KC Form 10).**
2. **Documentation of good faith efforts.**

## **IV. Required Monthly Submissions during term of Contract.**

A. Bidder must submit the following report on a monthly basis if awarded the contract:

1. **M/WBE Monthly Utilization Report.** This report must be submitted to the Director by the 15<sup>th</sup> of each month. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications. The method of submission of this report is through the B2GNow Diversity Management System (B2GNow).

## **V. Required Submittals for Final Contract Payment.**

A. Contractor must submit the following documents with its request for final payment under

the contract:

1. **Contractor Affidavit for Final Payment (Form 01290.14)**
2. **Subcontractor Affidavit(s) for Final Payment (Form 01290.15)**
3. **Final B2GNow Monthly Contract Audit Report with all payment audits confirmed.**

#### **VI. Additional Submittals.**

- A. Contractor may be required to make additional submittals during the term of the Contract, including **Request for Modification or Substitution (CREO KC Form 11)**. Refer to Section IX, Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE, for additional instructions on when this form must be submitted.

#### **VII. MBE/WBE Participation Credit.**

- A. The following shall be credited towards achieving the goals:
1. The total contract dollar amount that a prime contractor has paid or is obligated to pay to a subcontractor that is a certified MBE or WBE, except as otherwise expressly provided for herein.
  2. The total contract dollar amount that a prime contractor that is a certified MBE or WBE performed itself.
  3. Sixty percent (60%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supplier who is a certified MBE or WBE.
  4. Ten percent (10%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supply broker who is a certified MBE or WBE.
  5. One hundred percent (100%) of the total dollar amount paid or to be paid by a prime contractor to a manufacturer of construction supplies who is a certified MBE or WBE.
  6. Subcontractor participation with a lower tier MBE/WBE subcontractor using one of the above methods of participation.
- B. **NO CREDIT**, however, will be given for the following:
1. Participation in a contract by a MBE or WBE that does not perform a commercially useful function as defined by the Program; and
  2. Any portion of the value of the contract that an MBE or WBE subcontractor subcontracts back to the prime contractor or any other contractor who is not a qualified MBE/WBE; and
  3. Materials and supplies used on the contract unless the MBE/WBE is responsible for negotiating the price, determining quality and quantity, ordering the materials and installing (where applicable) and paying for material itself; and
  4. Work performed by an MBE or WBE in a scope of work other than that in which the MBE or WBE is currently certified.



## **VIII. Methods for Securing Participation of MBE/WBEs and Good Faith Efforts.**

- A. A bidder is required to make good faith efforts to achieve the MBE/WBE goals. Good faith efforts are efforts that, given all relevant circumstances, a Bidder actively and aggressively seeking to meet the goals can reasonably be expected to make. Good faith efforts must be made before the Bidder submits a Contractor Utilization Plan, in other words, within 48 hours of bid opening. However, efforts made to increase participation of MBEs and WBEs following submission of the CUP can be considered as evidence of good faith efforts to meet the goals.
- B. In evaluating good faith efforts, the Director of CREO KC will consider whether the Bidder has performed the following, along with any other relevant factors:
1. Advertised for at least 15 calendar days prior to the bid or proposal due date opportunities to participate in the contract in general circulation media, trade and professional association publications, small and minority business media, and publications of minority and women's business organizations which are included in a list along with their current contact information identified on the directory as the list of publications available to publish such advertisements, which list shall be updated by CREO KC no less than every three (3) month.
  2. Sent written notices at least fifteen (15) calendar days prior to the bid or proposal due date containing the information required in section (9) below, by certified mail, e-mail, or facsimile, to at least 80% of MBEs and WBEs which are included in a list along with their contact information identified on the directory as the list of organizations available to receive such notices, which list shall be updated by CREO KC no less than every three (3) months.
  3. Sent written notices, containing the information required by section (9) below, by certified mail, e-mail or facsimile, to at least 80% of MBEs and WBEs listed on the directory certified in the applicable scopes of work for the particular bid soliciting their participation in the contract at least 15 calendar days prior to the bid or proposal due date.
  4. Attempted to identify portions of the work for qualified MBE and/or WBE participation in order to increase the likelihood of meeting the goals, including breaking down contracts into economically feasible units that take into consideration the capacity of available MBE/WBEs appearing on the CREO KC directory.
  5. At any time prior to submission of the CUP or submittal of a request for modification of a CUP, requested assistance in achieving the goals from the Director and acted on the Director's recommendations.
  6. Conferred with certified MBEs and WBEs which inquired about or responded to the bid solicitation and explained to such MBEs and WBEs the scope and requirements of the work for which their bids or proposals were solicited, and if not all certified MBEs and WBEs in the particular scopes listed on the directory have inquired about or responded to the bid solicitation for each scope of work, then contact by certified mail, e-mail or telephone the greater of ten (10) or 80% of additional certified MBEs and WBEs in the particular scopes of work listed on the directory and offer to confer with such MBEs and WBEs for such particular scope of work and request such MBEs

and WBEs to submit a proposal.

7. Attempted to negotiate in good faith with certified MBEs and WBEs which responded to the bid solicitation or those certified MBEs and WBEs that were conferred with as contemplated in section (6) above, and other qualified MBEs and WBEs, at the option of the bidder, proposer, or contractor, as applicable, to perform specific subcontracts, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities by the bidder, proposer, or contractor; in the event an MBE or WBE is the low bid, but rejected as unqualified, the bidder, proposer, or contractor and the director or board, as applicable, shall provide sound reasons for rejecting such MBE or WBE.
8. Attended pre-bid meeting when such meetings were indicated in the solicitation of bids or otherwise by the bidder, proposer, or contractor, as applicable or by the director provided the director provides written direction to the bidder, proposer, or contractor at the time the goals are recommended.
9. Written notices and advertisements to be provided pursuant to sections (1), (2) and (3) above shall include the following information:
  - a. The bid due date;
  - b. The name of the project;
  - c. The address or general location of the project;
  - d. The location of plans and specifications for viewing;
  - e. Contact information of the prime contractor;
  - f. A general description of the scopes of work that are the subject of the solicitation;
  - g. The goals established for the applicable contract, and if the goals are still subject to board approval, then a statement that the goals as stated are preliminary and are subject to board approval;
  - h. If the project or any portion of the project is subject to prevailing wage then a statement that all or a portion of the project will be subject to prevailing wage, as applicable; and if only a portion of the scopes are subject to prevailing wage, then identification of such scopes provided that such scopes are known as of the time of bid solicitation;
  - i. The date and time of any pre-bid meeting(s), if any, which have been scheduled by the bidder, proposer, contractor or developer as of the bid solicitation; and

Any other information deemed relevant by the bidder, proposer, contractor or developer, as applicable, or the director to the extent the director provides written direction to the bidder, proposer, contractor or developer of such additional information at the time the goals are recommended by the director. 8. Within five (5) working days after drawing the bid specifications, sent certified letters, verifiable e-mails or proof of facsimiles to certified MBEs and WBEs listed in the M/W/DBE Kansas City Mo. Online Directory.

- C. A Bidder may be required to give the City documentation to prove that it made good faith efforts. The Bidder will be contacted by the City with further instructions about when this documentation must be submitted.

#### **IX. Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE.**

- A. After bid opening, a Bidder or Contractor may need to substitute an MBE and/or WBE or request that the amount of MBE/WBE participation listed in its Contractor Utilization Plan be modified. Bidder or Contractor must file a **Request for Modification or Substitution (CREO KC Form 11) prior to actual substitution and within a reasonable time after learning that a modification or substitution is necessary.** The Director may approve substitutions or modifications and upon approval, the modifications and substitutions will become an amendment to the Contractor Utilization Plan. Modifications or substitutions may be approved when:
  - 1. The Director finds that the Bidder or Contractor made and provided evidence of good faith efforts to substitute the MBE/WBE listed on the Contractor Utilization Plan with other certified MBE/WBEs for the scope of work or any other scope of work in the contract; and
  - 2. The Bidder or Contractor has not attempted intentionally to evade the requirements of the program and it is in the best interests of the City to allow a modification or substitution; and
  - 3. The Director also finds one of the following:
    - a. The listed MBE/WBE is non-responsive or cannot perform; or
    - b. The listed MBE/WBE has increased its previously quoted price to the bidder, proposer or contractor without a corresponding change in the scope of the work; or
    - c. The listed MBE/WBE has committed a material default or breach of its contract with the contractor; or
    - d. Requirements of the scope of work of the contract have changed and render subcontracting not feasible or not feasible at the levels required by the goals established for the contract; or
    - e. The listed MBE/WBE is unacceptable to the contracting department; or
    - f. The listed MBE/WBE thereafter had its certification revoked; or
- B. A modification shall not be made unless the modification or substitution has first been requested and approved by the Director. Once a modification has been made, a Construction Contractor Employee Identification Report (CREO KC Form 0485.04) for the newly approved subcontractor must be submitted at least ten (10) days prior to the approved subcontractor commencing work on a City contract.

#### **X. Appeals.**

- A. In conformance with the Act, appeals may be made to the City Fairness in Construction Board or Fairness in Professional Services and Goods Board on the following:



1. The grant or denial of a Request for Waiver;
  2. Substitution for an MBE/WBE listed on a Contractor Utilization Plan;
  3. Modification of the percentage of MBE/WBE participation on a Contractor Utilization Plan;
  4. Liquidated Damages;
  5. The amount of MBE/WBE credit the Contractor may receive for MBE/WBE participation identified in the contractor utilization plan.
- B. Any appeal must be filed in writing with the Director within fifteen (15) calendar days of notice of the determination. Mailing, faxing, personal delivery or posting at CREO KC of determinations shall constitute notice. The appeal shall state with specificity why the Bidder or Contractor believes the determination is incorrect
- C. Failure to file a timely appeal shall constitute a waiver of a Bidder's or Contractor's right to appeal such determination and such person shall be estopped to deny the validity of any determination which could have been timely appealed.

#### **XI. Access to Documents and Records.**

- A. By submitting a Bid, each Bidder agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Bidder as may be necessary to ascertain compliance with the requirements of this document and the Act, within ten (10) calendar days of the date of the written request.
- B. All Bidders agree to cooperate with the contracting department and CREO KC in studies and surveys regarding the MBE/WBE program.

#### **XII. Miscellaneous.**

- A. A Bidder or Contractor shall bear the burden of proof with regard to all issues on appeal.
- B. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.
- C. Oral representations are not binding on the City.
- D. The City Council may waive the requirements of this document and the Program and award the contract to the lowest and best bidder if the City Council determines a waiver is in the best interests of the City.
- E. The Director may grant extensions of time to Bidders to submit Letters of Intent to Subcontract (CREO KC Form 00450.01).

#### **XIII. Liquidated Damages – Economic Equity & Inclusion Goals--MBE/WBE Program.**

- A. If Contractor fails to achieve the MBE/WBE goals stated in its Contractor Utilization Plan, as amended, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. Therefore, in order to liquidate those damages, the monetary difference between either (1) the amount of the MBE/WBE goals set forth in the Contractor Utilization Plan, as amended, or (2) the goals established (whichever is lower) and the amount actually paid to qualified MBEs and WBEs for performing a commercially useful function will be deducted from the Contractor's payments as



liquidated damages. In determining the amount actually paid to qualified MBEs and WBEs, no credit will be given for the portion of participation that was not approved by the Director, unless the Director determines that the Contractor acted in good faith. No deduction for liquidated damages will be made when, for reasons beyond the control of the Contractor, the MBE/WBE participation stated in the Contractor Utilization Plan, as amended and approved by the Director is not met.

## **PART B. CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS**

**IMPORTANT:** This Part B is applicable to City construction contracts estimated by the City prior to solicitation as: (1) requiring more than 800 construction labor hours and (2) valued in excess of \$300,000.00. This program is distinguished from the M/WBE Program in that it is based on workforce hours of the Bidder and *all* its participating subcontractors rather than the actual contract value of work. The instructions herein detail the specifics related to this program. This program is in *addition* to the M/WBE program.

### **I. City's Construction Employment Program.**

- A. The City has adopted a Construction Employment Program (Sections 3-501 through 3-525, Code of Ordinances) (the "Workforce Program" or "Program") to implement the City's policy of supporting the fullest possible utilization of minority and women workers in the construction industry.
- B. The minimum workforce goals are currently set by ordinance at 10% for minorities and 2% for women. These goals are separate from M/WBE goals. Public recognition may be provided if the bidder achieves at least twice the minimum participation.
- C. Construction contracts subject to the Workforce Program and the company-wide and project-specific workforce goals ("workforce goals") are those contracts to construct, reconstruct, improve, enlarge or alter any fixed work that is estimated by the City prior to solicitation to: (1) require more than 800 construction labor hours, (2) has estimated costs that exceed \$300,000.00, and (3) involve the expenditure of public funds.
- D. The successful bidder may meet company-wide goals by counting the bidder's utilization of minorities and women throughout the Kansas City metropolitan statistical area. In addition, the successful Bidder is responsible to ensure that it and its subcontractors cumulatively make good faith efforts to meet project-specific goals for utilization of minorities and women.
- E. These Civil Rights & Equal Opportunity Department ("CREO KC") Forms & Instructions are part of the BIDDING DOCUMENTS and CONTRACT DOCUMENTS as defined in the General Conditions. By submitting a Bid, the Bidder agrees, as a material term of the contract, to carry out the City's Construction Employment Program by making good faith efforts to utilize minority and women workers to the fullest extent consistent with submitting the lowest and best bid to the City. Bidder agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Bidder in fact meet or exceed the construction employment goals to receive approval from CREO KC, a Bidder not doing so is required to



objectively demonstrate to CREO KC that good faith efforts have been made.

- F. The following reports are to be used for Construction Employment Program submittals:
1. Project Workforce Monthly Report
  2. Company-Wide Workforce Monthly Report

## II. Required Submissions.

- A. Within forty-eight (48) hours after bid opening, the construction contractor shall submit the **Construction Employee Identification Report** (CREO KC Form 00485.04) and shall include: the name, home address, job title, sex and race/ethnicity of each person working for the Prime. The individuals to be listed on the form are those which the construction contractor *anticipates* will be performing construction labor hours creditable towards the minimum workforce goals applicable to the construction contractor individually.

The following circumstances also require the submission of a Construction Employee Identification Report:

- a. Prior to contract execution for those City construction contracts awarded pursuant to a request for proposals (RFP), the construction contractor shall submit a **Construction Employee Identification Report** (CREO KC Form 00485.04).
  - b. At least ten (10) days prior to the date upon which any subcontractor is to commence work under a City construction contract, the Prime shall submit a **Construction Employee Identification Report** (CREO KC Form 00485.04) for the subcontractor.
- B. The CREO KC Director has established the B2GNow Diversity Management System (“B2GNOW”) (an online reporting tool) as the preferred method for fulfilling reporting requirements of the Workforce Program. The CREO KC Director will allow paper submission in lieu of on-line submission if the on-line submission process presents a hardship to the contractor.
- C. Bidder must submit the following documents through B2GNow on a monthly basis if awarded the contract:
1. **Project Workforce Monthly Report.** This report is contract specific. This report must be submitted to the Director by the 15<sup>th</sup> of each month for the Contractor and each subcontractor. It will be utilized to report the Contractor’s own workforce compliance data with regard to the City’s construction contract. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.
  2. **Company-Wide Workforce Monthly Report.** This report is not contract specific; it is used to report on the utilization of women and minorities, by trade, company-wide. This report must be submitted to the Director by the 15<sup>th</sup> of each month. It will be utilized to report the Contractor’s own workforce compliance data with regard to



every contract (both privately and publicly funded) that the Contractor has in progress throughout the Kansas City Metropolitan Statistical Area. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

### **III. Submittal Required for Final Contract Payment.**

- A. The final Project Workforce Monthly Report(s) and Company-Wide Workforce Monthly Report must be submitted before final payment will be made and/or retainage released. Contractor shall note the submittal of the final reports by notation in the box entitled “Final Report”

### **IV. Methods for Securing Workforce Participation and Good Faith Efforts.**

- A. A bidder is required to make good faith efforts to achieve the construction employment goals and ensure its subcontractors are making good faith efforts to achieve the construction employment goals. If a Bidder or its subcontractors will be unable to secure enough minority and female participation to meet or exceed the construction employment goals, a bidder must, within a reasonable time after so learning, request a waiver or modification of the goals by the Director of CREO KC. The Director will request evidence of the Bidder’s and its’ subcontractors’ good faith efforts to meet the goals. The Director will examine the Bidder’s request and the Bidder’s documentation of good faith efforts for itself and its subcontractors. The Director will examine the Bidder’s request and the Bidder’s documentation of good faith efforts and grant or deny a waiver or modification. The Director will grant a waiver or modification only if the Bidder has made good faith efforts to secure minority and female participation.

**IMPORTANT:** The Bidder’s subcontractors on a city construction contract must meet the workforce goals collectively. The bidder is responsible to ensure the subcontractors make good faith efforts to meet the workforce goals. Bidders are required to include language in its subcontracts that ensure the subcontractors make good faith efforts to meet or exceed the workforce goals.

- B. In evaluating good faith efforts, the Director will consider whether the Bidder and its subcontractors have performed the following:
  1. For those bidders that are not signatories to a collective bargaining agreement with organized labor:
    - a. Requested in writing the assistance of the Director with respect to efforts to promote the utilization of minorities and women in the workforce and acted upon the Director’s recommendations; and
    - b. Advertised in minority or women trade association newsletters and/or minority or women owned media at least 15 calendar days prior to the utilization of any construction services on the city construction contract and used terminology that sufficiently describes the work available, the pay scale, the application process, and anything else that one might reasonably be expected to be informed of relevant to the position being advertised; and
    - c. Maintained copies of each advertisement and a log identifying the publication and date of publication; and



- d. Conducted real and substantial recruitment efforts, both oral and written, targeting resident, minority and women community-based organization, schools with a significant minority student population, and training organizations serving the recruitment area; and
  - e. Established and maintained a current list of resident, minority and women recruitment sources, providing written notification to the recruitment sources of available employment opportunities, and maintained records of the notices submitted to the organizations and any responses thereto; and
  - f. Maintained a current file for the time period of the city construction contract with the name, address, and telephone number of each resident, minority and woman job applicant, the source of the referral, whether or not the person was hired, and in the event that the applicant was not hired, the reason therefore; and
  - g. Promoted the retention of minorities and women in its workforce with the goals of achieving sufficient annual hours for minorities and women to qualify for applicable benefits; and
  - h. Required by written contract that all subcontractors comply with the above efforts.
2. For those bidders that are signatories to collective bargaining agreements with organized labor:
- a. Requested in writing from each labor union representing crafts to be employed that:
    - i. the labor union make efforts to promote the utilization of residents of the City, minorities and women in the workforce; and
    - ii. the labor union identify any residents of the City, minorities and women in its membership eligible for employment; and
  - b. Collaborated with labor unions in promoting mentoring programs for journeypersons intended to assist minorities and women in increasing retention with the goals of achieving sufficient annual hours to qualify for applicable benefits; and
  - c. Maintained a current file with the name, address, and telephone number of each resident, minority and women worker identified by the labor union, whether or not the person was hired, and in the event the person was not hired, the reason therefore.
  - d. To the extent the good-faith efforts applicable to bidders that are signatories to collective bargaining agreements with organized labor conflict with the procedures implemented by the bidder in order to comply with the relevant bargaining agreement, the bidder shall substitute other procedures as may be approved by the Director in writing, in order to accomplish the purpose and intent of this section.

C. In the event workforce goals are not met or there is anticipation that goals will not be



met, a Bidder will be required to give the City documentation to prove that it and/or its subcontractors made good faith efforts. The Bidder will be contacted by the City with further instructions about when this documentation must be submitted.

#### **V. Access to Documents and Records.**

- A. By submitting a Bid, each Bidder agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Bidder as may be necessary to ascertain compliance with the requirements of this document and the Program, within ten (10) days of the date of the written request. Each bidder further agrees to require, if awarded the contract, that every subcontractor permit the City the same access to documents and records.
- B. All Bidders agree to cooperate with the contracting department and CREO KC in studies and surveys regarding the construction employment program.

#### **VI. Appeals.**

- A. In conformance with the Program, appeals may be made to the Construction Workforce Board on the following:
  - 1. Determinations by the Director that a contractor did not meet the construction employment goals and did not make a good faith effort to meet the goals;
  - 2. Recommendations by the Director to assess liquidated damages;
  - 3. Recommendation by the Director that a contractor be declared ineligible to receive any city construction contract for a period of time up to one year.
- B. Any appeal must be filed in writing with the Director within ten (10) working days of notice of the recommendation or determination. The appeal shall state with specificity why the Bidder or Contractor believes the recommendation or determination is incorrect.
- C. Failure to file a timely appeal shall constitute a waiver of a Bidder's or Contractor's right to appeal such determination or recommendation and such person shall be estopped to deny the validity of any order, determination, recommendation or action of CREO KC which could have been timely appealed.

#### **VII. Miscellaneous.**

- A. A Bidder or Contractor shall bear the burden of proof with regard to all issues on appeal.
- B. The successful bidder may be required to meet with the Director of CREO KC or the Director's designee for the purpose of discussing the construction employment program, the bidder's efforts to realize the goals, and any other problems and/or issues affecting the realization of the goals or the program in general.
- C. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.
- D. Oral representations are not binding on the City.

#### **VIII. Failure to Meet Workforce Goals**

- A. If Contractor or its subcontractors fail to achieve the construction employment goals or make good faith efforts to achieve those goals without having previously obtained a



waiver or modification of those goals, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. These damages are magnified if the failure to abide by the requirements of the Workforce Program is recurring. Therefore, if the directory finds that the contractor or subcontractor have not met, or made good faith efforts to meet, the construction employment goals for any quarter, the director may:

1. Assess liquidated damages against the construction contractor, as specified in the city construction contract;
2. Require the contractor to attend mandatory training, as specified in the construction contract;
3. Declare the contractor ineligible to receive any city construction contract or participate as a subcontractor under any city construction contract for a period of time up to six months, as specified in the construction contract.

#### **IX. First Source Program**

- A. The City has established a labor force recruiting program intended to assist contractors in identifying, interviewing and hiring qualified job applicants residing in Kansas City, Missouri. While the contractor awarded a City construction contract is not prohibited from hiring persons residing outside Kansas City, Missouri, the recruiting resource provided for herein (the “First Source Program”) must be utilized by the contractor subject to the construction employment goals as set forth in this **PART B, CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS**.
- B. The City utilizes the services of the Full Employment Council, Inc., to administer the First Source Program. The contractor shall contact the Full Employment Council within 48 hours of contract award, regardless of whether the contractor has any hiring needs at that time, and within 48 hours following any job vacancy which the contractor reasonably anticipates filling during the term of the City construction contract. The contractor shall comply with the First Source Program requirements as implemented by the Full Employment Council unless otherwise excused in writing by the Director of CREO KC for good cause shown. To ensure compliance with the First Source Program, the contractor shall contact those persons at the Full Employment Council responsible for administering the program, which may be identified by visiting their website at [www.feckc.org](http://www.feckc.org) and clicking on the link for KCMO First Source Hiring Program. The contractor shall not hire any individual to provide construction services on a City construction contract unless the contractor has met the requirements of the First Source Program.
- C. The contractor shall require that its subcontractors utilize the First Source Program to the same extent that the contractor is required to do so, and shall incorporate the requirements of this Section IX into every subcontract. Every subcontractor shall be required to contact the Full Employment Council within 48 hours of subcontract award, regardless of whether the subcontractor has any hiring needs at that time, and within 48 hours following any job vacancy which the subcontractor reasonably anticipates filling during the term of their subcontract on a City construction project.





# CONTRACTOR UTILIZATION PLAN/REQUEST FOR WAIVER

Project Number \_\_\_\_\_

Project Title \_\_\_\_\_

\_\_\_\_\_  
(Department Project)

\_\_\_\_\_  
Department

\_\_\_\_\_  
(Bidder/Proposer)

STATE OF \_\_\_\_\_ )

) ss

COUNTY OF \_\_\_\_\_ )

I, \_\_\_\_\_, of lawful age and upon my oath state as follows:

1. This Affidavit is made for the purpose of complying with the provisions of the MBE/WBE submittal requirements on the above project and the MBE/WBE Program and is given on behalf of the Bidder/Proposer listed below. It sets out the Bidder/Proposer's plan to utilize MBE and/or WBE contractors on the project.
2. The project target goals are \_\_\_\_\_% MBE and \_\_\_\_\_% WBE.
3. Bidder/Proposer assures that it will utilize a minimum of the following percentages of MBE/WBE participation in the above project:

| **BIDDER/PROPOSER PARTICIPATION:** \_\_\_\_\_% MBE \_\_\_\_\_% WBE

| **POST-BID/POST-RFP ESTIMATED BUDGET:** \$ \_\_\_\_\_

4. The following are the M/WBE subcontractors whose utilization Bidder/Proposer warrants will meet or exceed the above-listed Bidder/Proposer Participation. Bidder/Proposer warrants that it will utilize the M/WBE subcontractors to provide the goods/services described in the applicable Letter(s) of Intent to Subcontract, copies of which shall collectively be deemed incorporated herein. (*All firms must currently be certified by Kansas City, Missouri*)

| Name of M/WBE Firm \_\_\_\_\_

Address \_\_\_\_\_

Telephone No. \_\_\_\_\_

I.R.S. No. \_\_\_\_\_



Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

*(List additional M/WBEs, if any, on additional page and attach to this form)*

4. The following is a breakdown of the percentage of the total contract amount that Bidder/Proposer agrees to pay to each listed M/WBE:

**MBE/WBE BREAKDOWN SHEET**

**MBE FIRMS:**

Name of MBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____



\_\_\_\_\_

**TOTAL MBE \$ / TOTAL MBE %:** \$ \_\_\_\_\_ %

**WBE FIRMS:**

Name of WBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
<b>TOTAL WBE \$ / TOTAL WBE %:</b>		\$ _____	_____ %	

\*“Subcontract Amount” refers to the dollar amount that Bidder/Proposer has agreed to pay each M/WBE subcontractor as of the date of contracting and is indicated here solely for the purpose of calculating the percentage that this sum represents in proportion to the total contract amount. Any contract amendments and/or change orders changing the total contract amount may alter the amount due an M/WBE under their subcontract for purposes of meeting or exceeding the Bidder/Proposer participation.

\*\*“Weighted Value” means the portion of the subcontract amount that will be credited towards meeting the Bidder/Proposer participation. See CREO KC Forms and Instructions for allowable credit and special instructions for suppliers.

- Bidder/Proposer acknowledges that the monetary amount to be paid each listed M/WBE for their work, and which is approved herein, is an amount corresponding to the percentage of the total contract amount allocable to each listed M/WBE as calculated in the MBE/WBE Breakdown Sheet. Bidder/Proposer further acknowledges that this amount may be higher than the subcontract amount listed therein as change orders and/or amendments changing the total contract amount may correspondingly increase the amount of compensation due an M/WBE for purposes of meeting or exceeding the Bidder/Proposer participation

6. Bidder/Proposer acknowledges that it is responsible for considering the effect that any change orders and/or amendments changing the total contract amount may have on its ability to meet or exceed the Bidder/Proposer participation. Bidder/Proposer further acknowledges that it is responsible for submitting a Request for Modification or Substitution if it will be unable to meet or exceed the Bidder/Proposer participation set forth herein.
7. If Bidder/Proposer has not achieved both the M/WBE goal(s) set for this Project, Bidder/Proposer hereby requests a waiver of the MBE and/or WBE goal(s) that Bidder/Proposer has failed to achieve
8. Bidder/Proposer will present documentation of its good faith efforts, a narrative summary detailing its efforts and the reasons its efforts were unsuccessful when requested by the City.
9. I hereby certify that I am authorized to make this Affidavit on behalf of the Bidder/Proposer named below and who shall abide by the terms set forth herein:

Bidder/Proposer primary contact: \_\_\_\_\_

Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Facsimile number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

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

(Attach corporate seal if applicable)

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_  
Notary Public





# LETTER OF INTENT TO SUBCONTRACT

Check one:	
Original LOI:	<input type="checkbox"/>
Updated LOI:	<input type="checkbox"/>

Project Name/Title \_\_\_\_\_  
 Project Location/Number \_\_\_\_\_

**PART I:** Prime Contractor \_\_\_\_\_ agrees to enter into a contractual agreement with M/W/DBE Subcontractor \_\_\_\_\_ who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

for an estimated amount of \$ \_\_\_\_\_ (or \_\_\_\_\_ % of the total estimated contract value.)

- M/WBE Vendor type:
- Subcontractor/manufacturer (counts as 100% of contract value towards goals)
  - Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)
  - Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

**PART 2:** This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

- Select one:
- The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)
  - The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: \_\_\_\_\_

Full address: \_\_\_\_\_  
Street number and name City, State and Zip Code

Primary contact: \_\_\_\_\_  
Name Phone

a) This subcontractor is (select one):    MBE    WBE    DBE    N/A

- i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.
- ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: \_\_\_\_\_

c) The dollar value of this agreement is: \_\_\_\_\_





# **TIMETABLE FOR MBE/WBE UTILIZATION**

*(This form should be submitted to the City after contract award.)*

I, \_\_\_\_\_, acting in my capacity as \_\_\_\_\_  
(Name) (Position with Firm)  
of \_\_\_\_\_, with the submittal of this Timetable, certify that  
(Name of Firm)  
the following timetable for MBE/WBE utilization in the fulfillment of this contract is correct and true to the best of my knowledge.

## **ALLOTTED TIME FOR THE COMPLETION OF THIS CONTRACT**

*(Check one only)*

15 days	___	75 days	___	135 days	___
30 days	___	90 days	___	150 days	___
45 days	___	105 days	___	165 days	___
60 days	___	120 days	___	180 days	___
Other	_____ (Specify)				

Throughout \_\_\_\_\_ Beginning 1/3 \_\_\_\_\_  
Middle 1/3 \_\_\_\_\_ Final 1/3 \_\_\_\_\_  
Beginning 1/3 \_\_\_\_\_% Middle 1/3 \_\_\_\_\_% Final 1/3 \_\_\_\_\_%

**PLEASE NOTE:** Any changes in this timetable require approval of the Civil Rights & Equal Opportunity Department in advance of the change.

If you have any questions regarding the completion of this form, please contact the Civil Rights & Equal Opportunity Department at: (816) 513-1836.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Position with Firm)

\_\_\_\_\_  
(Date)





# REQUEST FOR MODIFICATION OR SUBSTITUTION

(This Form **must** be submitted to CREO KC to request substitutions for an MBE/WBE listed in the Contractor Utilization Plan or for modification of the amount of MBE/WBE participation listed in the Contractor Utilization Plan. This Form shall be an amendment to the Contractor Utilization Plan.)

**BIDDER/PROPOSER/CONTRACTOR:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**PROJECT NUMBER OR TITLE:** \_\_\_\_\_

**AMENDMENT/CHANGE ORDER NO: (if applicable)** \_\_\_\_\_

<b>Project Goals:</b>	_____ % MBE	_____ % WBE
<b>Contractor Utilization Plan:</b>	_____ % MBE	_____ % WBE

1. I am the duly authorized representative of the above Bidder/Contractor/Proposer and am authorized to request this substitution or modification on behalf of the Bidder/Contractor/Proposer.

2. I hereby request that the Director of CREO KC recommend or approve: (check appropriate space(s))

a. \_\_\_\_\_ A substitution of the certified MBE/WBE firm \_\_\_\_\_,  
*(Name of new firm)*  
 to perform \_\_\_\_\_,  
*(Scope of work to be performed by new firm)*

for the MBE/WBE firm \_\_\_\_\_ which is currently  
*(Name of old firm)*  
 listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan to  
 perform the following scope of work: \_\_\_\_\_.  
*(Scope of work of old firm)*

b. \_\_\_\_\_ A modification of the amount of MBE/WBE participation currently listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan from  
 \_\_\_\_\_ % MBE \_\_\_\_\_ % WBE *(Fill in % of MBE/WBE Participation currently listed on Contractor Utilization Plan)*

**TO**

\_\_\_\_\_ % MBE \_\_\_\_\_ % WBE *(Fill in New % of MBE/WBE Participation requested for Contractor Utilization Plan)*

- c. Attach 00450.01 Letter of Intent to Subcontract letter for each new MBE/WBE to be added.
- d. Attach a copy of the most recent 00485.01 or on-line M/WBE Monthly Utilization Report

3. Bidder/Contractor/Proposer states that a substitution or modification is necessary because: (check applicable reason(s) )



\_\_\_The MBE/WBE listed on the Contractor Utilization Plan is non-responsive or cannot perform.

\_\_\_The MBE/WBE listed on the Contractor Utilization Plan has increased its previously quoted price without a corresponding change in the scope of work.

\_\_\_The MBE/WBE listed on the Contractor Utilization Plan has committed a material default or breach of its contract.

\_\_\_Requirements of the scope of work of the contract have changed and make subcontracting not feasible or not feasible at the levels required by the goals established for the contract.

\_\_\_The MBE/WBE listed on the Contractor Utilization Plan is unacceptable to the City contracting department.

\_\_\_Bidder/Contractor/Proposer has not attempted intentionally to evade the requirements of the Act and it is in the best interests of the City to allow a modification or substitution.

4. The following is a narrative summary of the Bidder's/Contractor's/Proposer's good faith efforts exhausted in attempts to substitute the MBE/WBE firm named above which is currently listed on the Contractor Utilization Plan with other qualified, certified MBE/WBE firms for the listed scope of work or any other scope of work in the project:

5. Bidder/Proposer/Contractor will present documentation when requested by the City to evidence its good faith efforts.

Dated: \_\_\_\_\_

\_\_\_\_\_  
(Bidder/Proposer/Contractor)

By: \_\_\_\_\_  
(Authorized Representative)





This form is to be completed and given to your contractor.

<b>Exempt Entity and Project Information</b>	Name of Exempt Entity Issuing the Certificate		Missouri Tax Exemption Number			
	Address		City		State	ZIP Code
	E-mail Address					
	Project Number	Project Begin Date (MM/DD/YYYY) ____/____/____		Estimated Project End Date (MM/DD/YYYY) ____/____/____		
	Description of Project					
	Project Location			Certificate Expiration Date (MM/DD/YYYY) ____/____/____		
	Provide a signed copy of this certificate, along with a copy of the exempt entity's Missouri Sales and Use Tax Exemption Letter to each contractor or subcontractor who will be purchasing tangible personal property for use in this project. It is the responsibility of the exempt entity to ensure the validity of the information on the certificate. The exempt entity must issue a new certificate if any of the information changes.					
Signature of Authorized Exempt Entity		Printed Name of Authorized Exempt Entity		Date (MM/DD/YYYY) ____/____/____		

<b>Contractor</b>	The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to <a href="#">Section 144.062, RSMo</a> . Under penalties of perjury, I declare that the above information and any attached supplement is true, complete, and correct.					
	Name of Purchasing Contractor		Signature of Contractor		Date (MM/DD/YYYY) ____/____/____	
	Address		City		State	ZIP Code

<b>Subcontractor</b>	Contractors - Present this to your supplier in order to purchase the necessary materials tax exempt. Complete the Subcontractor portion if extending the certificate to your subcontractor. The contractor must sign the form in the space provided below.					
	Name of Purchasing Subcontractor					
	Address		City		State	ZIP Code
	Signature of Contractor		Contractor's Printed Name		Date (MM/DD/YYYY) ____/____/____	

Form 5060 (Revised 11-2019)

Taxation Division  
P.O Box 358  
Jefferson City, MO 65105-0358

Phone: (573) 751-2836  
Fax: (573) 522-1666  
E-mail: [salestaxexemptions@dor.mo.gov](mailto:salestaxexemptions@dor.mo.gov)

Visit <http://dor.mo.gov/business/sales/sales-use-exemptions.php> for additional information.





## ADDENDUM NUMBER 3

Project Number 8000977/9618

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Project Title Prospect Elevated Water Storage Tank

ISSUE DATE: March 9, 2023

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on **March 14, 2023**, are amended as follows:

The Bid date for this Project stated in Document 00130 - Invitation to Bid shall be changed to: **2:00 PM, on March 21, 2023.**

### Information to Bidders

Due to the desire to limit the number of individuals in the KC Water Administration Building, we would like to communicate the option to attend the Public Bid Opening virtually for **March 21, 2023**.

1. We will allow Bidders to submit their bids at KC Water Administration Building, North entrance by the 2:00 PM deadline mentioned in the Invitation for Bid.
2. We are offering a virtual meeting via the link and information for Microsoft Teams. The Bid Reading will be “Live” through any computer, tablet or mobile device using the provided link. You can also choose to call-in using the number provided as well.

### Microsoft Teams meeting

**Join on your computer, mobile app or room device**

[Click here to join the meeting](#)

Meeting ID: 266 460 469 413

Passcode: HjxN9g

[Download Teams](#) | [Join on the web](#)

**Or call in (audio only)**

[+1 872-212-5076,,903853655#](#) United States, Chicago

Phone Conference ID: 903 853 655#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

3. The Bid Results will be posted to the KCMO Planroom like our normal process.

### Bidding Requirements

1. Add the following Documents:
  - a. 00485.04 HRD Construction Contractor Employee Identification Report form

## Specifications

1. Delete and replace Section 33 12 16, 2.02, Item A. with the following:
  - A. Acceptable Manufacturers
    1. DeZurik, a unit of General Signal Corporation.
    2. Henry Pratt Company.
    3. Val-Matic Valve & Mfg. Corporation.
    4. No equal or substitute.
2. Delete and replace Section 33 12 16, 2.03, Item N.3 with the following:
  3. Valve shall come equipped with solenoid valve actuator suitable for opening and closing the valve.
3. Delete and replace Section 33 12 16, 2.04, Item A. with the following:
  - B. Acceptable Manufacturers
    1. APCO, Valve and Primer Corporation.
    2. GA Industries, Inc.
    3. CCNE, Inc.
    4. Val-Matic Valve & Mfg. Corporation.
4. Section 33 12 16, 2.04, Item F - Table 3 - Check Valve Schedule, delete the Valve Type and replace with *Cushioned Swing Check*.
5. Delete Section 33 16 11, 2.09, item H.2 and replace with the following:
  2. Provide one minimum 30 in. square weatherproof access tube hatch. The opening shall have a minimum 4 in. curb. Provide aluminum covers with a 2 in. down turned edge, stainless steel hardware, hold open arm, and a locking mechanism.
6. Delete Section 33 16 11, 3.02, item B.1 and replace with the following:
  1. Provide a smooth form finish without rub for the interior and exterior support wall. Tie holes shall be plugged using grout on the interior and manufactured plugs on the exterior which match the color of the cured concrete as closely as possible.

## Drawings

1. Drawing A004 – Elevated Storage Tank Elevations and Logo – Tank colors and logo is hereby modified as follows:
  - a. Tank exterior color shall be *Tnemec Color: Tnemec White*
  - b. Tank exterior logo shall be comprised of the following Pantone colors:
    - i. Red – Warm Red
    - ii. Black – Black
    - iii. Blue – 2139 u
  - c. Tank exterior logo files will be provided to the successful bidder. Tank logo shall be the following logo:



Questions from Bidders The following is provided to respond to Bidders questions:

Q1	The notes on this sheet indicate the gas line is to be relocated by Spire Energy. Please confirm any costs from Spire Energy for this work will be direct billed to the Owner.
A1	<b>This questions will be answered as part of a future addenda to be issued next week.</b>
Q2	Please confirm an Engineer's field office is required at the project site as this is not common for elevated water tower construction. We typically do not have a separate job site office on elevated water towers as our Tool Van has an office for our field superintendent. Please confirm a separate field office is required for this project for the Engineer and Owners use.
A2	<b>A Field Office for Resident Project Representatives shall be provided as specified. Bidders shall comply with all requirements, including those in Specification Sections 01015 and 01520.</b>
Q3	The specifications state that a qualified supervisor directly employed by the manufacturer shall be on site at all times during construction of the foundation, support structure, and steel tank. We do have our own foundation crews, however, we will most likely subcontract the foundation installation in this area of the Country and do not typically have a full time direct employee on site to supervise our subcontractors work as we utilize trusted subcontractors that we have worked with several times and have their superintendent act of behalf of the Contractor when they are on-site. This requirement will add significant cost to the project to have a full-time non-productive supervisor for the installation of the foundation. Please consider removing this requirement for the foundation installation.
A3	<b>The Contractor's superintendent shall be present and productive throughout the project. As specified, the Contractor's competent resident superintendent shall be assigned at all times during the progress of the Work, including during the foundation construction period.</b>
Q4	The specifications call for a light sandblast to the exposed exterior concrete support wall surface. We suggest eliminating this requirement as OSHA came out with a Silica Exposure Standard that went into effect in the fall of 2017 for the construction industry. Brush blasting of exposed concrete will require mandatory containment and air monitoring of the surrounding area to be compliant with this new regulation and will add significant cost to the project. We have also found that a cast concrete shaft has a better appearance that one that is sandblasted as sandblasting exposes the concrete aggregate. Please consider eliminating this requirement.

<b>A4</b>	<b>Sandblasting of the concrete support wall surface is deleted with this Addendum.</b>
Q5	Section 33 16 11, 2.09, item H 2, calls for manufactured access tube extension. Can you provide a specification for this component? This particular requirement is not typical and there are a lot of variables that can come into play. We typically see the access tube stopping at the roof level and then a roof manway provides access to the tank roof.
<b>A5</b>	<b>This item is being revised with this Addendum.</b>
Q6	In order to utilize the most efficient and effective business practices in the short duration of the bidding process, we would like to propose the use of DocuSign to submit documents using a digital signature platform in place of physical paper and wet-ink pen signatures. With this system, all employees are required to log onto DocuSign using an individual username / email address, personal password, and a multi-factor authentication code to ensure user is authenticated. A Certificate of Completion document is generated by DocuSign and provides an audit trail for signatures. This service streamlines the process of gathering signatures allowing signatories to quickly review documents and electronically sign or initial where required. Is this acceptable?
<b>A6</b>	<b>No. DocuSign will not be acceptable for the bidding process.</b>
Q7	In an effort to further streamline the process of executing bid documents in the post-bid environment, can the requirement for documents to be notarized be eliminated? If electronic signatures are allowed (i.e. via DocuSign), notarization of documents would not be necessary since digital signatures can be authenticated.
<b>A7</b>	<b>No. DocuSign will not be acceptable for the bidding process and documents must be notarized as indicated.</b>
Q8	Can you confirm that the Owner has obtained the necessary approvals and permits required to start construction?
<b>A8</b>	<b>The Owner and the Contractor are responsible for different permits. Refer to 00700 General Conditions, Paragraph 6.09 Permits.</b>
Q9	Can you confirm funding is in place for this project?
<b>A9</b>	<b>Yes, this project is funded.</b>
Q10	00130 Invitation to Bid states the Kansas City, Missouri will receive sealed Bids at 4800 E. 63rd St. Trfwy, Kansas City, MO 64130. However, 00210 Instructions to Bidders (Page 1 of 7) No. 1, states sealed bids will be received at 4600 E. 63rd St., Trfwy, Kansas City, MO 64130. Please clarify the address where bids will be received.
<b>A10</b>	<b>This question was previously asked and answered in Addendum #2, in the updated Invitation to Bid.</b>
Q11	00210 Instructions to Bidders, No. 6. Interpretation and Addenda (page 3 of 7) states questions received less than (10) days prior to the date for opening of bids may not be answered. However, 00210 Instructions to Bidders, No. 27. (page 7 of 7) states Questions received less than Five (5) days prior to the bid date may not be answered. Please clarify.
<b>A11</b>	<b>Due to the conflict, questions will be accepted up to five days prior to the bid date.</b>
Q12	Please confirm work on Saturday will not be restricted.
<b>A12</b>	<b>Refer to 00700, Paragraph 6.03 - Services, Working Hours, Labor, Materials and</b>

	<b>Equipment - The Contractor may submit a request to the City to work on Saturdays. However, the City may or may not grant the Contractor permission to work on Saturdays.</b>
Q13	Please confirm work on Sunday will not be restricted.
A13	<b>Refer to 00700, Paragraph 6.03 - Services, Working Hours, Labor, Materials and Equipment - The Contractor may submit a request to the City to work on Sundays. However, the City may or may not grant the Contractor permission to work on Sundays.</b>
Q14	Is this project subject to any Buy American, American Iron and Steel or other domestic material procurement requirements? If yes, can the specific requirements and or references be provided?
A14	<b>This question was previously asked and answered in Addendum #2.</b>
Q15	00210 Instructions to Bidders, 1. B. states bids shall be deposited in the locked Bid Box. Please advise size limit/dimensions for packages to be placed/inserted into this Locked Bid Box so we can assure our bid package will fit.
A15	<b>The size of the bid box should accept all bidder's submittals. If the documents will not fit in the Bid Box, Bidder's sealed bids may be manually date stamped and accepted by City staff at the north security desk or the mail room on the east side of the building.</b>
Q16	Please confirm we follow Section 331611, AWWA D107 and industry standards for the composite tank relating to mixes, curing, form removal times, etc. in lieu of Section 033000 as Division 3 relates more to concrete operations such as concrete paving and sidewalks, etc.
A16	<b>Refer to Addendum #2, Answer to Question 10.</b>
Q17	The drawing shows a 45 ft tall tank side wall height – while we will be close to this dimension we will surely vary. Please confirm this dimension is for logo proportioning only and can vary.
A17	<b>This question was previously asked and answered in Addendum #2.</b>
Q18	Section 331611, Paragraph 2.09.M.1.c - This paragraph describes an expansion joint which “matches the material used in the discharge and inlet risers.” The pipe material is ductile iron below the expansion joint and stainless steel above the expansion joint. Please confirm the expansion joint material, we suggest the industry standard - which is carbon steel.
A18	<b>As indicated in that paragraph - “and shall be determined by the Tank Manufacturer.”</b>
Q19	Are the bolt sets for the flanged mechanical components located within the valve room standard carbon steel per ASTM A307 Grade B or 304 stainless steel?
A19	<b>ASTM A307, Grade B - refer to 331100, Paragraph 2.06.D.</b>
Q20	Can you confirm that the Owner currently owns the property (or properties) where work is to be performed? If not, can you provide information on the timing in which ownership will be obtained?

<b>A20</b>	<b>Yes, the tank property is owned by the City. The access roadway is jointly owned by the Cities of Kansas City, Missouri and Grandview, Missouri</b>
Q21	Can you confirm that the Owner currently owns and/or otherwise possess all required easements or permissions to work on or access the property (or properties) where the work is to be performed? If not, can you provide information on the timing in which these easement or permissions will be obtained?
<b>A21</b>	<b>The City has already obtained or will obtain the required easements in advance of the construction notice to proceed, anticipated to be June 2023.</b>
Q22	To be able to access and turn around fully loaded semi-trucks, can the temporary easement be extended 70' to the east carrying the same north and south boundaries? This area will also be utilized as a laydown area and would not impede traffic to the existing booster pump station and ground storage tank. If the answer is "No" to the question above, what other accommodations or access is allowed in the vicinity of the site to allow turning around of semi-trucks required for delivery?
<b>A22</b>	<b>No. Contractors will have access to the entire site owned by the City (see property lines on Drawing C002) for laydown area (provided access to the booster pump station is maintained and coordinated with the City) and Contractors may need to make their own accommodations for truck access or turnarounds.</b>
Q23	Please provide the voltage and amperage for the power lines running along the east boundary of the property.
<b>A23</b>	<b>Contractors will need to coordinate with Evergy who owns the power lines to the west of the tank location. No powerlines run along the east boundary of the property.</b>
Q24	Drawing C003 - The notes on this sheet indicate the gas line is to be relocated by Spire Energy. Please confirm this work will happen by Spire Energy prior to the Tank Contractor mobilizing to site.
<b>A24</b>	<b>The Contractor shall coordinate with Spire Energy to relocate this gas line.</b>
Q25	Has the Prospect Road Elevated Water Storage Tank Transmission Main Project been awarded? If it has been awarded, please provide the contractor information for the Prospect Road Elevated Water Storage Tank Transmission Main Project.
<b>A25</b>	<b>No. This project has not yet advertised for bid so the Contractor for that project is unknown at this time. The transmission main's bid advertisement is anticipated to occur in 2023 but may occur later.</b>
Q26	Please provide the depth and size of the sanitary sewer line running under the work area.
<b>A26</b>	<b>This question was previously asked and answered in Addendum #2.</b>
Q27	While the access road up to the site is sufficient at this time for construction traffic, it will surely degrade throughout the project. As we are unaware of the structural makeup of the existing drive it will be difficult to determine the amount or cost of damage, if any. Your best bet is to reduce Contractor risk in this area. May we suggest a common cash allowance be carried by all the bidders, this will protect the Owner and allow the Bidder to provide their best price.
<b>A27</b>	<b>Per 01560, Paragraph 3.04 Traffic Control and Use of Roadways, the Contractor</b>

	<b>shall be responsible maintaining roadways, walkways, and other traffic areas damaged by operations and restoring to pre-construction conditions, or better. To capture and document changes in condition, Contractor shall comply with the requirements of Section 01322 Photographic Documentation to capture pre-construction, construction, and post-construction conditions.</b>
Q28	Section 00410, Paragraph 10 requests the construction contractor to submit the HRD Employees Identification Report Form-Rev 102715 within 48 hours after bid opening. This form identifies the anticipated persons and hours credible towards the minimum employment goals. Our understanding is this form is to be used to connect the names of the persons on site with the names submitted during the course of construction within the Contractors Workforce Monthly Report (HRD Form 00485.02). The names of employees allocated to this project are not available at bid time – or within 48 hrs of bid time. Also, the names of persons allocated to this project will change during various phases of construction, some phases which are at least 1 year out. We request the HRD Employee Identification Report Form be a submittal(s) that happens during contract execution.
A28	<b>Updated CREO KC instructions were included in Section 00440 in Addendum #2. Form 00485.04 attached to this addendum is required to be submitted within 48 hours of bid opening and Contractors should identify <i>anticipated</i> employees and information on this form.</b>
Q29	CREO KC Instructions for Part B - Construction Contracts, Item II (pg 9 of 13), Paragraph A requests – within 48 hrs after bid opening – the construction contractor to submit the Construction Employee Identification Report (CREO KC Form 00485.04). Please confirm this Form replaces Form-Rev 102715 and as such is also a submittal(s) that happens during contract execution.
A29	<b>Correct. CREO KC Form 00485.04 is attached to this addendum.</b>
Q30	09 90 00, Paragraph 3.03 - Can you confirm that the Owner / Engineer will provide the coatings inspector?
A30	<b>The Contractor shall comply with and provide their own inspection per the requirements in this paragraph. Supplemental inspection services will be provided by the City as indicated in Addendum #2.</b>
Q31	09 90 00, Paragraph 3.03 - Can you confirm that the Owner / Engineer will cover all cost related to the NACE II or higher certified inspector?
A31	<b>The Contractor shall comply with and provide their own inspection per the requirements in this paragraph. Supplemental inspection services will be provided by the City as indicated in Addendum #2.</b>
Q32	09 90 00, Burns & McDonnell System E1 - Can you provide details to where this coating system is required?
A32	<b>Refer to 099000, Paragraph 2.04.D., generally within the valve room.</b>
Q33	Is a Bid Bond required for the Prospect - Elevated Water Storage Tank bid?
A33	<b>Please refer to 00210 Instructions to Bidders for bid bond requirement.</b>

**NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the Bid Form - Document 00410.**



## CERTIFICATION PAGE

Project/Contract Numbers: 80001977

Project Title: Prospect Elevated Water Storage Tank

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I am responsible for the following specifications and drawings:

Drawings: Sheets 1 through 8 and 21 through 28

Specifications:

**Division 1 - General Requirements**

01015 Project Requirements  
01320 Construction Progress Documentation  
01322 Photographic Documentation  
01340 Submittals  
01400 Quality Requirements  
01520 Temporary Facilities  
01560 Environmental Protection and Special Controls  
01570 Temporary Erosion and Sediment Control  
01580 Project Signs  
01600 Product Delivery, Storage, and Handling  
01640 Product Substitutions  
01770 Closeout Procedures  
01785 Warranties

**Division 31 - Earthwork**

312050 Site Preparation and Earthwork

**Division 32 - Exterior Improvements**

329200 Seeding

**Division 33 - Utilities**

330110.59 Cleaning, Disinfection and Leakage Testing  
331100 Pressure Pipe  
331216 Utility Valves and Accessories  
331611 Composite Elevated Water Storage Tanks  
331696 Reservoir Hydrodynamic Mixing System  
333150 Pipe Installation



Mar 24 2021 5:13 PM

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Frederic C. Brown

(SEAL)

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I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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I am responsible for the following specifications and drawings:

Drawings: Sheets 9 through 14

Specifications:

**Division 07 – Thermal & Moisture Protection**

072736 Spray Foam Insulation

079200 Joint Sealants

**Division 08 - Doors and Windows**

081613 Fiberglass Doors and Frames

083323 Overhead Coiling Doors

087000 Finish Hardware

**Division 09 – Finishes**

092116 Gypsum Board Assemblies

096515 Resilient Wall Base

099000 Protective Coatings

099647 Spray Foam Fireproofing



This document has been digitally signed.  
Mar 24 2021 4:58 PM

Ryan Lang (SEAL)

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I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I am responsible for the following specifications and drawings:

Drawings: Sheets 15 through 18

Specifications:

**Division 03 - Concrete**

031000 Concrete Formwork  
032000 Concrete Reinforcement  
033000 Concrete



This Document has been signed and sealed electronically.  
Mar 24 2021 11:52 AM

Adam Holmes (SEAL)

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I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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I am responsible for the following specifications and drawings:

Drawings: Sheets 19 through 20

Specifications:

**Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)**

- 230513 Common Motor Requirements for HVAC Equipment
- 230553 Identification for HVAC Piping and Equipment
- 238239 Unit Heaters



Reason: This document has been digitally signed and sealed.  
Date & Time: Mar 24 2021 12:28 PM

Jerry Kevan Prinds, Jr.

\_\_\_\_\_(SEAL)

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I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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I am responsible for the following specifications and drawings:

Drawings: Sheets 29 through 36

Specifications:

**Division 26 – Electrical**

- 260510 General Electrical Requirements
- 260519 Low Voltage Electrical Power Conductors and Cable
- 260526 Grounding and Bonding for Electrical Systems
- 260533 Raceways, Boxes, Seals, and Fittings for Electrical Systems
- 260553 Electrical Identification
- 262213 Low Voltage Distribution Transformers
- 262416 Panelboards
- 262726 Wiring Devices
- 265000 Lighting Devices

**Division 40 – Process Integration**

- 406000 Process Controls and Instrumentation - General Requirements
- 406196 Process Control Software Programming and Reports
- 406700 Process Control Panels and Hardware
- 407000 Instrumentation for Process Systems



Mar 24 2021 15:35

Casey A Behrends (SEAL)

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I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



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Project Title: Prospect Elevated Water Storage Tank

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00015	List of Drawings

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087000	Finish Hardware

**DIVISION 9 - FINISHES**

092116 Gypsum Board Assemblies  
096515 Resilient Wall Base  
099000 Protective Coatings  
099647 Spray Foam Fireproofing

**DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)**

230513 Common Motor Requirements for HVAC Equipment  
230553 Identification for HVAC Piping and Equipment  
238239 Unit Heaters

**DIVISION 26 - ELECTRICAL**

260510 General Electrical Requirements  
260519 Low Voltage Electrical Power Conductors and Cable  
260526 Grounding and Bonding for Electrical Systems  
260533 Raceways, Boxes, Seals, and Fittings for Electrical Systems  
260553 Electrical Identification  
262213 Low Voltage Distribution Transformers  
262416 Panelboards  
262726 Wiring Devices  
265000 Lighting Devices

**DIVISION 31 - EARTHWORK**

312050 Site Preparation and Earthwork

**DIVISION 32 - EXTERIOR IMPROVMENTS**

329200 Seeding

**DIVISION 33 - UTILITIES**

330110.59 Cleaning, Disinfection and Leakage Testing  
331100 Pressure Pipe  
331216 Utility Valves and Accessories  
331611 Composite Elevated Water Storage Tanks  
331696 Reservoir Hydrodynamic Mixing System  
333150 Pipe Installation

**DIVISION 40 – PROCESS INTEGRATION**

406000 Process Controls and Instrumentation - General Requirements  
406196 Process Control Software Programming and Reports  
406700 Process Control Panels and Hardware  
407000 Instrumentation for Process Systems



## LIST OF DRAWINGS

Project/Contract Numbers: 80001977

Project Title: Prospect Elevated Water Storage Tank

Sheet Number	Drawing Number	Title	Dated
1	G001	Cover	3/22/2021
2	G002	Index	3/22/2021
3	C001	Civil Notes, Abbreviations, & Legends	3/22/2021
4	C002	Survey Control	3/22/2021
5	C003	Overall Site Plan	3/22/2021
6	C004	Yard Piping Plan	3/22/2021
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9	A001	Architectural Legend and Abbreviations	3/22/2021
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11	A003	Elevated Storage Tank Pedestal Floor Plans and Details	3/22/2021
12	A004	Elevated Storage tank Elevations and Logo	3/22/2021
13	A005	Architectural Schedules and Details	3/22/2021
14	A006	Elevated Storage Tank Section and Details	3/22/2021
15	S001	Structural Legend	3/22/2021
16	S002	Structural Standard Details	3/22/2021
17	S003	Base Plan	3/22/2021
18	S004	Sections and Detail	3/22/2021
19	M001	Mechanical Legend, Abbreviations, and General Notes	3/22/2021
20	M002	Mechanical Plan, Schedules, and Sequence of Operations	3/22/2021
21	D001	Process Legend, Details, and General Notes	3/22/2021
22	D101	Elevated Tank Floor Plan	3/22/2021
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29	E001	Partial Electrical Legend, Partial One-Line Diagram and Panelboard Schedule	3/22/2021
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## INVITATION TO BID

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

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The General Services Department of Kansas City, Missouri will receive sealed Bids until 2:00 PM, on Tuesday, **February 28, 2023** at 4800 E. 63<sup>rd</sup> St. Trfwy, Kansas City, MO 64130 for **Project/Contract Number: 80001977/9618 – Prospect Elevated Water Storage Tank**. Bids will be opened after that time.

City desires that Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) have a maximum opportunity to participate in the performance of City contracts. The goals for this specific Project are **(7%) MBE** participation and **(4%) WBE** participation.

Bidding Documents will be available online to all interested parties at the Kansas City, Missouri Plan Room, <http://www.kcmoplanroom.org>. All addenda will be posted at this location. Any document or plan may be viewed or downloaded from this location.

Bidders are requested to attend the **Mandatory**, Pre-Bid Conference at **Tuesday February 14<sup>th</sup>, 2023**, at Water Services Department Auditorium **4800 E 63<sup>rd</sup> Street Trfwy**

Project Manager: John Reddy  
Phone Number: (816) 513-0377  
Fax Number: (816) 513-0343  
E-mail: [John.Reddy@kcmo.org](mailto:John.Reddy@kcmo.org)

Contract Administrator: Bridgette Atkinson  
Phone Number: 816-513-0177  
Fax Number: 816-513-0543  
E-mail: Bridgette.Atkinson@kcmo.org

View all procurement and contracting opportunities at <http://www.kcmo.gov>



## INSTRUCTIONS TO BIDDERS

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

1. Sealed Bids for **Project/Contract Number: 80001977/9618 – Prospect Elevated Water Storage Tank** will be received by the KC Water Department at 4600 E. 63<sup>rd</sup> St. Trfwy, Kansas City, MO 64130 until 2:00 P.M., February 28, 2023 at which time bidding will be closed.
  - a. All Bids will be opened and read aloud. The Bid Envelope must contain all required submissions to be included with the Bid. No Bid may be withdrawn for a period of ninety (90) days after the Bid is opened. Bid security shall likewise continue for the same ninety (90) days unless earlier released by the City. The successful Bidder shall comply with all Bidding and contract requirements. Bids, once opened and read, may not be withdrawn without forfeiture of the Bid security.
  - b. All Bids shall be addressed to the Wes Minder, Director of KC Water, shall state on the outside of the sealed Bid envelope “Bid Enclosed”, title and Project number, and shall be deposited in the locked Bid box. All Bids must comply with the Bidding Requirements of Kansas City, Missouri (CITY).
2. Consideration of Bids
  - a. The City will determine the lowest, responsive and responsible Bid. The City may reject any or all bids. If the City rejects all Bids, the City may: (1) resolicit Bids following the City’s normal solicitation procedure; or (2) solicit Bids only from those Bidders that submitted a Bid pursuant to the original solicitation; or (3) use an expedited Bid submission schedule with or without readvertising or issuing any other public notice when the City determines that the delay from the normal City solicitation procedure would not be in the City's best interests.
  - b. Alternates. If this solicitation includes Bid Alternates, the City, in its sole discretion, may include any, all or none of the Alternates in determining the lowest, responsive and responsible Bid. In determining lowest, responsive and responsible Bid, the City may include the Alternates in any combination and in any order or priority or choose none of the Alternates. The City may make this determination at any time after Bid Closing and prior to Contract award. The City will act in the best interest of the City in determining whether to include any, all or none of the Alternates and the combination and priority of any Alternates selected. If additional funding becomes available after Contract award, City may add any or all of the Alternates to the Contract by change order.
3. Evidence of Competency to Perform. Each bidder shall furnish with the bid satisfactory evidence of Bidder’s competency to perform the proposed work. Such evidence of competency shall consist of the following:
  - a. Completed Form 00410.01 Experience Reference Summary for three projects of similar scope performed within the past 5 years including the name, address and telephone number of the contact person having knowledge of the project and the dollar value of the project.
  - b. Statement that, during the three (3) years immediately preceding the date of the Bid, Bidder has received no written notices of violations of any federal or state prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or Bidder has been found in such but has made restitution to affected workmen and complied with any statutory penalty; and a

statement that Bidder is current on payment of Federal and State income tax withholdings and unemployment insurance payments

- c. Statement that Bidder participates in a training program that facilitates entry into the construction industry and which may include an on-the-job or in-house training program. By submitting its Bid, Bidder is agreeing to timely submit during the 48 hours after Bid opening an affidavit of describing such program and Bidder's participation.
- d. Identify the following Key Personnel proposed for the Project. (**NOTE:** Key Personnel must be committed to the Project for its duration, and may not be removed or substituted without the City's prior written consent.)
  - (1) GC Project Manager
  - (2) On-Site Field Superintendent
  - (3) QC/QA Manager
  - (4) Safety Officer
- e. For each of the Key Personnel, provide the following background information.
  - (1) Years of employment with current employer
  - (2) City of residence
  - (3) Identify any other projects this person will be involved with concurrently with the Project, and state the time commitment for the Project and each other project
  - (4) Discuss professional registrations, education, certifications, and credentials held by this person that are applicable to the Project
- f. Discuss generally the tasks involved in the Project.
- g. Illustrate clearly and concisely Bidder's understanding of the technical elements that must be addressed for successful completion of the Project.
- h. Submit a bid schedule with anticipated milestones for the Project using Microsoft Project 2007 or later format.
- i. Describe key issues that might affect the Project schedule and how Bidder proposes to address them.
- j. Summary of the Project Safety Plan for the Project.
  - (1) Describe how Bidder proposes to address any unique safety issues for the Project
  - (2) Describe your safety record and environmental compliance record along with your Firm's OSHA reportable accident rates on recent comparable size projects
  - (3) Statement of Bidder's Experience Modification Ratio (EMR)
- k. Discuss Bidder's understanding of the traffic control required for the Project, if applicable, and how traffic control will impact the Project schedule. Discuss any major traffic control issues that need to be addressed and Bidder's proposed solutions.
- l. Identify any other special issues or problems that are likely to be encountered. Outline the manner in which Bidder suggests resolving them.
- m. Outline key community relations issues and how they might be resolved.
- n. Describe any difficulties Bidder anticipates encountering in serving the City, in light of the City's status as a municipality and public entity. Explain how Bidder plans to manage them.
- o. Summary of Bidder's Quality Assurance/Quality Control Plan for this project
- p. Statement regarding all work performed two (2) years immediately preceding the date of the Bid, that contains either (a) a contract by contract listing of any written notices of violations of any

federal, state or local DBE/MBE/WBE Program and any damages assessed; or (b) a statement that there have been no such written notices of violations or such penalties assessed; and a statement that Program requirements have been met.

- q. Statement that the Bidder has not been rescinded or debarred from any bidding, contractual, procurement, or other such programs by federal, state or local entities.
- r. Statement that Bidder is current on payment of Federal and State income tax withholdings and unemployment insurance payments
- s. Statement of Bidder's litigation and/or arbitration history over the past five (5) years including final ruling.
- t. Statement of Bidder's bond history over the past five (5) years including any incidences of failure to perform.
- u. MBE / WBE past project performance and compliance with participation goals in comparable size commercial projects

4. Waiver of Bid Requirements The City Manager or his delegate at any time may waive any requirements imposed by this solicitation or by any City regulation when failure to grant the waiver will result in an increased cost to the City and the requirement waived would be waived for all Bidders for this solicitation and it is in the best interest of the City to grant the waiver. The City Council at any time may waive any requirements imposed in this solicitation by the City's Code of Ordinances when it finds failure to grant the waiver will result in an increased cost to the City and the waived requirement would be waived for all Bidders for this solicitation and it is in the best interest of the City to grant the waiver. The City reserves the right to waive any irregularities and/or formalities as deemed appropriate.

5. Late Bids Bids and modifications of Bids received after the exact hour and date specified for receipt will not be considered unless: (1) the Bid is sent via the U.S. Postal Service, common carrier or contract carrier, by a delivery method that guarantees the Bid will be delivered to the City prior to the submission deadline; or (2) if the Bid is submitted by mail, common carrier or contract carrier it is determined by the City that the late receipt was due solely to an error by the U.S. Postal Service, common carrier or contract carrier; or (3) the Bid is timely delivered to the City but is at a different City location than that specified in this IFB; or (4) the City extends the time after the deadline for a force majeure event that could potentially affect any or all Bidders meeting the deadline.

6. Interpretations and Addenda All questions about the meaning or intent of the Bidding Documents may be directed to the Project Manager listed at the end of these Instructions to Bidders. Interpretations or clarifications considered necessary by the Project Manager in response to such questions will be issued by Addenda to all parties recorded as having received the Bidding Documents. Questions received less than ten (10) days prior to the date for opening of Bids may not be answered. Only answers issued by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. Addenda may also be issued to modify the Bidding Documents as deemed advisable by the City.

7. Bid Security Requirements All Bids submitted must be accompanied by a Bid deposit in the amount of five percent (5%) of the base Bid which shall be in the form of a Bid Bond (on the form provided in these Bidding Documents), Cashier's Check, Letter of Credit, Certificate of Deposit or other instrument approved in advance by the City. Prior to submittal of the Bid the City Treasurer must approve both the financial institution and text of a Letter of Credit. A Cashier's Check or a Certificate of Deposit shall be payable to the City Treasurer.

8. Forfeiture of Security If a Bidder fails or refuses to execute the Contract when requested by the City, any Bid security given to the City shall immediately become due and payable and forfeited to the City as liquidated damages.

9. Mistake in Bid Security By submitting a Bid, Bidder is agreeing to correct any mistakes on a Bid security submission when requested by the City. When such a mistake occurs and a Bidder fails or refuses to correct the mistake or execute the Contract when requested by the City, any Bid security shall be forfeited to the City and the Bidder shall also be subject to debarment and damages.

10. Bids that Exceed the Engineer's Estimate The City may offer the apparent lowest, responsive and responsible Bidders the option of performing the Work for the Engineer's estimate for the Project with no changes to the Bid requirements or scope of the Project if the Bid is not more than five percent higher than the Engineer's estimate.

11. Post Bid Required Submissions The successful Bidder will be required to submit the following documents with the signed copies of the Bid Form/Contract or within the timeframes specified in the Notice of Intent to Contract letter. Copies of the City's forms that the successful Bidder will be required to sign are bound into this Project Manual for information:

- a. Properly signed, dated, and sealed Performance and Maintenance Bond and Payment Bond;
- b. Properly completed certificates of insurance;
- c. Copies of licenses required by the City to do the Work;
- d. A copy of CONTRACTOR's current Certificate of Good Standing or Fictitious Name Registration from the Missouri Secretary of State, or other acceptable proof; and

12. Indemnification – City of Kansas City. The contract documents contains a requirement that Contractor shall indemnify, defend and hold harmless the City and any of its agencies, officials, officers, or employees from and against all claims, damages, liability, losses, costs, and expenses, including reasonable attorneys' fees, arising out of or resulting from any acts or omissions in connection with the contract, caused in whole or in part by Contractor, its employees, agents, or Subcontractors, or caused by others for whom Contractor is liable, including negligent acts or omissions of the City, its agencies, officials, officers, or employees. The contract requires Contractor to obtain specified limits of insurance to insure the indemnity obligation. Contractor has the opportunity to recover the cost of the required insurance in the Contract Price by including the cost of that insurance in the Bid amount.

13. City's Buy American and Missouri Preference Policies It is the policy of the City that any manufactured goods or commodities used or supplied in the performance of any City contract or any subcontract thereto shall be manufactured or produced in the United States whenever possible. When Bids offer quality, price, conformity with specifications, term of delivery and other conditions imposed in the specifications that are equal, the City shall select the Bid that uses manufactured goods or commodities that are manufactured or produced in the United States. The City shall give preference to all commodities manufactured, produced, or grown within the State of Missouri and to all firms, corporations, or individuals doing business as Missouri firms, corporations or individuals, when quality is equal or better and delivered price is the same or less. It is the bidder's responsibility to claim these preferences.

14. Affirmative Action It is the policy of the City that any person or entity entering into a contract with the City, will employ applicants and treat employees equally without regard to their race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age. Bidder will be required to comply with the City's Affirmative Action ordinance if Bidder is awarded a contract from the City totaling more than \$300,000.00. If you have any questions regarding the City's Affirmative Action requirements, please contact HRD at (816) 513-1836 or visit the City's website at [www.kcmo.gov](http://www.kcmo.gov).

15. Tax Clearance Bidder will be required to furnish to CITY sufficient proof from City's Commissioner of Revenue, verifying that Bidder is in compliance with the license and tax ordinances administered by City's Revenue Division as a precondition to CITY making its first payment under any CONTRACT over \$160,000.00. Bidder will also be required to obtain proof of City tax compliance from all of its Subcontractors prior to the Subcontractors performing any Work.

16. Substitutions or "Or-Equal" Items The procedure for submission of substitutions or "or-equal" items is set forth in the General Conditions and Supplementary Conditions.

17. Prevailing Wage Requirements The successful Bidder shall pay the prevailing hourly rate of wages as determined by the Missouri Annual Wage Order and/or Federal Wage Determination set forth in the Project Manual. In case of a conflict between Missouri and Federal wage rates, the higher rate shall apply.

Successful Bidder shall be required to use City's Internet web based Prevailing Wage Reporting System provided by City and protocols included in that software during the term of this Contract. When

requested by the City, Bidder shall submit user applications to City's provided Prevailing Wage Reporting System for all applicable personnel and shall require subcontractors to submit same.

18. Contract Information Management System. Successful Bidder shall be required to use City's Internet web based Contract Information Management System/Project Management Communications Tool provided by City and protocols included in that software during the term of this Contract. Bidder/Proposer shall submit user applications to City's provided Contract Information Management System for all personnel, subcontractors or suppliers as applicable.

19. MBE/WBE Program Requirements City desires that Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) have a maximum opportunity to participate in the performance of City contracts. The goals for this specific Project are **(7%)** MBE participation and **(4%)** WBE participation. The City's HRD Forms and HRD Instructions for Construction Projects are incorporated into these Bidding Documents and the Contract Documents. The MBE/WBE Directory is available on the City's website at [www.kcmo.gov](http://www.kcmo.gov). Please call the Human Relations Department at (816) 513-1836 for assistance.

Successful Bidder shall be required to use City's Internet web based MBE/WBE Program Reporting System provided by City and protocols included in that software during the term of this Contract. When requested by the City, Bidder shall submit user applications to City's provided MBE/WBE Program Reporting System for all applicable personnel and shall require subcontractors/subconsultants to submit same.

20. Waiver of MBE/WBE Requirements The City Council may waive any and all MBE/WBE requirements imposed by any Bidding Document or the MBE/WBE Ordinance and Contract with the lowest, responsive and responsible Bidder if the City Council determines a waiver is in the best interests of the City.

21. Forfeiture of Bid Bond for Failure to Make MBE/WBE Submissions By submitting its Bid, Bidder is agreeing to the following: (1) Bidder has made by Bid opening a good faith effort to meet the MBE/WBE goals established for the Project; or Bidder will continue to make during the 48 hours after Bid opening a good faith effort to meet the MBE/WBE goals established for the Project; and (2) Bidder will timely submit its 00450 HRD Construction Contractor Utilization Plan/Request for Waiver (HRD Form 8) and 00450.01 Letter of Intent to Subcontract for each MBE/WBE listed on the 00450 HRD Construction Contractor Utilization Plan/Request for Waiver; and (3) Bidder will submit documentation of its good faith efforts to meet the MBE/WBE goals when requested by the City. Failure to meet these requirements in good faith will result in Bidder being debarred and forfeiting its Bid Bond.

22. Workforce Program Requirements. City desires that minorities and women have a maximum opportunity to practice their trades on city construction projects. The minimum company-wide goals are a ten percent **(10%)** minority workforce and two percent **(2%)** women workforce. The City's HRD Forms and HRD Instructions for Construction Projects are incorporated into these Bidding Documents and the Contract Documents.

Successful Bidder shall be required to use City's Internet web based Workforce Program Reporting System provided by City and protocols included in that software during the term of this Contract. When requested by the City, Bidder shall submit user applications to City's provided Workforce Program Reporting System for all applicable personnel and shall require subcontractors to submit same.

23. Subcontractors, Suppliers and Others

a. If the Contract Documents require the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to City, the apparent lowest, responsive and responsible Bidder, and any other Bidder so requested, shall submit to City a list of all such Subcontractors, Suppliers and other persons and organizations proposed for those portions of the Work for which such identification is required. An experience statement shall accompany such list with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier or organization if requested by City. If City has reasonable objection to any proposed Subcontractor, Supplier or other person or organization,

City may request the apparent lowest, responsive and responsible Bidder to submit an acceptable substitute without an increase in Bid price.

b. By submitting its Bid, Bidder agrees that it has read and understands all the provisions of General Condition No. 6.07, Concerning Subcontractors, Suppliers and Others, and that it will comply with all those provisions including but not limited to mandatory mediation of disputes and the prohibition against paid-if-paid and paid-when-paid contract clauses. It is the City's expectation that all Subcontractors and Suppliers will be treated fairly and in good faith by the successful Bidders and that the successful Bidder will make all reasonable efforts to resolve contract disputes with a Subcontractor or Supplier in a prompt and fair manner. If the City is notified by a Subcontractor or Supplier of a contract claim with the successful Bidder, City will notify the successful Bidder and will request prompt resolution of the claim. City will provide any such Subcontractor or Supplier information regarding mandatory mediation as well as a copy of the Payment Bond. City may notify the Surety that City has taken cognizance of such claim.

c. In accordance with the Missouri Prompt Payment Act, City reserves the right to withhold payment(s) in good faith from the successful Bidder due to: i)the successful Bidder's failure to comply with any material provision of the contract; ii)third party claims filed or reasonable evidence that a claim will be filed; iii)the successful Bidder's failure to make timely payments for labor, equipment or materials; or iv)for damage to a Subcontractor or Supplier.

d. By submitting its Bid, Bidder agrees it will not deny any Subcontractor subcontracting opportunities solely because the Subcontractor is not a signatory to collective bargaining agreements with organized labor.

e. The provisions of GC 6.07 are a material term of the Contract with the City and failure by the successful Bidder to comply with the provisions of this section will be taken into consideration by City in making the determination of lowest, responsive and responsible bidder in any subsequent City contracts.

24. **Pre-Bid Conference** the Water Services Department will hold a pre-Bid conference on **Tuesday February 14<sup>th</sup>**, at 2:00 P M in the Auditorium Room, located at \_4800 E 63<sup>rd</sup> Street, Kansas City, Missouri 64130. Attendance at the pre-Bid conference is **mandatory** for all Bidders on this Project. For this Project, the City shall not contract with a Bidder who has not attended the entire pre-Bid conference for this Project.

25. **On-Site Inspection** The Project Site will be available for inspection by Bidders. Bidders visiting the Project Site shall be responsible for their own safety. The Project Site shall be available for inspection by appointment from 9:00 AM to 4:00 /PM each day Monday through Friday (holidays excepted). Bidders may contact the following individual from the \_Water Services Department for an appointment.

Contact: John Reddy

Phone: (816) 813-0377 /E-mail [john.reddy@kcmo.org](mailto:john.reddy@kcmo.org)

26. **Signatures** Each copy of the Bid Form/Contract must be signed and properly dated by the following, as applicable:

Limited Liability Company:

a member of the limited liability Company authorized to sign on behalf of the company.

Partnership:

a partner authorized to sign on behalf of the partnership.

Sole Proprietor:

the proprietor.

Joint Venture:

the parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture.

Corporation:

- a corporate office authorized to sign on behalf of the corporation. Corporation's seal must be attached to the signature.

27. Forward all questions in writing to the following Project Manager and Contract Administrator. Questions received less than **Five (5)** days prior to the Bid Date may not be answered. Interpretations or clarifications considered necessary by the Project Manager in response to such questions will be issued by Addenda to all Bidders. Oral or other interpretations or clarifications shall be without legal effect, even if made at a Pre-Bid Meeting.

John Reddy, Project Manager  
Water Services Department  
Floor Number 2  
4800 E 63<sup>rd</sup> Street  
Kansas City, MO, 64130  
(816) 513-0377  
E-mail: [John.Reddy@kcmo.org](mailto:John.Reddy@kcmo.org)

Bridgette Atkinson, Contract Administration  
Water Services Department  
Floor Number 1  
4800 E 63<sup>rd</sup> Street  
Kansas City, MO, 64130  
(816) 513-0177  
(816) 513-0543  
E-mail: [Bridgette.Atkinson@kcmo.org](mailto:Bridgette.Atkinson@kcmo.org)



*For persons with disabilities needing reasonable accommodations please contact Jean Lawson at 816-513-6566. If you need to use the Relay Service, please dial 711.*

Bidder: \_\_\_\_\_

CITY OF FOUNTAINS  
HEART OF THE NATION



KANSAS CITY  
MISSOURI

## BID FORM/CONTRACT

Project/Contract Number: 80001977/9618

Project Title: ProspectProspectProspectProspect Elevated Water Storage TankTankTankTank

1. Bidder, having examined the Bidding Documents, related documents and the Site of the Work, and being familiar with all the conditions affecting the construction of the proposed Work, including Laws and Regulations and the availability of materials and supplies, agrees, if this Bid is selected by CITY, this Bid Form/Contract will become the Contract between Bidder and CITY for Bidder to furnish all labor and materials, equipment and services necessary for the proper completion of the Work in accordance with the Contract Documents, including general construction work at the price(s) stated below, which stated sums include fees and all other charges applicable to materials, appliances, labor and all things subject to and upon which other charges may be levied.
2. Bidder agrees the Contract Documents will comprise the entire agreement between CITY and Bidder. The Contract Documents are identified in the General Conditions and are incorporated into and made part hereof this Bid Form/Contract by reference.
3. Bidder agrees that if this Bid Form/Contract is executed by CITY, Bidder's offer is accepted and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the parties. Bidder authorizes the CITY to fill in the Contract Price on this Bid Form/Contract in accordance with Bidder's Bid. Bidder agrees that this Bid Form/Contract may be executed in one or more counterparts, each of which will be deemed an original copy of this Bid Form/Contract and all of which, when taken together, will be deemed to constitute one and the same Bid Form/Contract. This Bid Form/Contract shall be effective upon the execution of counterparts by both parties, notwithstanding that both parties may not sign the same counterpart. The parties' signatures transmitted by facsimile or by other electronic means shall be proof of the execution of this Bid Form/Contract and shall be acceptable in a court of law. A copy of this Bid Form/Contract shall constitute an original and shall be acceptable in a court of law.
4. The Bid Price(s) shall be shown in numeric figures only.
5. **TOTAL BASE**The undersigned Bidder has given CITY'S Project Manager written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by the Project Manager or by the DESIGN PROFESSIONAL is acceptable to Bidder.
6. The undersigned Bidder agrees that this Bid shall remain subject to selection by CITY, and may not be withdrawn for ninety (90) days after the day Bids are opened.
7. *Form* 00412004120041200412 Unit Prices contain prices included in the Base Bid, and isisis incorporated into this Bid. Form(s) must be completed and returned with this Bid.



Bidder: \_\_\_\_\_

**BIDDER PARTICIPATION:** \_\_\_\_\_% MBE \_\_\_\_\_% WBE \_\_\_\_\_% DBE

15. To the best of Bidder's knowledge, the following are names of certified MBEs and/or WBEs with whom Bidder, or Bidder's subcontractors, presently intend to contract with if awarded the Contract on the above project: **(All firms must currently be certified by Kansas City, Missouri Human Relations Department)**

A. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

B. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

C. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

D. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

E. Name of M/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone No. \_\_\_\_\_  
I.R.S. No. \_\_\_\_\_  
Area/Scope of work \_\_\_\_\_  
Subcontract amount \_\_\_\_\_

*(List additional MBE/WBEs, if any, on additional pages and attach to this form)*

16. By submitting its bid, Bidder is agreeing it will identify and timely submit within 48 Hours after Bid opening those MBE/WBE subcontractors with dollar amounts and scopes of work, which apply to or exceed the MBE/WBE goals for the Project on the **00450 HRD 08 Contractor Utilization Plan/Request for Waiver**.

17. Bidder agrees that failure to meet or exceed the MBE/WBE Goals for the above project will require the Director of Human Relations to recommend disapproval of the bid unless the Director of Human Relations finds the Bidder established good faith efforts towards meeting the goals as set forth in the HRD Forms and Instructions for Construction Projects and the City's MBE/WBE Ordinance.

Bidder: \_\_\_\_\_

Business Entity Type:

- Missouri Corporation
- Foreign Corporation
- Fictitious Name Registration
- Sole Proprietor
- Limited Liability Company
- Partnership
- Joint Venture
- Other: (Specify) \_\_\_\_\_

**BIDDER**

Legal name & address of Bidder, person firm, partnership, corporation, or association submitting Bid:

\_\_\_\_\_ Phone No: \_\_\_\_\_

Cell No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

Bidder's E-Mail: \_\_\_\_\_

\_\_\_\_\_ Federal ID. No. \_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Bidder, person, firm, partnership, corporation or association submitting Bid.

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name)

Title: \_\_\_\_\_

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

(Attach corporate seal if applicable)

**NOTARY**

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

My Commission Expires: \_\_\_\_\_

Bidder: \_\_\_\_\_

**ACCEPTANCE OF BID**

CITY, by executing this Bid Form/Contract, hereby accepts Bidder’s Bid and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the Parties.

CITY shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents a maximum amount of \_\_\_\_\_ Dollars, (\$ \_\_\_\_\_). The Contract Price includes:

*[Specifier: Select applicable Bid items and delete those that are not required.]*

00411 Itemized Prices, included in the Bid, a copy of which is attached

00412 Unit Prices, included in the Bid, a copy of which is attached

00413 Allowances, included in the Bid, a copy of which is attached

00420 Alternates, included in the Bid, a copy of which is attached

Alternate No. 1 - \$

Alternate No. 2 - \$

By executing this Bid Form/Contract, CITY accepts Bidder’s offer for the Contract Price stated above and this Bid Form/Contract that incorporates all other Contract Documents shall constitute the Contract between the parties

\_\_\_\_\_  
City of Kansas City, Missouri (OWNER or City)

Approved as to form:

\_\_\_\_\_  
Assistant City Attorney

I hereby certify that there is a balance, otherwise unencumbered, to the credit of the appropriation to which the foregoing expenditure is to be charged, and a cash balance, otherwise unencumbered, in the treasury, to the credit of the fund from which payment is to be made, each sufficient to meet the obligation hereby incurred.

\_\_\_\_\_  
Director of Finance (Date)



# EXPERIENCE AND REFERENCE SUMMARY

Project/Contract Number: 80001977/9618

Project Title: 3.0 Million Gallon Elevated Storage Tanks

<b>Firm's Legal Name</b>	
<b>Mailing Address</b>	
<b>Contact – Name &amp; Email</b>	
<b>Contact – Phone &amp; Fax</b>	

NO.	PROJECT & LOCATION	OWNER NAME & ADDRESS CONTACT & PHONE NUMBER	PROJECT DURATION & DATE COMPLETED	\$ VALUE
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				



## EXPERIENCE AND REFERENCE SUMMARY – CURRENT PROJECTS

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

Page \_\_\_\_ of \_\_\_\_

<b>Firm's Legal Name</b>	
<b>Mailing Address</b>	
<b>Contact – Name &amp; E-Mail</b>	
<b>Contact – Phone &amp; Fax</b>	

NO.	PROJECT & LOCATION	CONTRACT AMOUNT/ % COMPLETE	OWNER NAME & ADDRESS CONTACT & PHONE NUMBER	LENGTH, DIAMETER & MATERIAL OF CONSTRUCTION OR DESCRIPTION OF REPAIRS	START DATE
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					



## LIST OF EQUIPMENT AND STAFFING AVAILABLE FOR PROJECT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

Page \_\_\_\_ of \_\_\_\_

	EQUIPMENT AVAILABLE FOR CONSTRUCTION (OR ATTACH LIST)		STAFFING BREAKDOWN	NUMBER OF EACH CATEGORY
1.		1.	OFFICE STAFF	
2.		2.	SUPERVISORS	
3.		3.	FIELD STAFF – CREW FOREMEN	
4.		4.	FIELD STAFF – OPERATORS (NOT FOREMEN)	
5.		5.	FIELD STAFF – LABORERS (NOT FOREMEN)	
6.		6.		





## BID BOND

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tank

Bond Number \_\_\_\_\_

**KNOW ALL MEN BY THESE PRESENTS:** That \_\_\_\_\_ of \_\_\_\_\_, as Principal, and \_\_\_\_\_ as Surety, hereby bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents unto KANSAS CITY, MISSOURI, a constitutionally chartered municipal corporation, as Obligee, in the sum of

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_), lawful money of the United States.

**WHEREAS**, Principal is herewith submitting its Bid to enter into a contract with Kansas City for the above referenced project,

**NOW, THEREFORE** the condition of this obligation is such that if the Principal is awarded the contract the Principal will, within the time required, enter into a contract and give a good and sufficient surety bonds to secure the performance of the terms and conditions of the contract and for the prompt payment of all labor and material furnished in the prosecution thereof as required by the contract documents, then this obligation shall be void; otherwise the Principal and Surety will immediately pay unto the Obligee the full amount of this bond as liquidated damages for failure to fulfill the conditions of this obligation, but in no event shall the Surety's liability exceed the penal sum hereof.

Signed, sealed and delivered this \_\_\_\_\_ day of \_\_\_\_\_.

### BIDDER AND PRINCIPAL

Name, address and facsimile number of Bidder and Principal

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Bidder and Principal.

By: \_\_\_\_\_

Title: \_\_\_\_\_

(Attach corporate seal if applicable)

**SURETY**

Name, address and facsimile number of Surety:

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I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A- or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By: \_\_\_\_\_

Title: \_\_\_\_\_

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

(Attach seal and Power of Attorney)

**HRD INSTRUCTIONS  
FOR CONSTRUCTION CONTRACTS**

**PART A. MINORITY/WOMEN BUSINESS ENTERPRISE REQUIREMENTS**

**I. City's MBE/WBE Program.**

- A. The City has adopted a Minority/Women Business Enterprise ("MBE/WBE") Program (Sections 3-421 through 3-469, Code of Ordinances) (the "Program") to implement the City's policy of supporting the fullest possible participation in City contracts and change orders of firms owned and controlled by minorities and women. Each construction contract may have an MBE and/or WBE goal for participation. An MBE or WBE goal is a numerical objective the City has set for the contract that may be awarded pursuant to these bid specifications. Goals are stated as a percentage of contract dollars. For example, if an MBE goal for a contract is 10% and a Bidder submits a bid of \$100,000, the goal for MBE participation would equal \$10,000. The specific MBE/WBE goals on this contract are set forth elsewhere in the bid specifications.
- B. These Human Relations Department ("HRD") Forms & Instructions are part of the BIDDING DOCUMENTS and CONTRACT DOCUMENTS as defined in the General Conditions. By submitting a Bid, the Bidder agrees, as a material term of the contract, to carry out the City's MBE/WBE Program by making good faith efforts to include certified MBE/WBEs in the contract work to the extent of the goals listed for the contract and to the fullest extent consistent with submitting the lowest and best bid to the City. Bidder agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Bidder in fact meet or exceed both the MBE and WBE Goals, it is a requirement for approval of the Bid that a Bidder objectively demonstrate to the City that good faith efforts have been made to meet the Goals. Bidders must attempt to meet both the MBE and WBE goals and request a waiver if either is not met.
- C. The following HRD Forms are attached and must be used for MBE/WBE submittals:
1. Contractor Utilization Plan/Request for Waiver (HRD Form 8); and
  2. Letter of Intent to Subcontract (HRD Form 00450.01); and
  3. Timetable for MBE/WBE Utilization (HRD Form 10); and
  4. Request for Modification or Substitution (HRD Form 11); and
  5. Contractor Affidavit for Final Payment (Form 01290.14); and
  6. Subcontractor Affidavit for Final Payment (Form 01290.15).

Warning: The City only gives MBE/WBE credit for a Bidder's use of City certified MBE/WBEs. A certified MBE/WBE firm is a firm that has been certified by the City's Human Relations Department as such. An MBE/WBE firm must be certified before the date on which the contractor utilization plan is due. Certified MBEs and WBEs are listed in the M/W/DBE Kansas City Mo. Online Directory, which is available on the City's website at [www.kcmo.org](http://www.kcmo.org). Before a Bidder submits a bid, Bidder should contact HRD and consult the directory to make sure any firm proposed for use for MBE/WBE participation has been certified.

## II. Required Submissions Following Bid Opening.

- A. Bidder must submit the following documents within forty-eight (48) hours of bid opening:
1. **Contractor Utilization Plan/Request for Waiver (HRD Form 8).** This form states a Bidder's plan to use specific certified MBE/WBEs in the performance of the contract and includes the following:
    - a. The work to be performed by each MBE/WBE and the amounts each is to be paid for the work; and
    - b. The name, address, race or ethnic origin, gender and employer identification number or social security number of each MBE/WBE that will perform the work.
    - c. An automatic request for waiver in the event Bidder has not met or exceeded the MBE and/or WBE goals for the contract but believes that it has made good faith efforts to meet or exceed the goals and desires a waiver of the goals. If a waiver is requested, HRD will examine the Bidder's documentation of good faith efforts and make a recommendation to grant or deny the waiver. HRD will recommend a waiver be granted only if the Bidder has made good faith efforts to obtain MBE/WBE participation.
  2. **Letter(s) of Intent to Subcontract (HRD Form 00450.01).** A letter must be provided from each MBE/WBE listed on the Contractor Utilization Plan. These letters verify that the MBE/WBE has agreed to execute a formal agreement for the work and indicate the scope of work to be performed and the price agreed upon for the work.

## III. Required Submission when Requested by City.

- A. Bidder must submit the following documents when requested by City:
1. **Timetable for MBE/WBE Utilization (HRD Form 10).**
  2. **Documentation of good faith efforts.**

## IV. Required Monthly Submissions during term of Contract.

- A. Bidder must submit the following document on a monthly basis if awarded the contract:
1. **M/WBE Monthly Utilization Report.** This report must be submitted to the Director by the 15<sup>th</sup> of each month. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications. The preferred method of submission of this report is through the B2GNow Diversity Management System (B2GNow) HRD Form 00485.01 may be submitted in lieu of the B2GNow system under certain conditions, with the consent of HRD.

## V. Required Submittals for Final Contract Payment.

- A. Contractor must submit the following documents with its request for final payment under the contract:
1. **Contractor Affidavit for Final Payment (Form 01290.14)**

2. **Subcontractor Affidavit(s) for Final Payment (Form 01290.15)**
3. **Final B2GNow Monthly Contract Audit Report with all payment audits confirmed.**
- 4.

#### **VI. Additional Submittals.**

- A. Contractor may be required to make additional submittals during the term of the Contract, including **Request for Modification or Substitution (HRD Form 11)**. Refer to Section IX, Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE, for additional instructions on when this form must be submitted.

#### **VII. MBE/WBE Participation Credit.**

- A. The following shall be credited towards achieving the goals:
  1. The total contract dollar amount that a prime contractor has paid or is obligated to pay to a subcontractor that is a certified MBE or WBE, except as otherwise expressly provided for herein.
  2. The total contract dollar amount that a prime contractor that is a certified MBE or WBE performed itself.
  3. Sixty percent (60%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supplier who is a certified MBE or WBE.
  4. Ten percent (10%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supply broker who is a certified MBE or WBE.
  5. One hundred percent (100%) of the total dollar amount paid or to be paid by a prime contractor to a manufacturer of construction supplies who is a certified MBE or WBE.
  6. Subcontractor participation with a lower tier MBE/WBE subcontractor using one of the above methods of participation.
- B. **NO CREDIT**, however, will be given for the following:
  1. Participation in a contract by a MBE or WBE that does not perform a commercially useful function as defined by the Program; and
  2. Any portion of the value of the contract that an MBE or WBE subcontractor subcontracts back to the prime contractor or any other contractor who is not a qualified MBE/WBE; and
  3. Materials and supplies used on the contract unless the MBE/WBE is responsible for negotiating the price, determining quality and quantity, ordering the materials and installing (where applicable) and paying for material itself; and
  4. Work performed by an MBE or WBE in a scope of work other than that in which the MBE or WBE is currently certified.

#### **VIII. Methods for Securing Participation of MBE/WBEs and Good Faith Efforts.**

- A. A bidder is required to make good faith efforts to achieve the MBE/WBE goals. Good faith efforts are efforts that, given all relevant circumstances, a Bidder actively and aggressively seeking to meet the goals can reasonably be expected to make. Good faith efforts must be made before the Bidder submits a Contractor Utilization Plan, in other words, within 48 hours of bid opening. However, efforts made to increase participation of MBEs and WBEs following submission of the CUP can be considered as evidence of good faith efforts to meet the goals.
- B. In evaluating good faith efforts, the Director of HRD will consider whether the Bidder has performed the following, along with any other relevant factors:
1. Advertised for at least 15 calendar days prior to the bid or proposal due date opportunities to participate in the contract in general circulation media, trade and professional association publications, small and minority business media, and publications of minority and women's business organizations which are included in a list along with their current contact information identified on the directory as the list of publications available to publish such advertisements, which list shall be updated by HRD no less than every three (3) month.
  2. Sent written notices at least fifteen (15) calendar days prior to the bid or proposal due date containing the information required in section (9) below, by certified mail, e-mail, or facsimile, to at least 80% of MBEs and WBEs which are included in a list along with their contact information identified on the directory as the list of organizations available to receive such notices, which list shall be updated by HRD no less than every three (3) months.
  3. Sent written notices, containing the information required by section (9) below, by certified mail, e-mail or facsimile, to at least 80% of MBEs and WBEs listed on the directory certified in the applicable scopes of work for the particular bid soliciting their participation in the contract at least 15 calendar days prior to the bid or proposal due date.
  4. Attempted to identify portions of the work for qualified MBE and/or WBE participation in order to increase the likelihood of meeting the goals, including breaking down contracts into economically feasible units that take into consideration the capacity of available MBE/WBEs appearing on the HRD directory.
  5. At any time prior to submission of the CUP or submittal of a request for modification of a CUP, requested assistance in achieving the goals from the director and acted on the director's recommendations.
  6. Conferred with certified MBEs and WBEs which inquired about or responded to the bid solicitation and explained to such MBEs and WBEs the scope and requirements of the work for which their bids or proposals were solicited, and if not all certified MBEs and WBEs in the particular scopes listed on the directory have inquired about or responded to the bid solicitation for each scope of work, then contact by certified mail, e-mail or telephone the greater of ten (10) or 80% of additional certified MBEs and WBEs in the particular scopes of work listed on the directory and offer to confer with such MBEs and WBEs for such particular scope of work and request such MBEs and WBEs to submit a proposal.

7. Attempted to negotiate in good faith with certified MBEs and WBEs which responded to the bid solicitation or those certified MBEs and WBEs that were conferred with as contemplated in section (6) above, and other qualified MBEs and WBEs, at the option of the bidder, proposer, or contractor, as applicable, to perform specific subcontracts, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities by the bidder, proposer, or contractor; in the event an MBE or WBE is the low bid, but rejected as unqualified, the bidder, proposer, or contractor and the director or board, as applicable, shall provide sound reasons for rejecting such MBE or WBE.
8. Attended pre-bid meeting when such meetings were indicated in the solicitation of bids or otherwise by the bidder, proposer, or contractor, as applicable or by the director provided the director provides written direction to the bidder, proposer, or contractor at the time the goals are recommended.
9. Written notices and advertisements to be provided pursuant to sections (1), (2) and (3) above shall include the following information:
  - a. The bid due date;
  - b. The name of the project;
  - c. The address or general location of the project;
  - d. The location of plans and specifications for viewing;
  - e. Contact information of the prime contractor;
  - f. A general description of the scopes of work that are the subject of the solicitation;
  - g. The goals established for the applicable contract, and if the goals are still subject to board approval, then a statement that the goals as stated are preliminary and are subject to board approval;
  - h. If the project or any portion of the project is subject to prevailing wage then a statement that all or a portion of the project will be subject to prevailing wage, as applicable; and if only a portion of the scopes are subject to prevailing wage, then identification of such scopes provided that such scopes are known as of the time of bid solicitation;
  - i. The date and time of any pre-bid meeting(s), if any, which have been scheduled by the bidder, proposer, contractor or developer as of the bid solicitation; and

Any other information deemed relevant by the bidder, proposer, contractor or developer, as applicable, or the director to the extent the director provides written direction to the bidder, proposer, contractor or developer of such additional information at the time the goals are recommended by the director. 8. Within five (5) working days after drawing the bid specifications, sent certified letters, verifiable e-mails or proof of facsimiles to certified MBEs and WBEs listed in the M/W/DBE Kansas City Mo. Online Directory.

C. A Bidder may be required to give the City documentation to prove that it made good faith

efforts. The Bidder will be contacted by the City with further instructions about when this documentation must be submitted.

#### **IX. Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE.**

- A. After bid opening, a Bidder or Contractor may need to substitute an MBE and/or WBE or request that the amount of MBE/WBE participation listed in its Contractor Utilization Plan be modified. Bidder or Contractor must file a **Request for Modification or Substitution (HRD Form 11)** prior to actual substitution and within a reasonable time after learning that a modification or substitution is necessary. The Director may approve substitutions or modifications and upon approval, the modifications and substitutions will become an amendment to the Contractor Utilization Plan. Modifications or substitutions may be approved when:
1. The Director finds that the Bidder or Contractor made and provided evidence of good faith efforts to substitute the MBE/WBE listed on the Contractor Utilization Plan with other certified MBE/WBEs for the scope of work or any other scope of work in the contract; and
  2. The Bidder or Contractor has not attempted intentionally to evade the requirements of the program and it is in the best interests of the City to allow a modification or substitution; and
  3. The Director also finds one of the following:
    - a. The listed MBE/WBE is non-responsive or cannot perform; or
    - b. The listed MBE/WBE has increased its previously quoted price to the bidder, proposer or contractor without a corresponding change in the scope of the work; or
    - c. The listed MBE/WBE has committed a material default or breach of its contract with the contractor; or
    - d. Requirements of the scope of work of the contract have changed and render subcontracting not feasible or not feasible at the levels required by the goals established for the contract; or
    - e. The listed MBE/WBE is unacceptable to the contracting department; or
    - f. The listed MBE/WBE thereafter had its certification revoked; or
- B. A modification shall not be made unless the modification or substitution has first been requested and approved by the Director. Once a modification has been made, a Construction Contractor Employee Identification Report (HRD Form 0485.04) for the newly approved subcontractor must be submitted at least ten (10) days prior to the approved subcontractor commencing work on a City contract.

#### **X. Appeals.**

- A. In conformance with the Act, appeals may be made to the City Fairness in Construction Board or Fairness in Professional Services and Goods Board on the following:
1. The grant or denial of a Request for Waiver;
  2. Substitution for an MBE/WBE listed on a Contractor Utilization Plan;

3. Modification of the percentage of MBE/WBE participation on a Contractor Utilization Plan;
  4. Liquidated Damages;
  5. The amount of MBE/WBE credit the Contractor may receive for MBE/WBE participation identified in the contractor utilization plan.
- B. Any appeal must be filed in writing with the Director within fifteen (15) calendar days of notice of the determination. Mailing, faxing, personal delivery or posting at HRD of determinations shall constitute notice. The appeal shall state with specificity why the Bidder or Contractor believes the determination is incorrect
- C. Failure to file a timely appeal shall constitute a waiver of a Bidder's or Contractor's right to appeal such determination and such person shall be estopped to deny the validity of any determination which could have been timely appealed.

#### **XI. Access to Documents and Records.**

- A. By submitting a Bid, each Bidder agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Bidder as may be necessary to ascertain compliance with the requirements of this document and the Act, within ten (10) calendar days of the date of the written request.
- B. All Bidders agree to cooperate with the contracting department and HRD in studies and surveys regarding the MBE/WBE program.

#### **XII. Miscellaneous.**

- A. A Bidder or Contractor shall bear the burden of proof with regard to all issues on appeal.
- B. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.
- C. Oral representations are not binding on the City.
- D. The City Council may waive the requirements of this document and the Program and award the contract to the lowest and best bidder if the City Council determines a waiver is in the best interests of the City.
- E. The Director may grant extensions of time to Bidders to submit Letters of Intent to Subcontract (HRD Form 00450.01).

#### **XIII. Liquidated Damages – MBE/WBE Program.**

- A. If Contractor fails to achieve the MBE/WBE goals stated in its Contractor Utilization Plan, as amended, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. Therefore, in order to liquidate those damages, the monetary difference between either (1) the amount of the MBE/WBE goals set forth in the Contractor Utilization Plan, as amended, or (2) the goals established (whichever is lower) and the amount actually paid to qualified MBEs and WBEs for performing a commercially useful function will be deducted from the Contractor's payments as liquidated damages. In determining the amount actually paid to qualified MBEs and WBEs, no credit will be given for the portion of participation that was not approved by the Director, unless the Director determines that the Contractor acted in good faith. No

deduction for liquidated damages will be made when, for reasons beyond the control of the Contractor, the MBE/WBE participation stated in the Contractor Utilization Plan, as amended and approved by the Director is not met.

## **PART B. CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS**

**IMPORTANT:** This Part B is applicable to City construction contracts estimated by the City prior to solicitation as: (1) requiring more than 800 construction labor hours and (2) valued in excess of \$300,000.00. This program is distinguished from the M/WBE Program in that it is based on workforce hours of the Bidder and *all* its participating subcontractors rather than the actual contract value of work. The instructions herein detail the specifics related to this program. This program is in *addition* to the M/WBE program.

### **I. City's Construction Employment Program.**

- A. The City has adopted a Construction Employment Program (Sections 3-501 through 3-525, Code of Ordinances) (the "Workforce Program" or "Program") to implement the City's policy of supporting the fullest possible utilization of minority and women workers in the construction industry.
- B. The minimum workforce goals are currently set by ordinance at 10% for minorities and 2% for women. These goals are separate from M/WBE goals. Public recognition may be provided if the bidder achieves at least twice the minimum participation.
- C. Construction contracts subject to the Workforce Program and the company-wide and project-specific workforce goals ("workforce goals") are those contracts to construct, reconstruct, improve, enlarge or alter any fixed work that is estimated by the City prior to solicitation to: (1) require more than 800 construction labor hours, (2) has estimated costs that exceed \$300,000.00, and (3) involve the expenditure of public funds.
- D. The successful bidder may meet company-wide goals by counting the bidder's utilization of minorities and women throughout the Kansas City metropolitan statistical area. . In addition, the successful Bidder is responsible to ensure that it and its subcontractors cumulatively make good faith efforts to meet project-specific goals for utilization of minorities and women.
- E. These Human Relations Department ("HRD") Forms & Instructions are part of the BIDDING DOCUMENTS and CONTRACT DOCUMENTS as defined in the General Conditions. By submitting a Bid, the Bidder agrees, as a material term of the contract, to carry out the City's Construction Employment Program by making good faith efforts to utilize minority and women workers to the fullest extent consistent with submitting the lowest and best bid to the City. Bidder agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Bidder in fact meet or exceed the construction employment goals to receive approval

from HRD, a Bidder not doing so is required to objectively demonstrate to HRD that good faith efforts have been made.

- F. The following HRD Forms are to be used for Construction Employment Program submittals:
1. Project Workforce Monthly Report (HRD Form 00485.02)
  2. Company-Wide Workforce Monthly Report (HRD Form 00485.03)

## II. Required Submissions.

- A. Within forty-eight (48) hours after bid opening, the construction contractor shall submit the **Construction Employee Identification Report** (HRD Form 00485.03) and shall include: the name, home address, job title, sex and race/ethnicity of each person working for the Prime. The individuals to be listed on the form are those which the construction contractor *anticipates* will be performing construction labor hours creditable towards the minimum workforce goals applicable to the construction contractor individually.

The following circumstances also require the submission of a Construction Employee Identification Report:

- a. Prior to contract execution for those City construction contracts awarded pursuant to a request for proposals (RFP), the construction contractor shall submit a **Construction Employee Identification Report** (HRD Form 00485.03).
  - b. At least ten (10) days prior to the date upon which any subcontractor is to commence work under a City construction contract, the Prime shall submit a **Construction Employee Identification Report** (HRD Form 00485.03) for the subcontractor.
- B. The HRD Director has established the B2GNow Diversity Management System (“B2GNOW”) (an online reporting tool) as the preferred method for fulfilling reporting requirements of the Workforce Program. The HRD Director will allow paper submission of the following HRD Forms in lieu of on-line submission if the on-line submission process presents a hardship to the contractor:
1. **Project-Specific Workforce Monthly Report (HRD Form 00485.02)**
  2. **Company-Wide Workforce Monthly Report (HRD Form 00485.03)**
- C. Bidder must submit the following documents through B2GNow or in paper format on a monthly basis if awarded the contract:
1. **Project Workforce Monthly Report (HRD Form 00485.02).** This report is contract specific. This report must be submitted to the Director by the 15<sup>th</sup> of each month for the Contractor and each subcontractor. It will be utilized to report the Contractor’s own workforce compliance data with regard to the City’s construction contract. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.
  2. **Company-Wide Workforce Monthly Report (HRD Form 00485.03).** This report

is not contract specific; it is used to report on the utilization of women and minorities, by trade, company-wide. This report must be submitted to the Director by the 15<sup>th</sup> of each month. It will be utilized to report the Contractor's own workforce compliance data with regard to every contract (both privately and publicly funded) that the Contractor has in progress throughout the Kansas City Metropolitan Statistical Area. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

### **III. Submittal Required for Final Contract Payment.**

- A. The final Project Workforce Monthly Report(s) and Company-Wide Workforce Monthly Report must be submitted before final payment will be made and/or retainage released. Contractor shall note the submittal of the final reports by notation in the box entitled "Final Report"

### **IV. Methods for Securing Workforce Participation and Good Faith Efforts.**

- A. A bidder is required to make good faith efforts to achieve the construction employment goals and ensure its subcontractors are making good faith efforts to achieve the construction employment goals. If a Bidder or its subcontractors will be unable to secure enough minority and female participation to meet or exceed the construction employment goals, a bidder must, within a reasonable time after so learning, request a waiver or modification of the goals by the Director of HRD. The Director will request evidence of the Bidder's and its' subcontractors' good faith efforts to meet the goals. The Director will examine the Bidder's request and the Bidder's documentation of good faith efforts for itself and its subcontractors. The Director will examine the Bidder's request and the Bidder's documentation of good faith efforts and grant or deny a waiver or modification. The Director will grant a waiver or modification only if the Bidder has made good faith efforts to secure minority and female participation.

**IMPORTANT:** The Bidder's subcontractors on a city construction contract must meet the workforce goals collectively. The bidder is responsible to ensure the subcontractors make good faith efforts to meet the workforce goals. Bidders are required to include language in its subcontracts that ensure the subcontractors make good faith efforts to meet or exceed the workforce goals.

- B. In evaluating good faith efforts, the Director will consider whether the Bidder and its subcontractors have performed the following:
  1. For those bidders that are not signatories to a collective bargaining agreement with organized labor:
    - a. Requested in writing the assistance of the Director with respect to efforts to promote the utilization of minorities and women in the workforce and acted upon the Director's recommendations; and
    - b. Advertised in minority or women trade association newsletters and/or minority or women owned media at least 15 calendar days prior to the utilization of any construction services on the city construction contract and used terminology that sufficiently describes the work available, the pay scale,

- the application process, and anything else that one might reasonably be expected to be informed of relevant to the position being advertised; and
- c. Maintained copies of each advertisement and a log identifying the publication and date of publication; and
  - d. Conducted real and substantial recruitment efforts, both oral and written, targeting resident, minority and women community-based organization, schools with a significant minority student population, and training organizations serving the recruitment area; and
  - e. Established and maintained a current list of resident, minority and women recruitment sources, providing written notification to the recruitment sources of available employment opportunities, and maintained records of the notices submitted to the organizations and any responses thereto; and
  - f. Maintained a current file for the time period of the city construction contract with the name, address, and telephone number of each resident, minority and woman job applicant, the source of the referral, whether or not the person was hired, and in the event that the applicant was not hired, the reason therefore; and
  - g. Promoted the retention of minorities and women in its workforce with the goals of achieving sufficient annual hours for minorities and women to qualify for applicable benefits; and
  - h. Required by written contract that all subcontractors comply with the above efforts.
2. For those bidders that are signatories to collective bargaining agreements with organized labor:
- a. Requested in writing from each labor union representing crafts to be employed that:
    - i. the labor union make efforts to promote the utilization of residents of the City, minorities and women in the workforce; and
    - ii. the labor union identify any residents of the City, minorities and women in its membership eligible for employment; and
  - b. Collaborated with labor unions in promoting mentoring programs for journeypersons intended to assist minorities and women in increasing retention with the goals of achieving sufficient annual hours to qualify for applicable benefits; and
  - c. Maintained a current file with the name, address, and telephone number of each resident, minority and women worker identified by the labor union, whether or not the person was hired, and in the event the person was not hired, the reason therefore.
  - d. To the extent the good-faith efforts applicable to bidders that are signatories to collective bargaining agreements with organized labor conflict with the procedures implemented by the bidder in order to comply with the relevant

bargaining agreement, the bidder shall substitute other procedures as may be approved by the Director in writing, in order to accomplish the purpose and intent of this section.

- C. In the event workforce goals are not met or there is anticipation that goals will not be met, a Bidder will be required to give the City documentation to prove that it and/or its subcontractors made good faith efforts. The Bidder will be contacted by the City with further instructions about when this documentation must be submitted.

#### **V. Access to Documents and Records.**

- A. By submitting a Bid, each Bidder agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Bidder as may be necessary to ascertain compliance with the requirements of this document and the Program, within ten (10) days of the date of the written request. Each bidder further agrees to require, if awarded the contract, that every subcontractor permit the City the same access to documents and records.
- B. All Bidders agree to cooperate with the contracting department and HRD in studies and surveys regarding the construction employment program.

#### **VI. Appeals.**

- A. In conformance with the Program, appeals may be made to the Construction Workforce Board on the following:
  - 1. Determinations by the Director that a contractor did not meet the construction employment goals and did not make a good faith effort to meet the goals;
  - 2. Recommendations by the Director to assess liquidated damages;
  - 3. Recommendation by the Director that a contractor be declared ineligible to receive any city construction contract for a period of time up to one year.
- B. Any appeal must be filed in writing with the Director within ten (10) working days of notice of the recommendation or determination. The appeal shall state with specificity why the Bidder or Contractor believes the recommendation or determination is incorrect.
- C. Failure to file a timely appeal shall constitute a waiver of a Bidder's or Contractor's right to appeal such determination or recommendation and such person shall be estopped to deny the validity of any order, determination, recommendation or action of HRD which could have been timely appealed.

#### **VII. Miscellaneous.**

- A. A Bidder or Contractor shall bear the burden of proof with regard to all issues on appeal.
- B. The successful bidder may be required to meet with the Director of HRD or the Director's designee for the purpose of discussing the construction employment program, the bidder's efforts to realize the goals, and any other problems and/or issues affecting the realization of the goals or the program in general.
- C. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.
- D. Oral representations are not binding on the City.

## **VIII. Failure to Meet Workforce Goals**

- A. If Contractor or its subcontractors fail to achieve the construction employment goals or make good faith efforts to achieve those goals without having previously obtained a waiver or modification of those goals, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. These damages are magnified if the failure to abide by the requirements of the Workforce Program is recurring. Therefore, if the directory finds that the contractor or subcontractor have not met, or made good faith efforts to meet, the construction employment goals for any quarter, the director may:
1. Assess liquidated damages against the construction contractor, as specified in the city construction contract;
  2. Require the contractor to attend mandatory training, as specified in the construction contract;
  3. Declare the contractor ineligible to receive any city construction contract or participate as a subcontractor under any city construction contract for a period of time up to six months, as specified in the construction contract.

## **IX. First Source Program**

- A. The City has established a labor force recruiting program intended to assist contractors in identifying, interviewing and hiring qualified job applicants residing in Kansas City, Missouri. While the contractor awarded a City construction contract is not prohibited from hiring persons residing outside Kansas City, Missouri, the recruiting resource provided for herein (the "First Source Program") must be utilized by the contractor subject to the construction employment goals as set forth in this **PART B, CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS**.
- B. The City utilizes the services of the Full Employment Council, Inc., to administer the First Source Program. The contractor shall contact the Full Employment Council within 48 hours of contract award, regardless of whether the contractor has any hiring needs at that time, and within 48 hours following any job vacancy which the contractor reasonably anticipates filling during the term of the City construction contract. The contractor shall comply with the First Source Program requirements as implemented by the Full Employment Council unless otherwise excused in writing by the Director of HRD for good cause shown. To ensure compliance with the First Source Program, the contractor shall contact those persons at the Full Employment Council responsible for administering the program, which may be identified by visiting their website at [www.feckc.org](http://www.feckc.org) and clicking on the link for KCMO First Source Hiring Program. The contractor shall not hire any individual to provide construction services on a City construction contract unless the contractor has met the requirements of the First Source Program.
- C. The contractor shall require that its subcontractors utilize the First Source Program to the same extent that the contractor is required to do so, and shall incorporate the requirements of this Section IX into every subcontract. Every subcontractor shall be required to contact the Full Employment Council within 48 hours of subcontract award, regardless of whether the subcontractor has any hiring needs at that time, and within 48 hours following any job vacancy which the subcontractor reasonably anticipates filling during the term of their subcontract on a City construction project.



Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

c. Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

d. Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

e. Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

f. Name of M/WBE Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone No. \_\_\_\_\_  
 I.R.S. No. \_\_\_\_\_

*(List additional M/WBEs, if any, on additional page and attach to this form)*

4. The following is a breakdown of the percentage of the total contract amount that Bidder/Proposer agrees to pay to each listed M/WBE:

**MBE/WBE BREAKDOWN SHEET**

**MBE FIRMS:**

Name of MBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**TOTAL MBE \$ / TOTAL MBE %:** \$ \_\_\_\_\_ %

**WBE FIRMS:**

Name of WBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**TOTAL WBE \$ / TOTAL WBE %:** \$ \_\_\_\_\_ %

\*“Subcontract Amount” refers to the dollar amount that Bidder/Proposer has agreed to pay each M/WBE subcontractor as of the date of contracting and is indicated here solely for the purpose of calculating the percentage that this sum represents in proportion to the total contract amount. Any contract amendments and/or change orders changing the total contract amount may alter the amount due an M/WBE under their subcontract for purposes of meeting or exceeding the Bidder/Proposer participation.

\*\*“Weighted Value” means the portion of the subcontract amount that will be credited towards meeting the Bidder/Proposer participation. See HRD Forms and Instructions for allowable credit and special instructions for suppliers.

5. Bidder/Proposer acknowledges that the monetary amount to be paid each listed M/WBE for their work, and which is approved herein, is an amount corresponding to the percentage of the total contract amount allocable to each listed M/WBE as calculated in the MBE/WBE Breakdown Sheet. Bidder/Proposer further acknowledges that this amount may be higher than the subcontract amount listed therein as change orders and/or amendments changing the total contract amount may correspondingly increase the amount of compensation due an M/WBE for purposes of meeting or exceeding the Bidder/Proposer participation
6. Bidder/Proposer acknowledges that it is responsible for considering the effect that any change orders and/or amendments changing the total contract amount may have on its ability to meet or exceed the Bidder/Proposer participation. Bidder/Proposer further acknowledges that it is

responsible for submitting a Request for Modification or Substitution if it will be unable to meet or exceed the Bidder/Proposer participation set forth herein.

7. If Bidder/Proposer has not achieved both the M/WBE goal(s) set for this Project, Bidder/Proposer hereby requests a waiver of the MBE and/or WBE goal(s) that Bidder/Proposer has failed to achieve
8. Bidder/Proposer will present documentation of its good faith efforts, a narrative summary detailing its efforts and the reasons its efforts were unsuccessful when requested by the City.
9. I hereby certify that I am authorized to make this Affidavit on behalf of the Bidder/Proposer named below and who shall abide by the terms set forth herein:

Bidder/Proposer primary contact: \_\_\_\_\_

Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Facsimile number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

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

(Attach corporate seal if applicable)

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

My Commission Expires: \_\_\_\_\_

\_\_\_\_\_  
Notary Public



# LETTER OF INTENT TO SUBCONTRACT

Select one:

Original LOI:

Updated LOI:

Project Name/Title \_\_\_\_\_

Project Location/Number \_\_\_\_\_

**PART I:** Prime Contractor \_\_\_\_\_ agrees to enter into a contractual agreement with M/W/DBE/Section 3 Subcontractor \_\_\_\_\_ who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

for an estimated amount of \$ \_\_\_\_\_ (or \_\_\_\_\_% of the total estimated contract value.)

M/WBE Vendor type: **Subcontractor/manufacture**r (counts as 100% of contract value towards goals)  
**Supplier** (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)  
**Broker** (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE/Section 3 Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Human Relations Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

**PART 2:** This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one: The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)  
The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: \_\_\_\_\_

Full address: \_\_\_\_\_  
Street number and name City, State and Zip Code

Primary contact: \_\_\_\_\_  
Name Phone

a) This subcontractor is (select one): MBE WBE DBE N/A

- i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.
- ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: \_\_\_\_\_

c) The dollar value of this agreement is: \_\_\_\_\_

**PART 3:** Please complete fields below, print, sign/notarize and submit.

**NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI);  
SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).**

PRIME CONTRACTOR BUSINESS NAME: \_\_\_\_\_

\_\_\_\_\_  
Signature: Prime Contractor

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

State of \_\_\_\_\_ )

County of \_\_\_\_\_ )

I, \_\_\_\_\_, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this  
day of \_\_\_\_\_, 20\_\_\_\_

My Commission Expires: \_\_\_\_\_  
Notary Public

STAMP:

MWDBE SUBCONTRACTOR BUSINESS NAME: \_\_\_\_\_

\_\_\_\_\_  
Signature: Subcontractor

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

State of \_\_\_\_\_ )

County of \_\_\_\_\_ )

I, \_\_\_\_\_, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this  
day of \_\_\_\_\_, 20\_\_\_\_

My Commission Expires: \_\_\_\_\_  
Notary Public

STAMP:





# REQUEST FOR MODIFICATION OR SUBSTITUTION

(This Form **must** be submitted to HRD to request substitutions for an MBE/WBE listed in the Contractor Utilization Plan or for modification of the amount of MBE/WBE participation listed in the Contractor Utilization Plan. This Form shall be an amendment to the Contractor Utilization Plan.)

**BIDDER/PROPOSER/CONTRACTOR:** \_\_\_\_\_  
**ADDRESS:** \_\_\_\_\_  
**PROJECT NUMBER OR TITLE:** \_\_\_\_\_  
**AMENDMENT/CHANGE ORDER NO: (if applicable)** \_\_\_\_\_

**Project Goals:** \_\_\_\_\_ % MBE \_\_\_\_\_ % WBE  
**Contractor Utilization Plan:** \_\_\_\_\_ % MBE \_\_\_\_\_ % WBE

1. I am the duly authorized representative of the above Bidder/Contractor/Proposer and am authorized to request this substitution or modification on behalf of the Bidder/Contractor/Proposer.

2. I hereby request that the Director of HRD recommend or approve: (check appropriate space(s))

a. \_\_\_\_\_ A substitution of the certified MBE/WBE firm \_\_\_\_\_,  
(Name of new firm)  
to perform \_\_\_\_\_,  
(Scope of work to be performed by new firm)

for the MBE/WBE firm \_\_\_\_\_ which is currently  
(Name of old firm)  
listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan to  
perform the following scope of work: \_\_\_\_\_.  
(Scope of work of old firm)

b. \_\_\_\_\_ A modification of the amount of MBE/WBE participation currently listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan from  
\_\_\_\_\_ % MBE \_\_\_\_\_ % WBE (Fill in % of MBE/WBE Participation currently listed on Contractor Utilization Plan)

**TO**

\_\_\_\_\_ % MBE \_\_\_\_\_ % WBE (Fill in New % of MBE/WBE Participation requested for Contractor Utilization Plan)

- c. Attach 00450.01 Letter of Intent to Subcontract letter for each new MBE/WBE to be added.
- d. Attach a copy of the most recent 00485.01 or on-line M/WBE Monthly Utilization Report

3. Bidder/Contractor/Proposer states that a substitution or modification is necessary because: (check applicable reason(s) )

- \_\_\_ The MBE/WBE listed on the Contractor Utilization Plan is non-responsive or cannot perform.
- \_\_\_ The MBE/WBE listed on the Contractor Utilization Plan has increased its previously quoted price without a corresponding change in the scope of work.
- \_\_\_ The MBE/WBE listed on the Contractor Utilization Plan has committed a material default or breach of its contract.
- \_\_\_ Requirements of the scope of work of the contract have changed and make subcontracting not feasible or not feasible at the levels required by the goals established for the contract.
- \_\_\_ The MBE/WBE listed on the Contractor Utilization Plan is unacceptable to the City contracting department.
- \_\_\_ Bidder/Contractor/Proposer has not attempted intentionally to evade the requirements of the Act and it is in the best interests of the City to allow a modification or substitution.

4. The following is a narrative summary of the Bidder's/Contractor's/Proposer's good faith efforts exhausted in attempts to substitute the MBE/WBE firm named above which is currently listed on the Contractor Utilization Plan with other qualified, certified MBE/WBE firms for the listed scope of work or any other scope of work in the project:

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5. Bidder/Proposer/Contractor will present documentation when requested by the City to evidence its good faith efforts.

Dated: \_\_\_\_\_

\_\_\_\_\_  
(Bidder/Proposer/Contractor)

By: \_\_\_\_\_  
(Authorized Representative)

## **HRD MONTHLY REPORTING INSTRUCTIONS**

### **M/WBE Monthly Utilization Report Instructions**

1. MBE/WBE Reporting applies to Contracts that have approved MBE/WBE goals assigned.
2. The City will utilize a web based MBE/WBE Reporting System in the administration of this Contract. This web based application database is a collaboration tool selected and provided by City, which will allow Contractors and Consultants/Subcontractors and Subconsultants to enter data and report on compliance.

### **Prevailing Wage Certified Payroll Report Instructions**

1. Prevailing Wage Certified Payroll Report applies to Contracts that include Prevailing Wage or Davis Bacon Provisions.
2. This web based application database is provided by City for reporting certified payrolls and other related prevailing wage data.
3. Computer Requirements: Minimum Intel Pentium® 4 Processor 2.4 GHz or equivalent processor with 512MB of RAM; recommended Centrino Duo® Processors 1.6 GHz or equivalent with 2GB of RAM, or higher.
  - a. Computer Operation System: Windows XP, Windows Vista, or Windows 7
  - b. Web Browser: Google Chrome
  - c. Connection Speed/Minimum Bandwidth: DSL, ADSL or T1 Line for transferring a minimum of 3 Mbps Downstream and 512 Kbps Upstream
4. City will assist Contractor in providing training of personnel and Subcontractor's personnel.
5. Contractor and Subcontractors shall have the responsibility for visiting the web site and entering data in on timely basis, and as necessary to be in compliance with Prevailing Wage Requirements included in their contracts.

### **Workforce Monthly Report Instructions**

1. Workforce Monthly Reporting only applies to Construction Contracts greater than \$300,000 and greater than 800 projected labor hours.
2. The City will utilize a web based Reporting System in the administration of this Contract. This web based application database is a collaboration tool selected and provided by City, which will allow Contractors and Subcontractors to enter data and report on Workforce compliance.





## CONTRACT REQUIRED SUBMISSIONS

Project/Contract Number: 80001977/9618

Project Title: 3.0 Million Gallon Elevated Storage Tanks

These instructions are to assist Contractor in providing all necessary documents to enter into a contract with the City.

### **MISSOURI SECRETARY OF STATE BUSINESS ENTITY REGISTRATION**

- For a corporation, current Certificate of Good Standing from the Missouri Secretary of State ((816) 889-2925 or (816) 889-2926 or a web site print-out, dated no more than ninety (90) days before the date furnished to the City – One Copy.
- For a business that is not a corporation and not doing business in the exact name of the proprietor, a copy from the Secretary of State, ((816) 889-2925 or (816) 889-2926 of the filed Registration of Fictitious Name dated no more than ninety (90) days before the date furnished to the City – One Copy.

### **EMPLOYEE ELIGIBILITY VERIFICATION AFFIDAVIT** [Required if the contract exceeds \$5,000.00]

- 00515.01 Employee Eligibility Verification Affidavit – One Executed Affidavit
- First and last pages of the E-Verify Program Memorandum of Understanding that your company has received from the U.S. Department of Homeland Security verifying enrollment in the program. For assistance, contact E-Verify Operations at 888-464-4218 – One Copy.

### **SUBCONTRACTORS LISTING** [Applicable form provided]

- Non-Construction Subcontractors List – One Copy
- 01290.09 Subcontractors & Major Material Suppliers List – One Copy

### **PAYMENT BONDS (If applicable)**

- Each copy of the Payment bond must be signed and properly dated by the following, as applicable:

**Corporation** - A corporate officer authorized to sign on behalf of the corporation and the signature must be attested by a witness to the signature; OR

**Limited Liability Company** - A member of the limited liability company authorized to sign on behalf of the company and a witness to the signature must attest the signature; OR

**Partnership** - A partner authorized to sign on behalf of the partnership and the signature must be attested by a witness to the signature; OR

**Sole Proprietor** - By the proprietor and the signature must be attested by a witness to the signature; OR

**Joint Venture** - The parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture; AND

**Surety** - A person authorized by the Surety to sign on behalf of the Surety. A power of attorney issued by the Surety Company authorizing its representative to sign the Agreement must be attached to the Agreement and each copy.

**PERFORMANCE AND MAINTENANCE BOND (If applicable)**

- As applicable, each copy of the Performance and Maintenance bond must be signed and properly dated by:

**Corporation** - A corporate officer authorized to sign on behalf of the corporation and the signature must be attested by a witness to the signature; OR

**Limited Liability Company** - A member of the limited liability company authorized to sign on behalf of the company and a witness to the signature must attest the signature; OR

**Partnership** - A partner authorized to sign on behalf of the partnership and the signature must be attested by a witness to the signature; OR

**Sole Proprietor** - By the proprietor and the signature must be attested by a witness to the signature; OR

**Joint Venture** - The parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture; AND

**Surety** - A person authorized by the Surety to sign on behalf of the Surety. A power of attorney issued by the Surety Company authorizing its representative to sign the Agreement must be attached to the Agreement and each copy.

**CERTIFICATES OF INSURANCE** [Sample form provided] - If you have any questions regarding requirements for insurance certificates, please contact the City's Risk Management Office, 816 513-1299.

- Provide a certificate of insurance for all insurance that may be required in the contract such as:
  - Commercial General Liability
  - Workers' Compensation and Employers' Liability
  - Commercial Automobile Liability
  - Railroad Protective Liability
  - Environmental Liability
  - Asbestos Liability
  - Longshoremen's Insurance
  - Property Insurance
- List the NAIC Number (National Association of Insurance Commissioners) or A.M. Best Number for each Insurer listed on the Certificate of Insurance.
- Certificate "Kansas City, Missouri" must named as an Additional Insured.
- Check the insurance requirements of the Contract. If Contract Documents require that other entities be included as additional insureds, each entity shall be listed on the certificate(s).
- Description of Operations must include Project/Contract Number and Project/Contract Title/Description as contained in the Contract Documents. The Certificate Holder and address block shall be completed as follows:
  - Kansas City, Missouri
  - [Name of applicable City Department]**
  - [Name of Contract Administrator, Buyer, or Project Manager]**
  - [Department Address]**
  - Kansas City, Missouri **[Zip Code]**
- If your insurance agent prepares an ACORD form, the automobile insurance must be "any auto" or better for acceptance by the City.

**AFFIRMATIVE ACTION REQUIREMENTS**

- Proposed Affirmative Action Program or a copy of a Certificate of Affirmative Action Compliance – One copy.

**PRE-CONTRACT BIDDER'S CERTIFICATION (Prevailing Wage Contracts; Form provided)**

- Submit form 00490 - Bidder's Pre-Contract Certification (provided).

**HEALTH AND SAFETY PLAN (If applicable)**

- Bidder's Health and Safety Plan – One copy or one CD Rom.



## CONTRACT REQUIRED SUBMISSIONS

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

These instructions are to assist Contractor in providing all necessary documents to enter into a contract with the City.

### **MISSOURI SECRETARY OF STATE BUSINESS ENTITY REGISTRATION**

- For a corporation, current Certificate of Good Standing from the Missouri Secretary of State ((816) 889-2925 or (816) 889-2926 or a web site print-out, dated no more than ninety (90) days before the date furnished to the City – One Copy.
- For a business that is not a corporation and not doing business in the exact name of the proprietor, a copy from the Secretary of State, ((816) 889-2925 or (816) 889-2926 of the filed Registration of Fictitious Name dated no more than ninety (90) days before the date furnished to the City – One Copy.

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- 00515.01 Employee Eligibility Verification Affidavit – One Executed Affidavit
- First and last pages of the E-Verify Program Memorandum of Understanding that your company has received from the U.S. Department of Homeland Security verifying enrollment in the program. For assistance, contact E-Verify Operations at 888-464-4218 – One Copy.

### **SUBCONTRACTORS LISTING** [Applicable form provided]

- Non-Construction Subcontractors List – One Copy
- 01290.09 Subcontractors & Major Material Suppliers List – One Copy

### **PAYMENT BONDS (If applicable)**

- Each copy of the Payment bond must be signed and properly dated by the following, as applicable:

**Corporation** - A corporate officer authorized to sign on behalf of the corporation and the signature must be attested by a witness to the signature; OR

**Limited Liability Company** - A member of the limited liability company authorized to sign on behalf of the company and a witness to the signature must attest the signature; OR

**Partnership** - A partner authorized to sign on behalf of the partnership and the signature must be attested by a witness to the signature; OR

**Sole Proprietor** - By the proprietor and the signature must be attested by a witness to the signature; OR

**Joint Venture** - The parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture; AND

**Surety** - A person authorized by the Surety to sign on behalf of the Surety. A power of attorney issued by the Surety Company authorizing its representative to sign the Agreement must be attached to the Agreement and each copy.

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- As applicable, each copy of the Performance and Maintenance bond must be signed and properly dated by:

**Corporation** - A corporate officer authorized to sign on behalf of the corporation and the signature must be attested by a witness to the signature; OR

**Limited Liability Company** - A member of the limited liability company authorized to sign on behalf of the company and a witness to the signature must attest the signature; OR

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**Sole Proprietor** - By the proprietor and the signature must be attested by a witness to the signature; OR

**Joint Venture** - The parties to the Joint Venture authorized to sign on behalf of each party to the Joint Venture, or a person authorized by each party to the Joint Venture to sign on behalf of all parties to the Joint Venture; AND

**Surety** - A person authorized by the Surety to sign on behalf of the Surety. A power of attorney issued by the Surety Company authorizing its representative to sign the Agreement must be attached to the Agreement and each copy.

**CERTIFICATES OF INSURANCE** [Sample form provided] - If you have any questions regarding requirements for insurance certificates, please contact the City's Risk Management Office, 816 513-1299.

- Provide a certificate of insurance for all insurance that may be required in the contract such as:
  - Commercial General Liability
  - Workers' Compensation and Employers' Liability
  - Commercial Automobile Liability
  - Railroad Protective Liability
  - Environmental Liability
  - Asbestos Liability
  - Longshoremen's Insurance
  - Property Insurance
- List the NAIC Number (National Association of Insurance Commissioners) or A.M. Best Number for each Insurer listed on the Certificate of Insurance.
- Certificate "Kansas City, Missouri" must named as an Additional Insured.
- Check the insurance requirements of the Contract. If Contract Documents require that other entities be included as additional insureds, each entity shall be listed on the certificate(s).
- Description of Operations must include Project/Contract Number and Project/Contract Title/Description as contained in the Contract Documents. The Certificate Holder and address block shall be completed as follows:
  - Kansas City, Missouri
  - [Name of applicable City Department]**
  - [Name of Contract Administrator, Buyer, or Project Manager]**
  - [Department Address]**
  - Kansas City, Missouri **[Zip Code]**
- If your insurance agent prepares an ACORD form, the automobile insurance must be "any auto" or better for acceptance by the City.

**AFFIRMATIVE ACTION REQUIREMENTS**

- Proposed Affirmative Action Program or a copy of a Certificate of Affirmative Action Compliance – One copy.

**PRE-CONTRACT BIDDER'S CERTIFICATION (Prevailing Wage Contracts; Form provided)**

- Submit form 00490 - Bidder's Pre-Contract Certification (provided).

**HEALTH AND SAFETY PLAN (If applicable)**

- Bidder's Health and Safety Plan – One copy or one CD Rom.

**EMPLOYEE ELIGIBILITY VERIFICATION AFFIDAVIT**

(Required for any contract with the City of Kansas City, Missouri in excess of \$5,000.00)

STATE OF \_\_\_\_\_ )  
 ) ss  
COUNTY OF \_\_\_\_\_ )

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me appeared \_\_\_\_\_, personally known by me or otherwise proven to be the person whose name is subscribed on this affidavit and who, being duly sworn, stated as follows:

I am of sound mind, capable of making this affidavit, and personally swear or affirm that the statements made herein are truthful to the best of my knowledge. I am the \_\_\_\_\_ (title) of \_\_\_\_\_ (business entity) and I am duly authorized, directed or empowered to act with full authority on behalf of the business entity in making this affidavit.

I hereby swear or affirm that the business entity does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U.S.C. § 1324a(h)(3).

I hereby additionally swear or affirm that the business entity is enrolled in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986, and that the business entity will participate in said program with respect to any person hired by the business entity to perform any work in connection with the contracted services. I have attached hereto documentation sufficient to establish the business entity’s enrollment and participation in the required electronic verification of work program.

I am aware and recognize that unless certain contractual requirements are satisfied and affidavits obtained as provided in Section 285.530, RSMo, the business entity may face liability for violations committed by its subcontractors, notwithstanding the fact that the business entity may itself be compliant.

I acknowledge that I am signing this affidavit as the free act and deed of the business entity and that I am not doing so under duress.

\_\_\_\_\_  
Affiant's signature

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission expires:



Missouri Department of Revenue  
**Project Exemption Certificate**

This form is to be completed and given to your contractor.

<b>Exempt Entity and Project Information</b>	Name of Exempt Entity Issuing the Certificate		Missouri Tax Exemption Number			
	Address		City		State	ZIP Code
	E-mail Address					
	Project Number	Project Begin Date (MM/DD/YYYY) ____/____/____		Estimated Project End Date (MM/DD/YYYY) ____/____/____		
	Description of Project					
	Project Location			Certificate Expiration Date (MM/DD/YYYY) ____/____/____		
	Provide a signed copy of this certificate, along with a copy of the exempt entity's Missouri Sales and Use Tax Exemption Letter to each contractor or subcontractor who will be purchasing tangible personal property for use in this project. It is the responsibility of the exempt entity to ensure the validity of the information on the certificate. The exempt entity must issue a new certificate if any of the information changes.					
Signature of Authorized Exempt Entity		Printed Name of Authorized Exempt Entity		Date (MM/DD/YYYY) ____/____/____		

<b>Contractor</b>	The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to <a href="#">Section 144.062, RSMo</a> . Under penalties of perjury, I declare that the above information and any attached supplement is true, complete, and correct.					
	Name of Purchasing Contractor		Signature of Contractor		Date (MM/DD/YYYY) ____/____/____	
	Address		City		State	ZIP Code

<b>Subcontractor</b>	Contractors - Present this to your supplier in order to purchase the necessary materials tax exempt. Complete the Subcontractor portion if extending the certificate to your subcontractor. The contractor must sign the form in the space provided below.					
	Name of Purchasing Subcontractor					
	Address		City		State	ZIP Code
	Signature of Contractor		Contractor's Printed Name		Date (MM/DD/YYYY) ____/____/____	

Form 5060 (Revised 08-2015)

Taxation Division  
P.O Box 358  
Jefferson City, MO 65105-0358

**Phone:** (573) 751-2836  
**Fax:** (573) 522-1271  
**E-mail:** [salestaxexemptions@dor.mo.gov](mailto:salestaxexemptions@dor.mo.gov)

Visit <http://dor.mo.gov/business/sales/sales-use-exemptions.php> for additional information.





# State of Missouri

## EXEMPTION FROM MISSOURI SALES AND USE TAX ON PURCHASES

Issued to:

CITY OF KANSAS CITY  
414 E 12TH ST 3RD FLOOR  
KANSAS CITY MO 64106

Missouri Tax ID  
Number: 12490466

Effective Date:  
07/11/2002

Your application for sales/use tax exempt status has been approved pursuant to Section 144.030.1, RSMo. This letter is issued as documentation of your exempt status.

Purchases by your Agency are not subject to sales or use tax if within the conduct of your Agency's exempt functions and activities. When purchasing with this exemption, furnish all sellers or vendors a copy of this letter. This exemption may not be used by individuals making personal purchases.

A contractor may purchase and pay for construction materials exempt from sales tax when fulfilling a contract with your Agency only if your Agency issues a project exemption certificate and the contractor makes purchases in compliance with the provisions of Section 144.062, RSMo.

Sales by your Agency are subject to all applicable state and local sales taxes. If you engage in the business of selling tangible personal property or taxable services at retail, you must obtain a Missouri Retail Sales Tax License and collect and remit sales tax.

This is a continuing exemption subject to legislative changes and review by the Director of Revenue. If your Agency ceases to qualify as an exempt entity, this exemption will cease to be valid. This exemption is not assignable or transferable. It is an exemption from sales and use taxes only and is not an exemption from real or personal property tax.

Any alteration to this exemption letter renders it invalid.

If you have any questions regarding the use of this letter, please contact the Division of Taxation and Collection, P.O. Box 3300, Jefferson City, MO 65105-3300, phone 573-751-2836.



# PERFORMANCE AND MAINTENANCE BOND

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_, as PRINCIPAL (CONTRACTOR), and \_\_\_\_\_, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a Contract with OWNER for \_\_\_\_\_ which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract including all duly authorized changes thereto, and including any maintenance requirements contained therein, according to all the terms thereof, including those under which CONTRACTOR agrees to pay legally required wage rates including the prevailing hourly rate of wages in the locality, as determined by the Department of Labor and Industrial Relations or by final judicial determination, for each craft or type of workman required to execute the Contract and, further, shall defend, indemnify, and hold harmless OWNER from all damages, including but not limited to, liquidated damages, loss and expense occasioned by any failure whatsoever of said CONTRACTOR and SURETY to fully comply with and carry out each and every requirement of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**CONTRACTOR**

Name, address and facsimile number of Contractor

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: \_\_\_\_\_  
Title: \_\_\_\_\_

(Attach corporate seal if applicable)

**SURETY**

Name, address and facsimile number of Surety:

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I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-, V, or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Reinsuring Companies: as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

(Attach seal and Power of Attorney)



## PAYMENT BOND

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

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KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_, as PRINCIPAL (CONTRACTOR), and \_\_\_\_\_, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a contract with OWNER for \_\_\_\_\_, which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if in connection with the Contract, including all duly authorized modifications thereto, prompt payment shall be made to all laborers, subcontractors, teamsters, truck drivers, owners or other suppliers or for equipment employed on the job, and other claimants, for all labor performed in such work whether done for CONTRACTOR, a subcontractor, SURETY, a completion contractor or otherwise (at the full wage rates required by any law of the United States or of the State of Missouri, where applicable), for services furnished and consumed, for repairs on machinery, for equipment, tools, materials, lubricants, oil, gasoline, water, gas, power, light, heat, oil, telephone service, grain, hay, feed, coal, coke, groceries and foodstuffs, either consumed, rented, used or reasonably required for use in connection with the construction of the work or in the performance of the Contract and all insurance premiums, both for compensation and for all other kinds of insurance on the work, for sales taxes and for royalties in connection with, or incidental to, the completion of the Contract, in all instances whether the claim be directly against CONTRACTOR, against SURETY or its completion contractor, through a subcontractor or otherwise, and, further, if CONTRACTOR shall defend, indemnify and hold harmless OWNER from all such claims, demands or suits by any such person or entity, then this obligation shall be void; otherwise, it shall remain in full force and effect.

Any conditions legally required to be included in a Payment Bond on this Contract, including but not limited to those set out in §107.170 RSMo. are included herein by reference.

SURETY agrees that, in the event that CONTRACTOR fails to make payment of the obligations covered by this Bond, it will do so and, further, that within forty-five (45) days of receiving, at the address given below, a claim hereunder stating the amount claimed and the basis for the claim in reasonable detail, it (a) will send an answer to the claimant, with a copy to OWNER stating the amounts that are undisputed and the basis for challenging any amounts that are disputed, and (b) will pay any amounts that are undisputed. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

While this Bond is in force, it may be sued on at the instance of any party to whom any such payment is due, in the name of OWNER to the use for such party. OWNER shall not be liable for the payment of any costs or expenses of any such suit.

No suit shall be commenced or pursued hereunder other than in a state court of competent jurisdiction in Jackson, Clay or Platte County, Missouri, or in the United States District Court for the Western District of Missouri.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

**CONTRACTOR**

Name, address and facsimile number of Contractor

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: \_\_\_\_\_  
Title: \_\_\_\_\_

(Attach corporate seal if applicable)

**SURETY**

Name, address and facsimile number of Surety:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A- or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and(4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

(Attach seal and Power of Attorney)



# PERFORMANCE BOND

Project/Contract Number: 80001977/9618

Project Title: 3.0 Million Gallon Elevated Storage Tanks

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_, as PRINCIPAL (CONTRACTOR), and \_\_\_\_\_, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a Contract with OWNER for \_\_\_\_\_ which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract including all duly authorized changes thereto, according to all the terms thereof, including those under which CONTRACTOR agrees to pay legally required wage rates including the prevailing hourly rate of wages in the locality, as determined by the Department of Labor and Industrial Relations or by final judicial determination, for each craft or type of workman required to execute the Contract and, further, shall defend, indemnify, and hold harmless OWNER from all damages, including but not limited to liquidated damages, loss and expense occasioned by any failure whatsoever of said CONTRACTOR and SURETY to fully comply with and carry out each and every requirement of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

**CONTRACTOR**

Name, address and facsimile number of Contractor

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: \_\_\_\_\_  
Title: \_\_\_\_\_

(Attach corporate seal if applicable)

**SURETY**

Name, address and facsimile number of Surety:

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I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A- or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Reinsuring Companies: as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By: \_\_\_\_\_

Title: \_\_\_\_\_

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

(Attach seal and Power of Attorney)



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER AGENT NAME AND ADDRESS	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
INSURED CONTRACTOR NAME AND ADDRESS	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	INSURER A : ABC INSURANCE COMPANY	
	INSURER B :	
	INSURER C :	
	INSURER D :	
INSURER E :		
INSURER F :		
		NAIC #

**COVERAGES****CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC	Y	Y	POLICY NUMBER	1/1/2011	Current	EACH OCCURRENCE	\$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 50,000
							MED EXP (Any one person)	\$ 10,000
							PERSONAL & ADV INJURY	\$ 1,000,000
							GENERAL AGGREGATE	\$ 2,000,000
							PRODUCTS - COMP/OP AGG	\$ 2,000,000
								\$
A	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS NON-OWNED AUTOS	Y	Y	POLICY NUMBER	1/1/2011	Current	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
								\$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> EXCESS LIAB <input checked="" type="checkbox"/> RETENTION \$ 10,000	Y	Y	POLICY NUMBER	1/1/2011	Current	EACH OCCURRENCE	\$ 2,000,000
							AGGREGATE	\$ 2,000,000
								\$
A	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	Y	POLICY NUMBER	1/1/2011	Current	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER
							E.L. EACH ACCIDENT	\$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	\$ 1,000,000
A	Leased/Rented/Equip. Owned Equipment Builders Risk/Installation Floater	N/A	Y	POLICY NUMBER	1/1/2011	Current	Limit; Deductible	Limit; Deductible
							Limit; Deductible	Limit; Deductible

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Project No. \_\_\_\_\_ [Title]. Certholder (City) and \_\_\_\_\_ (Design Professional) and any other entities named in 00800 SCs are named as primary, noncontributing Additional Insureds including products and completed operations, excluding workers compensation, employers liability and professional liability. Waiver of subrogation applies as allowed by law. [The policies required above shall contain no exclusions for work expressly within the subcontractors scope of work.]

**CERTIFICATE HOLDER****CANCELLATION**

City of Kansas City, Missouri _____ [Department] _____ [Address] Kansas City, MO _____ [Zip]	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE
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# AUTHORIZATION TO RELEASE A REVENUE CLEARANCE LETTER

Revenue Division  
414 East 12<sup>th</sup> Street, 2<sup>nd</sup> floor, Room 202 W  
Kansas City, MO 64106 Phone (816) 513-1135 Fax (816) 513-1077 email: revenue@kcmo.org

I authorize the City of Kansas City, Missouri, Finance Department, Revenue Division, to release a Revenue Clearance Letter for:

Name of Taxpayer: \_\_\_\_\_ Tax I.D.# \_\_\_\_\_  
*(PRINT)*

Address: \_\_\_\_\_

**Check this box and the City will send the Clearance Letter to you or the contractor designated.**

I authorize the City to provide a copy of the Taxpayer's Revenue Clearance Letter to the following:

NAME <i>(PRINT)</i>	BUSINESS NAME	TITLE
ADDRESS	CITY, STATE, ZIP CODE	
PHONE NUMBER	FAX NUMBER	E-MAIL ADDRESS

I authorize the City to provide the Taxpayer's Revenue Clearance Letter to all City Departments and to publish on the City's internet/intranet website that the Taxpayer is in compliance with the tax ordinances administered by the City's Commissioner of Revenue.

Please send my 1<sup>st</sup> Revenue Clearance Letter to: \_\_\_\_\_  
*(Print Name of City Department/Contact Person/E-mail/Fax Number)*

This authorization shall expire one (1) year from the date of the signature.

The City, Commissioner of Revenue and the Revenue Division personnel (hereinafter "the City"), are hereby held harmless from any and all liability relating to unauthorized disclosure of confidential tax information resulting from release of information under all applicable confidentiality laws including federal, state, or local including any damages sustained by wrongful transmission of confidential tax information to any other person.

UNDER PENALTIES OF PERJURY, I DECLARE THAT I HAVE EXAMINED THIS AUTHORIZATION, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT IS TRUE, CORRECT AND COMPLETE.

**I hereby certify that I am the Taxpayer named herein or that I have the authority to execute this authorization and hold harmless agreement on behalf of the Taxpayer.**

NAME <i>(PRINT)</i>	TITLE <i>(IF APPLICABLE)</i>	
SIGNATURE	PHONE NUMBER	DATE

**A FACSIMILE OF THIS DOCUMENT SHALL CONSTITUTE AN ORIGINAL**



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## ARTICLE 1 DEFINITIONS AND TERMINOLOGY

### 1.01 Defined Terms

A. Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

**1. Addenda** - Written or graphic instruments issued prior to the opening of Bids that clarify, correct or change the Bidding Requirements or the Contract Documents.

**2. Agreement**—The written Contract between CITY and CONTRACTOR governing the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

**3. Application for Payment**—The form accepted by CITY's Representative which is to be used by CONTRACTOR in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

**4. Asbestos** - Any material that contains more than one percent (1%) Asbestos and is friable or is releasing Asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

**5. Bid**- The offer or proposal of the Bidder submitted on the Bid Form/Contract setting forth the prices for the Work to be performed. A Bidder's Bid becomes a Contract with CITY if the CITY executes the Bid Form/Contract submitted by Bidder. If the CITY executes the Bid Form/Contract submitted by Bidder, the term "Bidder" shall mean CONTRACTOR.

**6. Bidder**- One who submits a Bid directly to CITY, as distinct from a sub-bidder who submits a bid to a Bidder. If the CITY executes the Bid Form/Contract submitted by Bidder, the term "Bidder" shall mean CONTRACTOR in both the Bidding Documents and Contract Documents unless the context clearly indicates otherwise.

**7. Bidding Documents**- The advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form/Contract, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

**8. Bidding Requirements**- The advertisement or invitation to bid, Instructions to Bidders, Bid security, and the Bid Form/Contract with any supplements.

**9. Bonds**- Payment Bond and Performance and Maintenance Bond and other instruments of security.

**10. Calendar Day**- Any day shown on the calendar, including Saturdays, Sundays, and holidays.

**11. Change Order**- A written document issued by CITY that authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Contract.

**12. CITY/OWNER**- Kansas City, Missouri, a constitutionally chartered municipal corporation, with which CONTRACTOR has entered into the Contract and for whom the Work is to be provided.

**13. CITY's Representative**- Person or agency designated to act for the Director as provided in these Contract Documents.

**14. Consultant**- Person, firm or corporation having a contract with CITY or DESIGN PROFESSIONAL to furnish services as an independent professional associate or Consultant with respect to the Project and who's identified as such in the Supplementary Conditions.

The Consultant(s) is identified and their seals affixed on the Certification Page(s). The certifications describe the respective responsibilities for the Drawings and Specifications prepared by the Consultant(s) and are incorporated into this Contract.

**15. Contract-** The entire and integrated written agreement between CITY and CONTRACTOR concerning the Work that incorporates all Contract Documents. The Bid Form/Contract submitted by Bidder is the Contract between CITY and CONTRACTOR upon execution by CITY. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

**16. Contract Documents-** The Contract Documents establish the rights and obligations of the parties and include the Contract, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid Form/Contract (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Intent to Contract), the HRD Construction Project Instructions, the Contractor's Utilization Plan/Request for Waiver, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Project Manual and the certification page(s) of the DESIGN PROFESSIONAL and Consultant(s), together with approved project baseline schedule and amendments thereto and all Written Amendments, Change Orders, Work Change Directives, and DESIGN PROFESSIONAL's written interpretations and clarifications issued on or after the Effective Date of the Contract, and approved Shop Drawings. Reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this Paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by CITY to CONTRACTOR are not Contract Documents, except project schedules submitted by CONTRACTOR and approved by CITY.

**17. Contract Price-** The money payable by CITY to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement.

**18. Contract Times-** The number of days or the dates stated in the Supplementary Conditions: (a) to achieve Substantial Completion, and (b) to complete the Work so that it is ready for final payment as evidenced by CITY's Representative's written recommendation of final payment.

**19. CONTRACTOR-** The person, firm, partnership, company, corporation or association licensed or otherwise authorized by law to do business in Missouri, with whom CITY has entered into the Agreement.

**20. Day-** Shall constitute a Calendar Day.

**21. DESIGN PROFESSIONAL-** Architect, Engineer or other licensed professional who is either employed by or has contracted with CITY to serve in a design capacity and whose Consultants, members, partners, employees or agents have prepared and sealed the Drawings and Specifications.

The DESIGN PROFESSIONAL(s) is identified and their seals affixed on the Certification Page(s). The certifications describe the respective responsibilities for the Drawings and Specifications prepared by the DESIGN PROFESSIONAL and are incorporated into this Contract.

**22. DESIGN PROFESSIONAL's Project Representative-** The authorized representative of DESIGN PROFESSIONAL who may be assigned to the Site or any part thereof.

**23. Director-** The term Director shall mean the duly appointed executive officer of a department of City who is empowered by the City Charter or by the City Council to enter into a contract on behalf of City, or to grant a permit for improvements to land owned by City. A Director is authorized to delegate this authority to a City employee so designated in writing.

**24. Drawings-** The drawings which graphically show the scope, extent and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared

by DESIGN PROFESSIONAL and are included in the Contract Documents. Shop Drawings are not Drawings as so defined.

**25. Effective Date of the Contract-** The date indicated in the Contract on which it becomes effective, but if no such date is indicated it means the date on which the Contract is fully executed by CITY.

**26. General Requirements-** Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

**27. Hazardous Environmental Condition-** The presence at the Site of Asbestos, Lead-Based Paint, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

**28. Hazardous Waste-** The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

**29. Laws or Regulations-** Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

**30. Lead-Based Paint-** Any paint, varnish, stain, or other applied coating that has one (1) mg or more of lead per square centimeter. The terms "leaded paint" and "lead-containing paint" are synonymous with Lead-Based Paint.

**31. Liens-** Liens, charges, security interests or encumbrances upon real property or personal property.

**32. Milestone-** A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

**33. Notice of Intent to Contract-** The written notice by CITY to the apparent successful Bidder stating that upon compliance by that apparent successful Bidder with the conditions in the Bid Documents enumerated, within the time specified, and upon enactment of an appropriate ordinance or resolution, CITY will sign and deliver the Contract.

**34. Notice to Proceed-** A written notice given by CITY to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.

**35. Partial Utilization-** Use by CITY of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

**36. PCBs-** Polychlorinated biphenyls.

**37. Petroleum-** Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

**38. Project-** The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

**39. Project Manual-** The documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual may be issued in one or more volumes and is contained in the table(s) of contents.

**40. Radioactive Material-** Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

**41. Samples-** Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

**42. Shop Drawings-** All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

**43. Site-** Lands or areas indicated in the Contract Documents as being furnished by CITY upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by CITY which are designated for the use of CONTRACTOR.

**44. Specifications-** Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

**45. Subcontractor-** Any individual, firm, partnership, company, corporation or association licensed or otherwise authorized by law to do business in Missouri, to whom CONTRACTOR, with written notification to CITY, has entered into an agreement to perform a part of the Work.

**46. Substantial Completion-** When Work (or a specified part thereof) has progressed to the point where, in the opinion of DESIGN PROFESSIONAL as evidenced by DESIGN PROFESSIONAL's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

**47. Supplementary Conditions-** The part of the Contract Documents which amends and/or supplements these General Conditions.

**48. Supplier-** A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated into the Work by CONTRACTOR or any Subcontractor.

**49. Underground Facilities-** All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

**50. Unit Price Work-** Work to be paid for on the basis of unit prices.

**51. Work-** The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor, and furnishing and incorporating material and equipment into the construction, and furnishing documents, all as required by the Contract Documents.

**52. Work Change Directive-** A written directive to CONTRACTOR, issued on or after the Effective Date of the Contract, signed by CITY and recommended by DESIGN PROFESSIONAL, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed, or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

**53. Work Day -** Any day during which the CONTRACTOR is able to work a period of six (6) hours or more. Days that are not Work Days are days during which the CONTRACTOR is

unable to work for a period of six (6) hours by reason of strikes, boycotts, labor disputes, embargoes, unusual delays in transportation or shortage of material, acts of God, acts of the public enemy, acts of superior governmental authority, weather conditions, riots, rebellion, sabotage, or any other circumstances for which CONTRACTOR is not responsible or which is not within its control. Saturdays, Sundays, and holidays on which the CONTRACTOR's forces engage in Work requiring the presence of an inspector, will be considered as Work Days.

**54. Written Amendment-** A written statement modifying the Contract Documents, signed by CITY and CONTRACTOR on or after the Effective Date of the Contract and normally dealing with the non-engineering or non-technical rather than strictly construction-related aspects of the Contract Documents.

## **1.02 Terminology**

### **A. Intent of Certain Terms or Adjectives**

1. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of DESIGN PROFESSIONAL as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to DESIGN PROFESSIONAL any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.08 or any other provision of the Contract Documents.

### **B. Defective**

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to CITY's Representative's recommendation of final payment (unless responsibility for the protection thereof has been assumed by CITY at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

### **C. Furnish, Install, Perform, Provide**

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.

**D.** Unless stated otherwise in the Contract Documents, words and phrases which have a well-known technical or construction industry or trade meanings are used in the Contract Documents in accordance with such recognized meaning.

## ARTICLE 2 PRELIMINARY MATTERS

### 2.01 Delivery of Bonds

A. CONTRACTOR shall deliver to CITY such Bonds as CONTRACTOR may be required to furnish.

### 2.02 Evidence of Insurance

A. CONTRACTOR shall deliver to CITY certificates of insurance or other evidence of insurance that CITY may request, which CONTRACTOR is required to purchase and maintain in accordance with Article 5 or any other applicable provision in the Contract Documents.

### 2.03 Copies of Documents

A. CITY shall furnish to CONTRACTOR one (1) copy of the Drawings and Specifications, including addenda.

### 2.04 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the date indicated in the Notice to Proceed.

### 2.05 Starting the Work

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the Site prior to the date on which the Contract Times commence to run, unless otherwise indicated in the Notice to Proceed.

### 2.06 Before Starting Construction

A. CONTRACTOR's Review of Contract Documents: Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to DESIGN PROFESSIONAL any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from DESIGN PROFESSIONAL before proceeding with any Work affected thereby. CONTRACTOR shall not be liable to CITY or DESIGN PROFESSIONAL for failure to report any conflict, error, ambiguity or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

B. Preliminary Schedules: Within ten (10) days after the Effective Date of the Contract, or on such later date as CITY's Representative shall provide in writing, CONTRACTOR shall submit to CITY's Representative for review:

1. Preliminary Project Schedule: CONTRACTOR shall submit a proposed project schedule for CITY's acceptance. The proposed project schedule shall include a detailed and comprehensive construction schedule utilizing a critical path method diagram network that (a) shows all major procurement and construction elements and phases of the Project; (b) breaks down each element or phase by trade; (c) shows early and late starts so that all float time will be accurately identified; (d) all other activities necessary for the timely completion of the Project in accordance with the scheduled dates for Substantial and Final Completion; and (e) highlights the project's critical path. CITY's acceptance is expressly limited to CITY's acknowledgement that, based upon CITY's limited review, the dates of Substantial Completion and Milestone dates are acceptable. After final acceptance of the preliminary project schedule by the CITY, it shall be considered the project baseline schedule pursuant to Paragraph 2.07(B).

2. Preliminary schedule of Shop Drawings and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal; and

3. Preliminary 01290.02 Schedule of Values for all of the Work which will include quantities and prices of items which when added together equals the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

**C.** Preconstruction Conference: Before any Work at the Site may be started, a conference attended by CONTRACTOR, DESIGN PROFESSIONAL and others, as appropriate, will be scheduled by CITY's Representative to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.06 B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, maintaining required records, Claims process, dispute resolution or any other applicable provisions of the Contract Documents.

## **2.07 Acceptable Schedules**

**A.** Acceptable schedule: The Contractor shall update and submit to the CITY for review the preliminary schedule within seven (7) Calendar Days after the Notice to Proceed.

1. The CITY shall review and make any necessary comments and/or adjustments to the updated preliminary schedule. The Contractor shall incorporate the CITY's comments and resubmit the updated preliminary schedule within seven (7) Calendar Days from receipt of the CITY's comments.

**B.** Project Baseline Schedule: The accepted updated preliminary schedule shall be considered the project baseline schedule and shall be used by the CONTRACTOR for planning, scheduling, managing, and executing the Work. The project baseline schedule shall not be changed without the written consent of CITY. The project baseline schedule may be further modified by the Supplemental Conditions.

**C.** CONTRACTOR's schedule of values will be acceptable to CITY's Representative as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

## **ARTICLE 3 CONTRACT DOCUMENTS : INTENT, AMENDING, REUSE**

### **3.01 Intent**

**A.** The Contract Documents comprise the entire Contract between CITY and CONTRACTOR concerning the Work.

**B.** It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for at no additional cost to CITY. Clarifications and interpretations of the Contract Documents shall be issued by DESIGN PROFESSIONAL as provided in Paragraph 9.03.

**C.** Correlation and intent of documents: The Drawings and Specifications are intended to supplement each other. Any Work shown on the Drawings and not mentioned in the Specifications (or vice versa) shall be as binding and shall be completed the same as if mentioned or shown on both. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. Change Orders and Written Amendments
2. Project Baseline Schedule Requirements
3. Approved Shop Drawings
4. Addenda, with those of later date having precedence over those of earlier date

5. The Supplementary Conditions
6. The General Conditions
7. Drawings and Specifications

**D.** In the case of an inconsistency between Drawings and Specifications, the requirements of the Specifications shall govern. If Drawings are in conflict, larger scale details shall govern over smaller or no-scale Drawings. If Specification sections are in conflict with each other, the conflict shall be resolved by DESIGN PROFESSIONAL in accordance with reasonable interpretation of such documents.

**E.** The general character of the detailed Work is shown on the Drawings, but minor modifications may be made in the full size or scale details. Where the word “similar” occurs on the Drawings, it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to the other parts of the Work. Where on any Drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the Work. Where ornaments or other details are indicated by starting only, such details shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts in the Work, unless otherwise indicated.

### **3.02 Reference to Standards and Specifications of Technical Societies**

**A.** Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or on the date of CONTRACTOR’s proposal if there are no Bids), except as may be otherwise specifically stated in the Contract Documents.

1. No provision of any such standard, specification, manual, code or instruction of Supplier shall be effective to change the duties or responsibilities of CITY, CONTRACTOR or DESIGN PROFESSIONAL, or any of their Subcontractors, Consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to CITY or DESIGN PROFESSIONAL or any of their Consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### **3.03 Reporting and Resolving Discrepancies**

**A. Reporting Discrepancies:** If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Laws or Regulations applicable to the performance of the Work or of any standard, specification, manual, code or any instruction of any Supplier referred to in Paragraph 6.07, CONTRACTOR shall report it immediately to DESIGN PROFESSIONAL in writing. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as authorized by Paragraph 6.17) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to CITY or DESIGN PROFESSIONAL for failure to report any such conflict, error, ambiguity or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

**B. Resolving Discrepancies.** The provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

1. the provisions of any standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
2. the provisions of any Laws or Regulations applicable to the performance of the Work.

### **3.04 Amending and Supplementing Contract Documents**

**A.** The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

1. a Written Amendment or
2. a Change Order (pursuant to Article 10), whether pursuant to a Work Change Directive or otherwise.

**B.** The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized, in one or more of the following ways

1. DESIGN PROFESSIONAL's approval of a Shop Drawing or Sample (pursuant to Paragraph 6.18), or
2. DESIGN PROFESSIONAL's written interpretation or clarification (pursuant to Paragraph 9.03).

### **3.05 Reuse of Documents**

**A.** CONTRACTOR and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under this Contract:

1. shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of DESIGN PROFESSIONAL or Consultant, and
2. shall not reuse any of such Drawings, Specifications, other documents or copies thereof on extensions of the Project or any other project without written consent of CITY, and of DESIGN PROFESSIONAL or Consultant, as applicable, and specific written verification or adaptation by DESIGN PROFESSIONAL or Consultant.

This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS**

### **4.01 Availability of Lands**

**A.** CITY shall furnish the Site. CITY shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which CONTRACTOR will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by CITY, unless otherwise provided in the Contract Documents. If CONTRACTOR and CITY are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times or both as a result of any delay in CITY's furnishing these lands, rights-of-way or easements, CONTRACTOR may make a Claim as provided in Article 16. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

### **4.02 Subsurface and Physical Conditions**

**A. Reports and Drawings:** Reference is made to the Supplementary Conditions for identification of:

1. Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by DESIGN PROFESSIONAL in preparing the Contract Documents; and

2. Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that have been utilized by DESIGN PROFESSIONAL in preparing the Contract Documents.

**B. Limited Reliance by CONTRACTOR on Technical Data Authorized:** CONTRACTOR may rely upon the general accuracy of the technical data contained in reports and drawings of subsurface or physical conditions, but such reports and drawings are not Contract Documents. The technical data is identified in the Supplementary Conditions. Except for reliance on such technical data, CONTRACTOR may not rely upon or make any Claim against CITY, DESIGN PROFESSIONAL or any Consultant with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or

3. any CONTRACTOR interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions or information.

#### **4.03 Differing Subsurface or Physical Conditions**

**A. Notice of Differing Subsurface or Physical Conditions.** If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any technical data on which CONTRACTOR is entitled to rely as provided in Paragraphs 4.02 A and 4.02 B is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.17), notify CITY and DESIGN PROFESSIONAL in writing about such condition(s). CONTRACTOR shall not further disturb such conditions or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

**B. DESIGN PROFESSIONAL's Review:** After receipt of notice as required by Paragraph 4.03 A, DESIGN PROFESSIONAL will promptly review the pertinent conditions, determine the necessity for CITY to obtain additional exploration or tests with respect thereto and notify CITY in writing (with a copy to CONTRACTOR) of DESIGN PROFESSIONAL's findings and conclusions.

**C. Possible Contract Documents Change:** If CITY concludes that a change in the Contract Documents is required as a result of a condition that meets one or more of the categories in Paragraph 4.03 A, a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

**D. Possible Price or Times Adjustments:** An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of a subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

1. the condition must meet any one or more of the categories described in Paragraphs 4.03 A.1 through 4.03 A.4, inclusive;

2. a change in the Contract Documents pursuant to Paragraph 4.03 C will not be an automatic authorization of, nor a condition precedent to, entitlement to any such adjustments;
3. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.06 and 11.04; and
4. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if;
  - a. CONTRACTOR knew, or by the exercise of ordinary care could have known, of such conditions at the time CONTRACTOR made a final commitment to CITY with respect to Contract Price and Contract Times by the submission of a Bid; or
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or
  - c. CONTRACTOR failed to give the written notice as required by Paragraph 4.03 A.

**E.** If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price pursuant to Article 11 and/or Contract Times pursuant to Article 12, a Claim may be made therefore as provided in Article 16. However, CITY, DESIGN PROFESSIONAL and Consultants shall not be liable to CONTRACTOR for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

#### **4.04. Physical Conditions – Underground Facilities**

**A. Shown or Indicated:** The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to CITY or DESIGN PROFESSIONAL by the owners of such Underground Facilities or by others.

1. CITY and DESIGN PROFESSIONAL shall not be responsible for the accuracy or completeness of any such information or data; and
2. The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for:
  - a. reviewing and checking all such information and data,
  - b. locating all Underground Facilities shown or indicated in the Contract Documents,
  - c. coordination of the Work with the owners of such Underground Facilities during construction, and
  - d. the safety and protection of all such Underground Facilities as provided in Paragraph 6.14 and repairing any damage thereto resulting from the Work.

**B. Not Shown or Indicated:** If an Underground Facility is uncovered or revealed at or contiguous to the Site, and was not shown or indicated in the Contract Documents, or was shown or indicated incorrectly in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.17), identify the owner of such Underground Facility and give written notice to that owner and to CITY and DESIGN PROFESSIONAL.

**C. DESIGN PROFESSIONAL's Review:** After receipt of notice as required by Paragraph 4.04 B, DESIGN PROFESSIONAL will promptly review the consequences of the existence of the Underground Facility and notify CITY in writing (with a copy to CONTRACTOR) of DESIGN PROFESSIONAL's findings and conclusions.

**D. Possible Contract Documents Change:** If CITY concludes that a change in the Contract Documents is required as a result of the existence of an Underground Facility that either was not shown, or was shown incorrectly, in the Contract Documents, a Work Change Directive or Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

**E. Possible Price or Times Adjustments:** An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of the Underground Facility causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

1. a change in the Contract documents pursuant to Paragraph 4.04 D will not be an automatic authorization of, nor a condition precedent to, entitlement to any such adjustments;
2. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.06 and 11.04; and
3. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if;
  - a. CONTRACTOR knew, or by the exercise of ordinary care could have known, of the existence of the Underground Facility at the time CONTRACTOR made a final commitment to CITY with respect to Contract Price and Contract Times by the submission of a Bid; or
  - b. the existence of the Underground Facility could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or
  - c. CONTRACTOR failed to give the written notice as required by Paragraph 4.04 B.

**F.** If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price pursuant to Article 11 and/or Contract Times pursuant to Article 12, a Claim may be made therefore as provided in Article 16. However, CITY, DESIGN PROFESSIONAL and Consultants shall not be liable to CONTRACTOR for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

#### **4.05 Reference Points**

**A.** CITY shall provide engineering surveys to establish reference points for construction that in DESIGN PROFESSIONAL's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of CITY. CONTRACTOR shall report to DESIGN PROFESSIONAL whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

#### **4.06 Asbestos, Lead-Based Paint, PCBs, Petroleum, Hazardous Waste or Radioactive Material**

**A. Reports and Drawings:** Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the DESIGN PROFESSIONAL in the preparation of the Contract Documents.

**B. Limited Reliance by CONTRACTOR on Technical Data Authorized:** CONTRACTOR may rely upon the general accuracy of the technical data contained in reports and drawings relating to a Hazardous Environmental Condition at the Site, but such reports and drawings are not Contract Documents. Such technical data is identified in the Supplementary Conditions. Except for such reliance on such technical data, CONTRACTOR may not rely upon or make any Claim against CITY, DESIGN PROFESSIONAL or any Consultant with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions or information.

**C.** CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for all Hazardous Environmental Conditions created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible. CONTRACTOR shall not be entitled to an extension of the Contract Times or an increase in the Contract Price if CONTRACTOR, Subcontractor, Supplier or anyone for whom CONTRACTOR is responsible created any Hazardous Environmental Condition at the Site or in connection with the Work.

**D.** If CONTRACTOR encounters a Hazardous Environmental Condition at the Site or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition at the Site, CONTRACTOR shall immediately:

1. secure or otherwise isolate such condition;
2. stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6. 15); and
3. notify CITY and DESIGN PROFESSIONAL (and promptly thereafter confirm such notice in writing). CITY shall promptly consult with DESIGN PROFESSIONAL concerning the necessity for CITY to retain a qualified expert to evaluate such condition or take corrective action, if any.

**E.** CONTRACTOR shall neither resume Work nor be required to resume Work in connection with such condition or in any affected area until after CITY has obtained any required permits related thereto and delivered to CONTRACTOR written notice:

1. specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or
2. specifying any special conditions under which such Work may be resumed safely. If CITY and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price pursuant to Article 11 and/or Contract Times to pursuant to Article 12 as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, a Claim may be made therefore as provided in Article 16.

**F.** If after receipt of written notice as required in Paragraph 4.06 E, CONTRACTOR does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under special conditions specified in the notice, then CITY may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If CITY and CONTRACTOR cannot agree as to entitlement to or magnitude of an equitable adjustment in Contract Price pursuant to Article 11 and/or Contract Times pursuant to Article 12 as a result of

deleting such portion of the Work, then a Claim may be made therefore as provided in Article 16. CITY may have such deleted portion of the Work performed by CITY's own forces or others in accordance with Article 7.

**G.** The provisions of Paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

**H.** All materials used, whether new or salvaged, shall be asbestos-free materials. CONTRACTOR shall immediately call to the attention of the CITY's Representative any specified material or product which the CONTRACTOR knows or suspects to contain asbestos, whether new or salvaged.

## **ARTICLE 5 BONDS AND INSURANCE**

### **5.01 Performance, Payment and Other Bonds**

**A.** CONTRACTOR shall furnish Performance and Maintenance and Payment Bonds, each in an amount at least equal to the Contract Price, as set out in the Contract Documents, as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one (1) year after the date when final payment of the Contract becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions.

**B.** All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations. A certified copy of the agent's authority to act must accompany all Bonds signed by an agent.

**C.** If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirement of Paragraph 5.01 B, CONTRACTOR shall within twenty (20) days thereafter substitute another Bond and surety, both of which must be acceptable to CITY.

### **5.02 Licensed Sureties and Insurers**

**A.** All Bonds and insurance required by the Contract Documents to be purchased and maintained by CITY or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed in the State of Missouri and in the jurisdiction in which the Project is located, if not in Missouri, to issue Bonds or insurance policies for the limits and coverages so required. All surety and insurance companies shall hold an A.M. Best rating of A-, V, or better.

### **5.03 Certificates of Insurance**

**A.** CONTRACTOR shall deliver to CITY and DESIGN PROFESSIONAL, prior to the start of any Work at the Project Site, properly completed certificates of insurance or other evidence that the required insurance is in full force and effect, in a form acceptable to CITY. The receipt or acceptance of a certificate of insurance that does not incorporate the required terms and coverage shall not constitute a waiver by the City of the insurance requirements contained in the Contract Documents.

**B.** All policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained by CONTRACTOR in accordance with Paragraphs 5.04 and 5.06 will contain waiver provisions in accordance with Paragraph 5.07 A. The certificates of insurance will contain a provision stating that should any of the policies described in the certificate be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

**C.** If the coverage afforded is cancelled or changed or its renewal is refused, CONTRACTOR shall give at least thirty (30) days prior written notice to CITY and to each other additional insured to whom a certificate of insurance has been issued.

#### **5.04 CONTRACTOR's Liability Insurance**

**A.** CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and furnished, and will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;
4. claims for damages insured by customary personal injury liability coverage;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefore; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

**B.** The policies of insurance so required by Paragraph 5.04 A, to be purchased and maintained shall:

1. with respect to insurance required by Paragraphs 5.04 A.3 through 5.04 A.5 inclusive, include as additional insureds (subject to any customary exclusion for professional liability) CITY, DESIGN PROFESSIONAL, Consultants and any other individuals or entities identified in the Supplementary Conditions to be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in Paragraph 5.04 C or required by Laws or Regulations, whichever is greater;
3. include completed operations insurance;
4. include contractual liability insurance covering CONTRACTOR's indemnity obligations;
5. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing defective Work in accordance with Paragraphs 13.06 and 13.07;
6. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two (2) years after final payment (and CONTRACTOR shall furnish CITY and each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued evidence satisfactory to CITY and any such additional insured of continuation of such insurance);
7. contain a cross-liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance;
8. with respect to commercial automobile liability, commercial general liability, and umbrella liability insurance, CONTRACTOR shall require its insurance carrier(s) to waive all

rights of subrogation against CITY, and CITY's officers, directors, partners, employees and agents; and

9. contain a provision or endorsement that the costs of providing the insureds a defense and appeal, including attorneys' fees, as insureds, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's responsibility.

**C.** Specific policies of insurance required by this Paragraph 5.04 shall include:

1. Workers' Compensation and Employers' Liability Insurance. This insurance shall protect CONTRACTOR against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of workers' compensation laws. This policy shall include an "all states" or "other states" endorsement. The liability limits shall be not less than:

Workers' Compensation: Statutory

Employers' liability: \$1,000,000 each occurrence

2. Commercial Automobile Liability Insurance. This insurance shall be occurrence type written in comprehensive form and shall protect CONTRACTOR, and CITY, DESIGN PROFESSIONAL and Consultants against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the Project Site, whether they are owned, non-owned, or hired.

The liability limits shall be not less than: \$2,000,000

3. Commercial General Liability Insurance. This insurance shall be occurrence type written in comprehensive form acceptable to CITY. This insurance shall protect CONTRACTOR, and CITY, DESIGN PROFESSIONAL and Consultants as additional insureds, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The policy shall also include coverage for personal injury liability; contractual liability; completed operations and products liability; and for blasting, explosion, and collapse of buildings; and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

\$2,000,000 combined single limit for each occurrence

\$2,000,000 general aggregate.

4. The insurer's costs of providing the insureds a defense and appeal as additional insureds, including attorney's fees, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's separate responsibility.

## **5.05 CITY's Liability Insurance**

**A.** In addition to the insurance required to be provided by CONTRACTOR under Paragraph 5.04, CITY, at CITY's option, may purchase and maintain at CITY's expense liability insurance that will protect CITY against claims which may arise from operations under the Contract Documents.

## **5.06 Property Insurance**

**A.** Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain property insurance on the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws or Regulations). This insurance shall:

1. include the interests of CITY, CONTRACTOR, Subcontractors, and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, tornado, collapse, debris removal, demolition occasioned by enforcement of Laws or Regulations, water damage, damage caused by frost and freezing, and acts of God;

3. be maintained in effect until final payment is made unless otherwise agreed to in writing by CITY with thirty (30) days written notice to each other additional insured to whom a certificate of insurance has been issued.

**B.** CITY shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others involved in the Work to the extent of any deductible amounts. The risk of loss within the deductible amounts will be borne by CONTRACTOR, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

### **5.07 Waiver of Rights**

**A.** CITY and CONTRACTOR intend that all policies purchased in accordance with Paragraphs 5.04 and 5.06 will protect CITY, CONTRACTOR, DESIGN PROFESSIONAL Consultants, Subcontractors, and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds in such policies and will provide primary coverage for all losses and damages caused by the perils covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. CITY and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees and agents for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work, but only to the extent of insurance coverage; and, in addition, waive all such rights against DESIGN PROFESSIONAL, Consultants, Subcontractors, and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of any and each of them) under such policies for losses and damages so caused and covered by insurance. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by CITY as trustee or otherwise payable under any policy so issued. None of the above waivers shall apply if specifically in conflict with Laws and Regulations.

### **5.08 Receipt and Application of Insurance Proceeds**

**A.** Any insured loss under the property insurance will be adjusted with CITY and made payable to CITY as fiduciary for the insureds, as their interests may appear, subject to the requirements of any indentures of indebtedness entered into by CITY.

**B.** CITY as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object to CITY's exercise of this power in writing within fifteen (15) days after the occurrence of loss. If such objection is made, CITY as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, CITY as fiduciary shall adjust and settle the loss with the insurers.

### **5.09 Partial Utilization – Property Insurance**

**A.** If CITY finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with Paragraph 14.05; provided that no such use or occupancy shall commence

before the insurers providing the property insurance have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

## **ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES**

### **6.01 Indemnification**

**A.** For purposes of this Paragraph 6.01 only, the following terms shall have the meanings listed:

1. Claims means all claims, damages, liability, losses, costs and expenses, including court costs and reasonable attorneys' fees, including attorney's fees incurred by the City in the enforcement of this indemnity obligation.

2. CONTRACTOR'S Agents means CONTRACTOR's officers, employees, sub-consultants, subcontractors, successors, assigns, invitees, and other agents.

3. CITY means CITY, its Program Manager/Construction Advisor and any of their agents, officials, officers, employees and program managers or construction advisors.

**B.** CONTRACTOR's obligations under this Paragraph with respect to indemnification for acts or omissions, including negligence, of CITY, shall be limited to the coverage and limits of insurance that CONTRACTOR is required to procure and maintain under this Contract. CONTRACTOR affirms that it has had the opportunity to recover the costs of the liability insurance required in this Contract in its contract price.

**C.** CONTRACTOR shall defend, indemnify and hold harmless CITY from and against all Claims arising out of or resulting from all acts or omissions in connection with this Contract caused in whole or in part by CONTRACTOR or CONTRACTOR's Agents, regardless of whether or not caused in part by any act or omission, including negligence, of OWNER.

**D.** In any and all Claims against CITY, DESIGN PROFESSIONAL, CONSULTANT, or any of their respective agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.01 C shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

**E.** The indemnification obligations of CONTRACTOR under Paragraph 6.01 C shall not extend to liability arising out of, resulting from, or caused by the professional negligence, errors or omissions of DESIGN PROFESSIONAL, CONSULTANT, or any of their respective agents, officers, directors or employees.

### **6.02 Supervision and Superintendence**

**A.** CONTRACTOR shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or specification of a specific means, method, technique, sequence or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

**B.** At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent of the Work, who shall not be replaced without written request to and approval by CITY except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

**C.** If it is determined to be in the best interest of the Work, CONTRACTOR shall replace the project manager, resident superintendent or any other employee of the CONTRACTOR, Subcontractors, Suppliers or other persons or organizations performing or furnishing any of the Work on the project upon written request by the CITY.

### **6.03 Services, Working Hours, Labor, Materials and Equipment**

**A.** CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out and construct or perform the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the Site shall be performed during regular working hours. CONTRACTOR shall not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without CITY's written consent given after prior written notice to DESIGN PROFESSIONAL.

**B.** Unless otherwise specified in Division 1, General Requirements, CONTRACTOR shall furnish and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

**C.** All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of CITY. If required by DESIGN PROFESSIONAL, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

**D.** It is the policy of the CITY that any manufactured goods or commodities used or supplied in the performance of this Contract and any subcontract hereto shall be manufactured or produced in the United States whenever possible.

### **6.04 Progress Schedule**

**A.** CONTRACTOR shall adhere to the progress schedule established in accordance with Article 2 as it may be adjusted from time to time as provided below:

1. CONTRACTOR shall provide, at least once every thirty (30) calendar days, updated information on the project schedule, including thirty (30) day look ahead schedules, projected variances per event category and per Subcontractor, identification of all variances and calculation of the number of Days difference between the as-built critical path and the project schedule critical path

2. CONTRACTOR shall, with each application for payment, provide completed monthly updated status report for the previous month on the project schedule and updated information indicating as-built and as-planned conditions. The updated information on the project schedule shall not modify any Milestone dates in the project schedule that CITY has previously approved. The updated information required is a condition precedent to payment pursuant to paragraph 14.02 and shall include at a minimum:

- a. a concise statement of the outlook for meeting project schedule dates and the reasons for any change in outlook from the previous report;
- b. a review of any significant technical problems encountered during the month;
- c. an explanation of any corrective action taken or proposed; and
- d. a summary of any Claims anticipated by CONTRACTOR with respect to the Work, including the anticipated costs and schedule impacts of any such Claims.

## **6.05 Recovery Schedules**

### **A. If the CONTRACTOR should:**

1. fail, refuse or neglect to supply a sufficient number of workers or to deliver the materials or equipment with such promptness as to prevent the delay in the progress of the Work;
2. fail in any respect to commence and diligently prosecute the Work in accordance with the approved baseline project schedule in order to achieve substantial completion;
3. fail to commence, prosecute, finish, deliver or install the different portions of the Work on time as specified in the approved baseline project schedule; or
4. fail in the performance of any of the material covenants of the Contract Documents;

CITY shall have the right to direct the CONTRACTOR, upon seven (7) calendar days notice, to prepare a written recovery plan, for CITY's approval, to accelerate the Work in order to conform to the approved baseline project schedule, including, without limitation, providing additional labor or expediting delivery of materials, performing overtime or re-sequencing the Work without adjustments to the Contract value. Upon CITY's approval of the recovery plan, CONTRACTOR shall accelerate the Work in accordance with the plan.

**B.** Proposed recovery schedules shall be submitted to the CITY as a separate project plan for review and approval by CITY prior to incorporation into the approved baseline schedule. The recovery schedule shall be submitted in a format compatible with the baseline schedule format. Each proposed revision shall be submitted as a separate schedule, with the following minimum requirements:

1. A critical path method diagram showing revised and affected activities or Milestones.
2. An activity report for all revised and affected activities or Milestones.

**C.** Upon acceptance of the recovery schedule by CITY, data shall be added or revised for all new or revised activities and incorporated into the approved baseline project schedule.

## **6.06 Substitutes and "Or-Equal" Items**

**A.** Materials or equipment: Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance and quality required. Unless the specification or description contains, or is followed by, words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to CITY for review by CITY's Representative under the following circumstances:

1. "Or-Equal": If, prior to receipt of Bids, Bidder proposes an item of material or equipment as functionally equal to that named and sufficiently similar so that no change in related Work will be required, CITY's Representative may request DESIGN PROFESSIONAL to consider it as an "or-equal" item. DESIGN PROFESSIONAL will review and recommend the acceptance, or rejection, of the proposed item to the CITY's Representative. For the purposes of this Paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment DESIGN PROFESSIONAL determines that:

(1) it is at least equal in quality, durability, appearance, strength, and design characteristics; and

(2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; and

b. Bidder certifies that:

(1) there is no increase in cost to the CITY; and

(2) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

If the CITY's Representative approves the proposed item, it may be accepted by CITY.

**2. Substitute Items:** If CONTRACTOR proposes an item of material or equipment as a substitute item, then CONTRACTOR shall submit sufficient information as provided below to allow CITY's Representative to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. The procedure for review by the CITY's Representative will include the following as supplemented in the General Requirements and as CITY's Representative may determine is appropriate under the circumstances:

a. Requests for review of proposed substitute items of material or equipment will not be accepted by CITY's Representative from anyone other than CONTRACTOR.

b. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall first make written application to CITY's Representative for acceptance thereof.

c. In the application, CONTRACTOR shall certify that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will impact CONTRACTOR's achievement of Substantial Completion, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with CITY for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.

d. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by CITY's Representative in evaluating the proposed substitute. CITY's Representative may require CONTRACTOR to furnish additional data about the proposed substitute.

If the CITY's Representative approves the proposed item, CITY may accept it.

**B. Substitute Construction Methods or Procedures:** If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to DESIGN PROFESSIONAL. CONTRACTOR shall notify CITY and submit sufficient information to allow DESIGN PROFESSIONAL, in DESIGN PROFESSIONAL's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents.

**C. Expenses:** Bidder shall provide all data in support of any “or equal” at Bidder’s expense, and CONTRACTOR shall provide all data in support of any proposed substitute at CONTRACTOR’s expense.

**D. Evaluation:** DESIGN PROFESSIONAL and CITY’s Representative will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.06 A, and 6.06 B. CITY will be the sole judge of acceptability. No “or-equal” or substitute will be ordered, installed or utilized without CITY’s prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. CITY may require CONTRACTOR to furnish at CONTRACTOR’s expense, a special performance guarantee or other surety with respect to any “or-equal” substitute. DESIGN PROFESSIONAL will record time required by DESIGN PROFESSIONAL and Consultants in evaluating substitutes proposed or submitted by CONTRACTOR pursuant to Paragraphs 6.06 A and 6.06 B and in making changes in the Contract Documents (or in the provisions of any other direct contract with CITY for work on the Project) occasioned thereby. Whether or not CITY accepts a substitute so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse CITY for the reasonable charges of DESIGN PROFESSIONAL and Consultants for evaluating each such proposed substitute.

### **6.07 Concerning Subcontractors, Suppliers and Others**

**A.** CONTRACTOR shall not employ or retain any Subcontractor, Supplier or other person or organization (including those acceptable to CITY as indicated in Paragraph 6.07 B), whether initially or as a substitute, against whom CITY has a reasonable objection, including but not limited to debarment by City or another governmental entity or decertification of the Subcontractor from the City’s Minority and Women’s Business Enterprise Program as a result of the Subcontractor’s failure to comply with any of the requirements of the provisions of Chapter 3 of the City’s Code as determined by the Director of the Human Relations Department. Contractor shall insert this provision in any subcontractor agreement associated with this Contract. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection. CONTRACTOR shall submit required information for all Subcontractors on Form 01290.09 - Subcontractor and Major Material Suppliers List, provided in these Contract Documents, prior to Subcontractor beginning Work at the Site.

**B.** The Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to CITY on or before the date specified in the Supplementary Conditions, for acceptance by CITY. If CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, CITY may accept (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Contract Documents) any such Subcontractor, Supplier or other person or organization so identified, or may reject same on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier or other person or organization. The Contract Price will be adjusted by the difference in the cost occasioned by such substitution, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by CITY of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of CITY or DESIGN PROFESSIONAL to reject defective Work.

**C.** CONTRACTOR shall be fully responsible to CITY for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR’s own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier or other person or organization any contractual relationship between CITY or DESIGN PROFESSIONAL and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of CITY or DESIGN PROFESSIONAL to pay or to see to the payment of any moneys due

any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws or Regulations.

**D.** CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

**E.** CONTRACTOR shall contractually require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with CITY and DESIGN PROFESSIONAL through CONTRACTOR.

**F.** The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

**G.** All Work performed for CONTRACTOR by a Subcontractor or Supplier shall be pursuant to an appropriate written agreement between CONTRACTOR and the Subcontractor or Supplier that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of CITY. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against CITY, CONTRACTOR, DESIGN PROFESSIONAL, Consultants and all other additional insureds for all losses and damages caused by, arising out of or resulting from any perils, to the extent covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

**H.** Except as otherwise provided in this subsection H and in accordance with the provisions of subsection C hereof, the agreement between CONTRACTOR and the Subcontractor or Supplier referred to in subsection G, shall provide that the CONTRACTOR and the Subcontractor or Supplier agree not to request CITY or CITY's Representative to intervene in or facilitate the resolution of claims or contract disputes arising out of or related to the agreement between CONTRACTOR and the Subcontractor or Supplier. Furthermore, the Contracts between CONTRACTOR and Subcontractors or Suppliers shall provide that all unresolved claims and disputes between CONTRACTOR and the Subcontractor or Supplier that remain unresolved after thirty (30) calendar days from the notice of claim, shall be subject to mediation as a condition precedent to the institution of legal proceedings by either party. Any such mediation shall be conducted in accordance with the CITY's Code Section 3-467.

**I.** CONTRACTOR shall not insert any provision in any subcontractor agreement associated with this Contract that explicitly states or implies that the subcontractor shall only be paid for work performed if or when the general CONTRACTOR is paid by the CITY . Contractor's compliance with this provision is a material term of this Contract.

**J.** CONTRACTORS shall not deny any Subcontractor subcontracting opportunities solely because the Subcontractor is not a signatory to collective bargaining agreements with organized labor.

## **6.08 Patent Fees and Royalties**

**A.** CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation into the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work, and if to the actual knowledge of CITY or DESIGN PROFESSIONAL its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by CITY in the Contract Documents. To the fullest extent permitted by Laws or Regulations, CONTRACTOR shall defend, indemnify and hold harmless CITY, DESIGN PROFESSIONAL, Consultants and the

officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation into the Work of any invention, design, process, product or device not specified in the Contract Documents.

## **6.09 Permits**

**A.** Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. CITY shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Contract. CONTRACTOR shall pay all charges of utility owners for connections to the Work.

**B.** CONTRACTOR, at its own expense, shall comply with all Federal, State and local laws and regulations, including, but not limited to the Missouri Clean Water Law (Chapter 644 RSMo) together with any accompanying regulation(s) contained in the Missouri Code of State Regulations (CSR Title 10), as well as any implementing permits, together with any CITY Provisions during the life of this Contract including but not limited to:

1. Approvals and permits as required for construction or land disturbance activities.
2. Compliance with the State of Missouri – Department of Natural Resources (“MDNR”) Missouri State Operating Permit (“Land Disturbance Permit”), MO-R100006 for all construction or land disturbance activity.
3. Development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).
  - (a) Contractor shall not commence land disturbance activity until the initial SWPPP has been finalized.
  - (b) Preparation and submittal of all applications, documentation and exhibits required to obtain MDNR approvals for uninterrupted Work at the Site.
  - (c) Amending/Updating SWPPP.
  - (d) Site Inspections and submittal of Inspection Reports
  - (e) Proper Operation and Maintenance to achieve compliance with the terms of the Permit.
  - (f) Maintenance of required records in accordance with MDNR requirements and requirements included in Article 6 of these Contract Documents.
4. In addition to requirements of Article 6, Contractor shall also provide record access to Missouri Department of Natural Resources (MDNR).
5. Failure to control erosion and water pollution is a permit violation. CONTRACTOR shall have 24 hours after receiving notice of the violation to correct the problem. If the CONTRACTOR fails to correct the problem after the time prescribed, the City will hire a remediation expert to fix the problem. In such an event, the CONTRACTOR shall be liable to the City for the remediation costs plus a 10% mark-up of the total contract price. If the CONTRACTOR receives three (3) notices of violation of the erosion control plan and the City’s MS4 permit, the Director may issue a stop work order and delay any payment until control measures are properly functioning and stream damage has been mitigated. In such an event, any delay to the project schedule will result in liquidated damages assessed against the CONTRACTOR.

## 6.10 Compliance with Laws and Regulations

**A. CONTRACTOR** shall give all notices and comply with all Laws or Regulations applicable to furnishing and performing the Work. Except where otherwise expressly required by applicable Laws or Regulations, neither CITY nor DESIGN PROFESSIONAL shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations. The Laws or Regulations included in this Paragraph shall include, but not be limited to, those set forth in the Supplementary Conditions.

**B. Failure to Comply.** If CONTRACTOR performs any Work in violation of applicable Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws or Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under Paragraph 3.03.

**C. Conflicts of Interest.** The provisions of City's Code Sections 2-1015 and 3-301, prohibiting City officers and employees from having a financial or personal interest in any contract with City, and Code Sections 3-307, and 3-309, imposing sanctions for violations, shall apply to this Contract. CONTRACTOR certifies that no officer or employee of City has, or will have, a direct or indirect financial or personal interest in this Contract, and that no officer or employee of City, or member of such officer's or employee's immediate family, either has negotiated, or has or will have an arrangement concerning employment to perform services on behalf of CONTRACTOR on this Contract.

**D. Licenses and Permits.** CONTRACTOR, at its own expense, shall secure or cause to be secured all licenses and permits from public or private sources necessary for the fulfillment of its obligations under this Contract. All references in this Contract to the "Code" shall mean City's Code of Ordinances, including any amendments thereto or re-codification thereof unless the context clearly indicates otherwise. CONTRACTOR shall obtain copies of all necessary licenses and permits from Subcontractors required for the Work before Subcontractors begin Work at the Site. CONTRACTOR shall retain such evidence in its files and make available to CITY within ten (10) days after CITY's written request.

**E. Americans with Disabilities Act.** CONTRACTOR agrees to comply, during the course of this Contract, with all provisions of Title II of the 2010 ADA Standards for Accessible Design as amended from time to time.

**F. Affirmative Action.** If the Contract Price exceeds \$300,000.00 and CONTRACTOR employs fifty (50) or more people, CONTRACTOR shall comply with City's Affirmative Action requirements in accordance with the provisions of Chapter 3 of City's Code, the rules and regulations relating to those sections, and any additions or amendments thereto. CONTRACTOR shall not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age in a manner prohibited by Chapter 3 of City's Code.

CONTRACTOR shall:

1. Submit, in print or electronic format, a copy of CONTRACTOR'S current certificate of compliance to the City's Human Relations Department (HRD) prior to receiving the first payment under the contract, unless a copy has already been submitted to HRD at any point within the previous two calendar years. If, and only if, CONTRACTOR does not possess a current certification of compliance, CONTRACTOR shall submit, in print or electronic format, a copy of its affirmative action program to HRD prior to receiving the first payment under the contract, unless a copy has already been submitted to HRD at any point within the previous two calendar years.

2. Require any Subcontractor awarded a subcontract exceeding \$300,000.00 to affirm that Subcontractor has an affirmative action program in place and will maintain the affirmative action program in place for the duration of the subcontract.

3. Obtain from any Subcontractor awarded a subcontract exceeding \$300,000.00 a copy of the Subcontractor's current certificate of compliance and tender a copy of the same, in print or electronic format, to HRD within thirty (30) days from the date the subcontract is executed. If, and only if, Subcontractor does not possess a current certificate of compliance, CONTRACTOR shall obtain a copy of the Subcontractor's affirmative action program and tender a copy of the same, in print or electronic format, to HRD within thirty (30) days from the date the subcontract is executed.

City has the right to take action as directed by City's Human Relations Department to enforce this provision. If CONTRACTOR fails, refuses or neglects to comply with the provisions of Chapter 3 of City's Code, then such failure shall be deemed a total breach of this Contract and this Contract may be terminated, canceled or suspended, in whole or in part, and CONTRACTOR may be declared ineligible for any further contracts funded by City for a period of one (1) year. This is a material term of this Contract.

**G. Minority and Women Business Enterprises and Workforce.** City is committed to ensuring that minorities and women participate to the maximum extent possible in the performance of City's construction contracts. If minority and women business enterprise (M/WBE) goals have been set for this Contract, CONTRACTOR agrees to comply with all requirements of City's Minority and Women's Business Enterprise Program as enacted in City's Code, Sections 3-421 through 3-469 and as hereinafter amended. CONTRACTOR shall meet or exceed both the MBE and WBE goals set forth in its Contractor Utilization Plan/Request for Waiver. If workforce utilization goals are applicable to this Contract, CONTRACTOR agrees to comply with all requirements of City's Construction Employment Program as enacted in City's Code, Sections 3-501 through 3-525 and as hereinafter amended. CONTRACTOR shall meet or exceed the construction employment goals unless the same shall have been waived in the manner provided by law. CONTRACTOR's compliance with this provision is a material part of this Contract.

**H. Records.**

1. For purposes of this section:

(a) "City" shall mean the City Auditor, the City's Internal Auditor, the City's Director of Human Relations, the City Manager, the City department administering this Contract and their delegates and agents.

(b) "Record" shall mean any document, book, paper, photograph, map, sound recordings or other material, regardless of physical form or characteristics, made or received in connection with this Contract and all Contract amendments and renewals.

2. Contractor shall maintain and retain all Records for a term of five (5) years that shall begin after the expiration or termination of this Contract and all Contract amendments. City shall have a right to examine or audit all Records and Contractor shall provide access to City of all records upon ten (10) days written notice from the City.

**I. Prevailing Wage.**

1. CONTRACTOR shall comply and require its Subcontractors to comply with;

a. sections 290.210 to 290.340, RSMO the State of Missouri Prevailing Wage Law (the "Law"); and

b. 8 CSR 30-3.010 to 8 CSR 30-3.060, the Prevailing Wage Law Rules (the "Rules"); and

c. the Annual Wage Order (Wage Order) issued by the State of Missouri's Department of Labor and Industrial Relations; and

d. any applicable Annual Incremental Wage Increase (Wage Increase) to the Annual Wage Order.

2. The Law, Rules, Annual Wage Order and any Wage Increase are incorporated into and made part hereof this Contract and shall be collectively referred to in this Section as the "Prevailing Wage Requirements."

3. CONTRACTOR shall pay and require its Subcontractors to pay to all workers performing work under this Contract not less than the prevailing hourly rate of wages for the class or type of work performed by the worker in accordance with the Law, Rules, Wage Order and any applicable Wage Increase. CONTRACTOR shall take whatever steps are necessary to insure that the prevailing hourly wage rates are paid and that all workers for CONTRACTOR and each of its Subcontractors are paid for the class or type of work performed by the worker in accordance with the Prevailing Wage Requirements. If CONTRACTOR shall fail to start to perform CONTRACTOR's obligations under the Contract Documents within sixty (60) days from the Effective Date of the Contract, CONTRACTOR and each of its subcontractors shall be obligated to pay all workers in accordance with any new Wage Order, as subsequently amended by any applicable Wage Increase, issued by the Department of Labor and Industrial Relations within the aforementioned sixty (60) day period. The new Wage Order and any applicable Wage Increase shall govern notwithstanding the fact that the Wage Order being replaced might be physically attached or incorporated in the Contract Documents.

4. Prior to each of its Subcontractors beginning Work on the Site, CONTRACTOR shall require each Subcontractor to complete CITY's Form 00490 entitled "Pre-contract Certification" that sets forth the Subcontractor's prevailing wage and tax compliance history for the two (2) years prior to the bid. CONTRACTOR shall retain one (1) year and make the Pre-contract Certifications available to CITY within five (5) days after written request.

5. CONTRACTOR shall:

a. Keep and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to keep full and accurate records on City's "Daily Labor Force Report" Form indicating the worker's name, occupational title or classification group & skill and the workers' hours. City shall furnish blank copies of the Daily Labor Force Report Form to Contractor for its use and for distribution to Subcontractors. Contractor shall submit its and its Subcontractors Daily Labor Force Reports to City each day; and

b. Submit, and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to submit electronically, in a format prescribed by the City, Certified Payroll Report Information indicating the worker's name, address, social security number, occupation(s), craft(s) of every worker employed in connection with the public work together with the number of hours worked by each worker and the actual wages paid in connection with the Project and other pertinent information as requested by the City; and

c. Submit, and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to submit, electronically, in format prescribed by the City, a Payroll Certification. The Payroll Certification must be signed by the employee or agent who pays or supervises the payment of the workers employed under the Contract for the Contractor and each Subcontractor; and

d. The Daily Labor Force Report, documents used to compile information for the Certified Payroll Report, and Payroll Certification are collectively referred to in this Section as the "Records."

6. CONTRACTOR shall submit its and its Subcontractors Daily Labor Force Reports to CITY each day. CONTRACTOR shall make all of CONTRACTOR's and Subcontractors' Records open to inspection by any authorized representatives of OWNER and the Missouri Department of Labor and Industrial Relations at any reasonable time and as often as they may be necessary and such Records shall not be destroyed or removed from the State of Missouri for a period of one (1) year following the completion of the public work in connection with which the Records are made. CONTRACTOR shall have its and its Subcontractors Certified Payroll Reports and Payroll Certifications available at the CONTRACTOR's office and shall provide the Records to the City electronically at City's sole discretion. In addition, all Records shall be considered a public record and CONTRACTOR shall provide the Records

to the CITY in the format required by the CITY within three (3) working days of any request by CITY at the CONTRACTOR's cost. CITY, in its sole discretion, may require CONTRACTOR to send any of the Records directly to the person who requested the Record at CONTRACTOR's expense.

7. CONTRACTOR shall post and keep posted a clearly legible statement of all prevailing hourly wage rates to be paid to all workers employed by CONTRACTOR and each of its Subcontractors in the performance of this Contract in a prominent and easily accessible place at the Site of the Work by all workers.

8. If the Contract Price exceeds \$250,000.00, CONTRACTOR shall and shall require each Subcontractor engaged in any construction of public works to have its name, acceptable abbreviation or recognizable logo and the name of the city and state of the mailing address of the principal office of the company, on each motor vehicle and motorized self-propelled piece of equipment which is used in connection with the Project during the time the CONTRACTOR or Subcontractor is engaged on the project. The sign shall be legible from a distance of twenty (20') feet, but the size of the lettering need not be larger than two (2") inches. In cases where equipment is leased or where affixing a legible sign to the equipment is impractical, the CONTRACTOR may place a temporary stationary sign, with the information required pursuant to this section, at the main entrance of the Project in place of affixing the required information on the equipment so long as such sign is not in violation of any state or federal statute, rule or regulation. Motor vehicles which are required to have similar information affixed thereto pursuant to requirements of a regulatory agency of the state or federal government are exempt from the provisions of this subsection.

9. CONTRACTOR must correct any errors in CONTRACTOR's or any Subcontractors' Records, or CONTRACTOR's or any Subcontractors' violations of the Law, Rules, Annual Wage Order and any Wage Increase within fourteen (14) calendar days after notice from CITY.

10. CONTRACTOR shall and shall require its Subcontractors to cooperate with the CITY and the Department of Labor and Industrial Relations in the enforcement of this Section, the Law, Rules, Annual Wage Order and any Wage Increase. Contractor shall and shall require its Subcontractors to permit CITY and the Department of Labor and Industrial Relations to interview any and all workers during working hours on the Project at CONTRACTOR's sole cost and expense.

11. CONTRACTOR shall file with CITY, upon completion of the Project and prior to final payment therefore, affidavits from CONTRACTOR and each of its Subcontractors, stating that each has fully complied with the provisions and requirements of the Missouri Prevailing Wage Law. CITY shall not make final payment until the affidavits, in proper form and order, from CONTRACTOR and each of its Subcontractors, are filed by CONTRACTOR.

12. CONTRACTOR shall forfeit as a statutory penalty to the CITY one hundred dollars (\$100.00) for each worker employed, for each calendar day, or portion thereof, such worker is paid less than the prevailing hourly rates for any work done under this Contract, by CONTRACTOR or by any of CONTRACTOR's Subcontractors. If CONTRACTOR or any of its Subcontractors have violated any section(s) of 290.210 to 290.340, RSMo, in the course of the execution of the Contract, CITY shall when making payments to the CONTRACTOR becoming due under this Contract, withhold and retain therefrom all sums and amounts due and owing as a result of any violation of sections 290.210 to 290.340, RSMo.

**J. Prevailing Wage Damages.** CONTRACTOR acknowledges and agrees that, based on the experience of CITY, violations of the Missouri Prevailing Wage Act, whether by CONTRACTOR or its Subcontractors, commonly result in additional costs to CITY. CONTRACTOR agrees that additional costs to CITY for any particular violation are difficult to establish and include but are not limited to: costs of construction delays, additional work for CITY, additional interest expenses, investigations, and the cost of establishing and maintaining a special division working under the City Manager to monitor prevailing wage compliance.

1. In the event of the failure by CONTRACTOR or any of its Subcontractors to pay wages as provided in the Missouri Prevailing Wage Act, CITY shall be entitled to deduct from the Contract Price, and shall retain as liquidated damages, one hundred dollars (\$100.00) per day, per worker who is paid less than the prevailing hourly rate of wages, to approximate the additional costs. The sum shall be deducted, paid or owed whether or not the Contract Times have expired.

2. CITY shall give written notice to CONTRACTOR setting forth the workers, who have been underpaid, the amount of the statutory penalty and the amount of the liquidated damages as provided for in this Subparagraph J. CONTRACTOR shall have fourteen (14) calendar days to respond, which time may be extended by CITY upon written request. If CONTRACTOR fails to respond within the specified time, the CITY's original notice shall be deemed final. If CONTRACTOR responds to CITY's notice, CITY will furnish CONTRACTOR a final decision in writing within five (5) days of completing any investigation.

**K. Missouri Secretary of State Business Entity Registration.** CONTRACTOR shall obtain from all Subcontractors for the Project, a copy of their current certificate of good standing or fictitious name registration from the Missouri Secretary of State before they begin work on the Site. CONTRACTOR shall retain such documents in its files and make available to CITY within ten (10) days after written request.

**L. Tropical Hardwoods.** The provisions of Code Section 2-1872, restricting the use of tropical hardwoods, shall apply to this Contract.

**M. Preference for Missouri Products.** Pursuant to Section 71.140 RSMo., preference shall be given to materials, products, supplies and all other articles produced, manufactured, made or grown within the State of Missouri.

**N. Guidelines for Open Excavations.**

1. CONTRACTOR shall restore required excavations to the level of the adjacent surfaces as soon as practicable. Unsupervised open excavations on public properties are discouraged at all times. If CONTRACTOR, in performance of the Work, makes or causes to be made any excavation in, upon, under, through or adjoining any street, sidewalk, alley, park, boulevard, parkway or any other public properties, and shall leave any part or portion thereof open, CONTRACTOR shall provide effective protection to the public.

2. CONTRACTOR shall protect and secure all excavations in roadways in compliance with existing federal, state and local codes and standards, including, but not limited to the most current edition of the Manual of Uniform Traffic Control Devices. CONTRACTOR shall protect and secure all unsupervised excavations not within roadways, either by covering or fencing.

a. Covering. A protective cover that can sustain the weight of persons or of objects that are placed upon it may be installed over an unsupervised excavation. The cover shall be secured to the ground to prevent movement. Protective covers shall have no opening(s) or protuberance(s) of sufficient size to cause a fall and/or injury. Advance warning devices shall be installed as necessary.

b. Fencing. Fencing to prevent entry may be installed surrounding an unsupervised excavation not protectively covered in its entirety. The fencing shall be a minimum of 42" in height. The fencing shall be constructed in such a manner that it is adequately secured and will remain upright at all times under normal Site conditions. All protective coverings and fences over and around excavations shall be inspected at least daily to assure integrity. Protective coverings and/or fences in heavily trafficked areas shall be inspected more often as necessary.

**O. Notification of Utilities.** CONTRACTOR shall adhere to the provisions of Sections 319.010 et seq., RSMo., which requires that a person or firm making an excavation in any public street, road or alley, right of way dedicated to public use, utility easement of record, or within any private street or private property do so only after giving notice to, and obtaining information from,

owners of Underground Facilities. The 24-hour, toll-free accident prevention hotline number in Missouri is 1-800-344-7483 (1-800-Digrite).

**P. Employee Eligibility Verification.** CONTRACTOR shall adhere to the provisions of Sections 285.525 et seq., RSMo., which requires that for any contract exceeding five thousand dollars (\$5,000.00), CONTRACTOR shall execute and submit an affidavit, in a form prescribed by CITY, affirming that CONTRACTOR does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U.S.C. § 1324a(h)(3). CONTRACTOR shall attach to the affidavit documentation sufficient to establish CONTRACTOR'S enrollment and participation in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986. CONTRACTOR may obtain additional information about E-Verify and enroll at <https://e-verify.uscis.gov/enroll/StartPage.aspx?JS=YES>. For those Contractors enrolled in E-Verify, the first and last pages of the E-Verify Memorandum of Understanding that CONTRACTOR will obtain upon successfully enrolling in the program shall constitute sufficient documentation for purposes of complying with this Section. CONTRACTOR shall submit the affidavit and attachments to CITY prior to execution of the Contract, or at any point during the term of the Contract if requested by City.

**Q. OSHA 10-Hour Training Requirement.** CONTRACTOR and any subcontractor working under this Contract shall require every employee on the Site to complete a ten-hour construction safety program which meets the requirements of Section 292.675, RSMo, except for those employees who shall have previously completed the required program and hold documentation to that effect. CONTRACTOR shall remove or require the removal of any person from the Site who is subject to this requirement and who does not complete or is unable to produce documentation of their successful completion of the required program within the time limitations prescribed by Section 292.675, RSMo. CONTRACTOR shall forfeit the sum of two thousand five hundred dollars (\$2,500.00), in addition to one hundred dollars (\$100.00) per employee each calendar day, or portion thereof, the employee(s) shall continue to be employed without having completed the required program within the time limitations prescribed by Section 292.675, RSMo. CITY shall be entitled to withhold and retain any amounts due and owing hereunder when making payment to CONTRACTOR.

**R. Clean Air Act and Clean Water Act.** CONTRACTOR shall comply with requirements of the Clean Air Act (42 U.S.C. 7401 *et seq.*); Clean Water Act (33 U.S.C. 1251 *et seq.*), Missouri Clean Water Law (Chapter 644 RSMo), Code of Federal regulations (Title 40: Protection of Environment, Title 33: Navigation and Navigable Waters) and the rules of the Missouri Code of State Regulations (CSR Title 10).

**S. Contract information Management System.** If applicable, CONTRACTOR shall comply with CITY'S Contract Information Management System requirements. CONTRACTOR shall use CITY'S Internet web based Contract Information Management System/Project Management Communications Tool provided by CITY and protocols included in that software during the term of this Contract. CONTRACTOR shall maintain user applications to CITY'S provided system for all personnel, subcontractors or suppliers as applicable and shall require subcontractors/subconsultants to maintain same.

**T. Anti-Discrimination Against Israel.** If this Contract exceeds \$100,000.00 and CONTRACTOR employs at least ten employees, pursuant to Section 34.600, RSMo., by executing this Contract, CONTRACTOR certifies it is not currently engaged in and shall not, for the duration of this contract, engage in a boycott of goods or services from the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel.

## 6.11 Taxes

**A.** CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws or Regulations of the place of the Project which are applicable during the performance of the Work.

### **B. Tax Compliance.**

1. As a condition precedent to CITY making its first payment to CONTRACTOR under this Contract, CONTRACTOR shall furnish to CITY sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year prior to the date provided to CITY, verifying that CONTRACTOR is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department.

2. As a condition precedent to Subcontractors performing any Work under this Contract, CONTRACTOR shall obtain from Subcontractor sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year before the date Subcontractor begins Work, verifying that the Subcontractor is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department. CONTRACTOR shall retain such documentation in its files and make available to CITY within ten (10) days after a written request.

3. As a condition precedent to CITY making final payment under this Contract, if this Contract is longer than one (1) year and exceeds the dollar threshold established by ordinance and included in the Supplementary Conditions, CONTRACTOR shall furnish to CITY sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year before the filing of a final Application for Payment, verifying that CONTRACTOR is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department.

4. If this Contract is longer than one (1) year and exceeds the dollar threshold established by ordinance and included in the Supplementary Conditions, CONTRACTOR shall obtain from Subcontractors sufficient proof from City's Commissioner of Revenue, dated not more than one (1) year before the date of CONTRACTOR's final payment to the Subcontractor, that the Subcontractor was or is in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department. CONTRACTOR shall retain such documentation in its files and make available to CITY within ten (10) days after written request.

5. If, at the time of final payment to CONTRACTOR, CONTRACTOR is unable to obtain from all its Subcontractors, if any, and furnish to CITY sufficient proof from City's Commissioner of Revenue that all its Subcontractors are in compliance with the license and tax ordinances administered by City's Revenue Division of the Finance Department, CITY may approve final payment to CONTRACTOR if CITY determines that CONTRACTOR has made a good faith effort to furnish evidence or that there are other extenuating circumstances which make it impossible for CONTRACTOR to furnish sufficient proof.

**C. Missouri Sales Tax Exemption.** Pursuant to Section 144.062, RSMo, CITY is a Missouri exempt entity and tangible personal property to be incorporated or consumed in the construction of this Project may be purchased without sales tax. CITY shall furnish CONTRACTOR a Missouri Project Exemption Certificate for Sales Tax at the time of issuance of the Notice to Proceed.

## 6.12 Use of Site and Other Areas

**A.** CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas identified in and permitted by the Contract Documents and other areas permitted by Laws or Regulations. CONTRACTOR shall not unreasonably encumber the Site and the other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to the Site or the other areas, or to the owner or occupant thereof, or of any adjacent land or areas, resulting from the performance of the Work.

**B.** Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. In case of a failure on the part of the CONTRACTOR to restore such property or to make good such damage or injuries, the CITY may, upon forty-eight (48) hours written notice to the CONTRACTOR, repair, rebuild or otherwise restore such property as the CITY may deem necessary, and the cost thereof will be deducted from any moneys due or which may become due the CONTRACTOR under this Contract.

**C.** CONTRACTOR shall, to the fullest extent permitted by Laws or Regulations, defend, indemnify and hold harmless CITY, DESIGN PROFESSIONAL, Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against CITY, DESIGN PROFESSIONAL or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

**D.** During the progress of the Work, CONTRACTOR shall keep the Site and the other areas free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from Site and other areas as well as all tools, appliances, construction equipment and machinery and surplus materials. CONTRACTOR shall leave the Site clean and ready for utilization or occupancy by CITY at Substantial Completion of the Work. CONTRACTOR shall restore to all property not designated for alteration by the Contract Documents to its pre-Work condition.

**E.** CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

### **6.13 Record Documents**

**A.** CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, the Contract, Written Amendments, Change Orders, Work Change Directives, and written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents, together with all approved Samples and a counterpart of all approved Shop Drawings, will be available to CITY and DESIGN PROFESSIONAL for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered to DESIGN PROFESSIONAL for CITY.

### **6.14 Safety and Protection**

**A.** CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall comply with all applicable Laws or Regulations relating to the safety of persons or property to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for safety and protection. CONTRACTOR shall deliver to CITY a copy of CONTRACTOR'S Health and Safety Plan as provided in the Notice of Intent to Contract.

**B.** CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in Paragraph 6.14 B.2 or 6.14 B.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of CITY, DESIGN PROFESSIONAL, Consultant, or anyone employed by any of them or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in

part, to the fault or negligence of CONTRACTOR, Subcontractor, Supplier or other person or organization directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and DESIGN PROFESSIONAL has issued a notice to CONTRACTOR in accordance with Paragraph 14.07 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion). CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of the Work.

### **6.15 Safety Representative**

**A.** In accordance with OSHA standards, CONTRACTOR shall designate a qualified and experienced safety representative whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs. CONTRACTOR's safety representative shall remain at the Site whenever there is Work in progress and shall immediately notify CITY of any emergencies or accidents occurring at the Site

### **6.16 Hazard Communication Programs**

**A.** CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

### **6.17 Emergencies**

**A.** In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR, without special instruction or authorization from CITY or DESIGN PROFESSIONAL, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give CITY and DESIGN PROFESSIONAL prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If CITY determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to an emergency, a Work Change Directive or Change Order will be issued.

**B.** A change in the Contract Documents pursuant to Paragraph 6.15 A will not be an automatic authorization of, nor a condition precedent to, entitlement to adjustment in the Contract Price or Contract Times. If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price or Contract Times, a Claim may be made therefore as provided in Article 16. However, OWNER, DESIGN PROFESSIONAL and Consultants shall not be liable to CONTRACTOR for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

### **6.18 Shop Drawings and Samples**

**A.** CONTRACTOR shall submit Shop Drawings to DESIGN PROFESSIONAL for review and approval in accordance with the accepted schedule of Shop Drawings and Sample submittals (see Paragraph 2.07). All submittals shall be identified as DESIGN PROFESSIONAL may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show DESIGN PROFESSIONAL the services, materials and equipment CONTRACTOR proposes to provide and to enable DESIGN

PROFESSIONAL to review the information for the limited purposes required by Paragraph 6.18 D.

**B.** CONTRACTOR shall also submit Samples to DESIGN PROFESSIONAL for review and approval in accordance with said accepted schedule of Shop Drawings and Sample submittals. Each Sample shall be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as DESIGN PROFESSIONAL may require to enable DESIGN PROFESSIONAL to review the submittal for the limited purposes required by Paragraph 6.18 D. The numbers of each Sample to be submitted will be as specified in the Specifications.

**C. Submittal Procedures:**

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;

b. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work;

c. all information relative to means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto; and

d. CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

3. At the time of each submission, CONTRACTOR shall give DESIGN PROFESSIONAL specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, the notice to be in a written communication separate from the submittal, and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to DESIGN PROFESSIONAL for review and approval of each such variation.

**D. DESIGN PROFESSIONAL's Review:**

1. DESIGN PROFESSIONAL will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by DESIGN PROFESSIONAL as required by Paragraph 2.06. DESIGN PROFESSIONAL's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation into the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. DESIGN PROFESSIONAL's review and approval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. DESIGN PROFESSIONAL's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called DESIGN PROFESSIONAL's attention to each such variation at the time of submission as required by Paragraph 6.18 C.3,

and DESIGN PROFESSIONAL has given written approval of each such variation by specific written notation thereof incorporated into or accompanying the Shop Drawing or Sample approval; nor will any approval by DESIGN PROFESSIONAL relieve CONTRACTOR from responsibility for complying with the requirements of Paragraph 6.18 C.1.

**E.** Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by DESIGN PROFESSIONAL as required by Paragraph 2.06, any related Work performed prior to DESIGN PROFESSIONAL's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

**F.** CONTRACTOR shall make corrections required by DESIGN PROFESSIONAL and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by DESIGN PROFESSIONAL on previous submittals.

### **6.19 Continuing the Work**

**A.** CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with CITY. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as CITY and CONTRACTOR may otherwise agree in writing.

### **6.20 CONTRACTOR's General Warranty and Guarantee**

**A.** CONTRACTOR warrants and guarantees to CITY, DESIGN PROFESSIONAL and Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers or any other individual or entity for whom CONTRACTOR is responsible; or
2. normal wear and tear under normal usage.

**B.** CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by DESIGN PROFESSIONAL;
2. recommendation of any progress or final payment by DESIGN PROFESSIONAL;
3. the issuance of a certificate of Substantial Completion or any payment related thereto by CITY to CONTRACTOR;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by DESIGN PROFESSIONAL;
6. any inspection, test or approval by others; or
7. any correction of defective Work by CITY.

**C.** Nonconforming Work is rejected unless expressly accepted in writing by the CITY's Representative.

## **ARTICLE 7 OTHER WORK**

### **7.01 Related Work at Site**

**A.** CITY may perform other work related to the Project at the Site by CITY's own forces, or let other direct contracts therefore, or have other work performed by utility owners. If such other work is to be performed and such fact was not noted in the Contract Documents, then:

1. Written notice thereof will be given to CONTRACTOR prior to starting any such other work, and

2. CONTRACTOR may make a Claim therefore as provided in Article 16 if CONTRACTOR believes that such performance involves additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the amount or extent thereof.

**B.** CONTRACTOR shall afford each other contractor who is a party to such a direct contract, and each utility owner (and CITY, if CITY is performing the additional work with CITY's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of CITY and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between CITY and such utility owners and other contractors.

**C.** If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to CITY and DESIGN PROFESSIONAL in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution or results of CONTRACTOR's Work. CONTRACTOR's failure to report same will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work, except for latent or non-apparent defects and deficiencies in such other work.

## **7.02 Coordination**

**A.** If CITY contracts with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the person, firm or corporation who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified;
2. the specific matters to be covered by such authority and responsibility will be itemized; and
3. the extent of such authority and responsibilities will be provided.

**B.** Unless otherwise provided in the Supplementary Conditions, CITY shall have sole authority and responsibility in respect of such coordination.

## **ARTICLE 8 CITY'S RESPONSIBILITIES**

### **8.01 Communications to CONTRACTOR**

**A.** Except as otherwise provided in these General Conditions, CITY shall issue all communications to CONTRACTOR.

### **8.02 Replacement of DESIGN PROFESSIONAL**

**A.** In case of termination of the employment of DESIGN PROFESSIONAL, CITY shall appoint a DESIGN PROFESSIONAL whose status under the Contract Documents shall be that of the former DESIGN PROFESSIONAL.

### **8.03 Furnish Data and Prompt Payment**

A. CITY shall promptly furnish the data required of OWNER under the Contract Documents and shall make payments to CONTRACTOR when they are due.

### **8.04 Lands and Easements; Reports and Tests**

A. CITY's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to CITY's duty to identify and make available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the Site and drawings of physical conditions in existing structures at or contiguous to the Site that have been utilized by DESIGN PROFESSIONAL in preparing the Contract Documents.

### **8.05 Insurance**

A. CITY's responsibilities, if any, for purchasing and maintaining liability and property insurance are set forth in Article 5 and the Supplementary Conditions.

### **8.06 Change Orders**

A. CITY is obligated to execute Change Orders as indicated in Paragraph 10.03.

### **8.07 Inspections, Tests and Approvals**

A. CITY's responsibility for certain inspections, tests and approvals is set forth in Paragraph 13.02 F.

### **8.08 Limitations on CITY's Responsibilities**

A. The CITY shall not supervise, direct or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws or Regulations applicable to the furnishing or performance of the Work. CITY will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

### **8.09 Undisclosed Hazardous Environmental Condition**

A. CITY's responsibility for an undisclosed Hazardous Environmental Condition uncovered or revealed at the Site is set forth in Paragraph 4.06.

### **8.10 Evidence of Financial Arrangements**

A. CITY will furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract.

### **8.11 CITY's Representative**

A. CITY will provide a representative during the construction period. The duties, responsibilities and the limitations of authority of the CITY "'s Representative during construction are set forth in the Contract Documents.

### **8.12 Visits to Site**

A. CITY's Representative will make visits to the Site at intervals appropriate to the various stages of construction as CITY's Representative deems necessary in order to observe the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, CITY's Representative will endeavor to determine, in general, if the Work is proceeding in accordance with the Contract Documents. CITY's Representative will not be required to make exhaustive or continuous on-Site inspections to check the quality or quantity of the Work.

## **ARTICLE 9 DESIGN PROFESSIONAL'S STATUS DURING CONSTRUCTION**

### **9.01 General Scope of DESIGN PROFESSIONAL's Duties**

**A.** DESIGN PROFESSIONAL's efforts will be directed toward providing for CITY a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of visits to the Site and on-Site observations, DESIGN PROFESSIONAL will keep CITY informed of the progress of the Work and will endeavor to guard CITY against defective Work. DESIGN PROFESSIONAL's visits to the Site and on-Site observations are subject to all the limitations on DESIGN PROFESSIONAL's authority and responsibility set forth in Paragraph 9.08.

#### **9.02 Resident Project Representative**

**A.** If CITY and DESIGN PROFESSIONAL agree, DESIGN PROFESSIONAL will furnish a resident Project representative to assist DESIGN PROFESSIONAL in providing more extensive observation of the Work. The responsibilities, authority and limitations thereon of any such resident Project representative and assistants will be as provided in Paragraph 9.08 and in the Supplementary Conditions.

#### **9.03 Clarifications and Interpretations**

**A.** DESIGN PROFESSIONAL will issue with reasonable promptness written clarifications or interpretations (which may be in the form of Drawings) of the requirements of the Drawings and Specifications prepared by the DESIGN PROFESSIONAL as DESIGN PROFESSIONAL may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on CITY and CONTRACTOR. If CITY or CONTRACTOR believes that a written clarification or interpretation justifies an adjustment in the Contract Price pursuant to Article 11 and/ or the Contract Times pursuant to Article 12 and the parties are unable to agree to the amount or extent thereof, if any, a Claim may be made therefore as provided in Article 16.

#### **9.04 Rejecting Defective Work**

**A.** DESIGN PROFESSIONAL will have authority to disapprove or reject Work which DESIGN PROFESSIONAL believes to be defective, that DESIGN PROFESSIONAL believes will not produce a completed Project that conforms to the Contract Documents, or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. DESIGN PROFESSIONAL will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04 B, whether or not the Work is fabricated, installed or completed.

#### **9.05 Shop Drawings, Change Orders and Payments**

**A.** In connection with DESIGN PROFESSIONAL's authority as to Shop Drawings and Samples, see Paragraph 6.18.

**B.** In connection with DESIGN PROFESSIONAL's authority as to Change Orders, see Article 10.

**C.** In connection with DESIGN PROFESSIONAL's authority as to Applications for Payment, see Article 14.

#### **9.06 Determinations for Unit Prices**

**A.** DESIGN PROFESSIONAL will initially determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. DESIGN PROFESSIONAL will review with CONTRACTOR the DESIGN PROFESSIONAL's preliminary determinations on such matters before rendering a written opinion thereon (by recommendation of an Application for Payment or otherwise to the CITY). CITY reserves the right to make a final determination of the actual quantities and classifications of Unit Price Work in reviewing an Application for Payment. Within ten (10) days after the date of receipt of any such decision, CONTRACTOR may deliver to CITY and to DESIGN PROFESSIONAL written notice of intention to appeal CITY's decision pursuant to Article 16.

## **9.07 Decisions on Requirements of Contract Documents and Acceptability of Work**

**A.** DESIGN PROFESSIONAL will be the initial interpreter of the requirements of the Drawings and Specifications prepared by DESIGN PROFESSIONAL and judge of the acceptability of the Work thereunder.

**B.** When functioning as interpreter and judge under this Paragraph 9.07, DESIGN PROFESSIONAL will not show partiality to OWNER or CONTRACTOR.

**C.** Claims, disputes and other matters relating to the acceptability of the Work, quantities and classifications of Unit Price Work, or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work will be referred initially to CITY's Representative in writing with a request for a formal decision in accordance with Article 16.

## **9.08 Limitations on DESIGN PROFESSIONAL's Authority and Responsibilities**

**A.** Neither DESIGN PROFESSIONAL's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by DESIGN PROFESSIONAL in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise or performance of any authority or responsibility by DESIGN PROFESSIONAL shall create, impose or give rise to any duty owed by DESIGN PROFESSIONAL to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them.

**B.** DESIGN PROFESSIONAL will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws or Regulations applicable to the furnishing or performance of the Work. DESIGN PROFESSIONAL will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

**C.** DESIGN PROFESSIONAL will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

**D.** DESIGN PROFESSIONAL's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, Bonds and certificates of inspection, tests and approvals and other documentation required to be delivered by Paragraph 14.07 will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests and approvals, that the results certified indicate compliance with, the Contract Documents.

**E.** The limitations upon authority and responsibility set forth in this Paragraph 9.08 shall also apply to DESIGN PROFESSIONAL's Consultants, resident Project representative and assistants as identified in the Supplementary Conditions.

## **ARTICLE 10 CHANGES IN THE WORK**

### **10.01 Authorized Changes in the Work**

**A.** Without invalidating the Contract and without notice to any surety, CITY may, at any time or from time to time, order additions, deletions or revisions in the Work. Such additions, deletions or revisions will be authorized by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved that will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

**B.** If CITY and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price pursuant to Article 11 or an adjustment of the Contract Times pursuant to Article 12 or both that should be allowed as a result of a Work Change Directive, a Claim may be made therefore as provided in Article 16.

## **10.02 Unauthorized Changes in the Work**

**A.** CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.17 or in the case of uncovering Work as provided in Paragraph 13.04.

## **10.03 Signing of Change Orders**

**A.** CITY and CONTRACTOR, and DESIGN PROFESSIONAL shall sign appropriate Change Orders covering:

1. changes in the Work which are:
  - a. ordered by CITY pursuant to Paragraph 10.01 A; or
  - b. required because of acceptance of defective Work under Paragraph 13.08 or correcting defective Work under Paragraph 13.09; or
  - c. agreed to by the parties;
2. changes in the Contract Price or Contract Times or both which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
3. changes in the Contract Price or Contract Times or both which embody the substance of any written decision recommended by DESIGN PROFESSIONAL and approved by CITY pursuant to Paragraph 9.06, provided that, in lieu of signing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws or Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in Paragraph 6.19.

## **10.04 Notification to Surety**

**A.** If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times or both) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

# **ARTICLE 11 CHANGE OF CONTRACT PRICE**

## **11.01 Change of Contract Price**

**A.** The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at CONTRACTOR's expense without change in the Contract Price.

**B.** The Contract Price may only be changed by a Change Order. Any request for an adjustment in the Contract Price shall be based on written notice delivered within fourteen (14) calendar days after occurrence of the event giving rise to the request or within fourteen (14) calendar days after first recognition of the conditions giving rise to the request. Prior notice is not required for requests or claims relating to an emergency endangering life or property as described in Paragraph 6.16. Thereafter, the CONTRACTOR shall submit written documentation of its request, including appropriate supporting documentation, within ten (10) calendar days after giving notice, unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted.

**C.** The value of any Work covered by a Change Order or of any request for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by Unit Prices contained in the Contract Documents, by application of such Unit Prices to the quantities of the items involved (subject to the provisions of Paragraph 11.04); or

2. where the Work involved is not covered by Unit Prices contained in the Contract Documents, by a mutually agreed lump sum; or

3. where the Work involved is not covered by Unit Prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 11.01 C.2, on the basis of the Cost of the Work (determined as provided in Paragraphs 11.02 A and B) plus a CONTRACTOR's fee for overhead and profit (determined as provided in Paragraph 11.01 D).

**D.** The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.02 A.1 and 11.02 A.2, the CONTRACTOR's fee shall be ten percent (10%);

b. for costs incurred under Paragraph 11.02 A.3, the CONTRACTOR's fee shall be five percent (5%);

c. where one or more tiers of subcontracts are on the basis of the Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01 D.2 and 11.02 A.1 through A.3 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be paid a fee of ten percent (10%) of the costs incurred by such Subcontractor under Paragraphs 11.02 A.1 and 11.02 A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent (5%) of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.02 A.4, 11.02 A.5 and 11.02 B;

e. the amount of credit to be allowed by CONTRACTOR to CITY for any change which results in a net decrease in cost will be the amount of the actual net decrease in costs plus a deduction in CONTRACTOR's fee by an amount equal to five percent (5%) of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.01 D.2.a through 11.01 D.2.e, inclusive.

**E.** Whenever the Cost of the Work is to be determined pursuant to Paragraphs 11.02 A and B, CONTRACTOR shall establish and maintain records thereof in accordance with generally accepted accounting practices and submit in form acceptable to CITY an itemized cost breakdown together with supporting data.

## **11.02 Cost of the Work**

**A.** The term "Cost of the Work" means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a request for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the request. Except as otherwise agreed to in writing by CITY, costs covered by Change Orders or requests shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any costs itemized in 11.02 B:

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work, using occupational titles and job classifications agreed upon by CITY and CONTRACTOR. Such employees shall include, without limitation, job Site superintendents, foremen and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing the Work after regular working hours, on Saturdays, Sundays or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated into the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless CITY deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to CITY. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to CITY, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed or furnished by Subcontractors. If required by CITY, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to CITY who will then determine, with the advice of DESIGN PROFESSIONAL, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of the Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in Paragraphs 11.01 D and E and 11.02 A and B. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work when such services are approved in advance by CITY in writing.

5. Other costs including the following:

a. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value of such items used but not consumed which remain the property of CONTRACTOR.

c. Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by CITY with the advice of DESIGN PROFESSIONAL, and the costs of transportation, loading, unloading, installation, assembly, dismantling and removal thereof, all in accordance with the terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

d. Applicable sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws or Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses required to perform the Work.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by CITY in accordance with Article 5), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of CITY. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for those services a fee proportionate to that stated in Paragraph 11.01 D.2.

g. The cost of utilities, fuel and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage and similar petty cash items in connection with the Work.

i. Cost of premiums for additional or increased Bonds, or for insurance required because of approved changes in the Work.

**B. Costs excluded:** The term "Cost of the Work" shall not include any of the following:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the Site or in CONTRACTOR's principal or a branch office for general administration of the Work (if not specifically included in the agreed upon occupational titles and job classifications referred to in Paragraph 11.02 A.1 or specifically covered by Paragraph 11.02 A.4), all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials, or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 11.02 A.

### **11.03 Cash Allowances**

**A.** It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be furnished and performed for such sums as may be acceptable to CITY. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

**B.** Prior to final payment, an appropriate Change Order will be issued by CITY to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

#### **11.04 Unit Price Work**

**A.** Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made in accordance with Paragraph 9.06.

**B.** Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

**C.** CITY or CONTRACTOR may negotiate an adjustment of the price per unit of Unit Price Work stated in the Contract if:

1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs by twenty percent (20%) or more from the estimated quantity of such item indicated in the Contract; and
2. there is no corresponding adjustment with respect to any other item of Work; and
3. CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or CITY believes that CITY is entitled to a decrease in Contract Price.

#### **11.05 Dispute Resolution**

**A.** If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price in accordance with Article 11 within fourteen (14) calendar days from the receipt of supporting documentation of the request pursuant to 11.01.B., unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted, then a Claim for such adjustment may be made pursuant to Article 16.

### **ARTICLE 12 CONTRACT TIMES**

#### **12.01 Time of the Essence**

**A.** All times stated in the Contract Documents are of the essence of the Contract.

#### **12.02 Change of Contract Times**

**A.** The Contract Times (or Milestones) may only be changed by a Change Order. Any request for an adjustment in the Contract Times shall be based on written notice delivered within fourteen (14) calendar days after occurrence of the event giving rise to the request or within fourteen (14) calendar days after first recognition of the conditions giving rise to the request. Thereafter, the CONTRACTOR shall submit written documentation of its requests, including appropriate supporting documentation, within ten (10) days after giving notice, unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted.

#### **12.03 Proof Required To Justify an Extension of Time For Excusable and Compensable Delays**

**A.** In support of any request for an extension of the Contract Times pursuant to this Article, CONTRACTOR must demonstrate to the reasonable satisfaction of the CITY that the critical path of the approved baseline project schedule was delayed. CONTRACTOR shall be entitled to an increase in contract time for the number of days that the critical path was delayed solely as a

result of the compensable or excusable event. A compensable or excusable event includes, but is not limited to:

1. unreasonable delay of issuance of Notice to Proceed by CITY;
2. CITY's unreasonable delay of delivery furnished materials, equipment, or work;
3. unreasonable delay responding to shop drawings and submittals;
4. CITY's unreasonable delay in issuing a Change Order;
5. an order by the CITY to stop the Work where the CONTRACTOR was not at fault; and
6. other reasonable grounds as determined by the City in its sole discretion.

**B.** CONTRACTOR shall compare the critical path of the approved baseline project schedule to the actual critical path of the Work, identifying the specific impact of the compensable or excusable event.

**C.** CONTRACTOR shall submit to the CITY a written time impact analysis illustrating the influence of each compensable or excusable event on the date of Substantial Completion. The time impact analysis shall demonstrate the time impact based on the date of the delay in time and the event time computations or all affected activities.

**D.** If the critical path of the Work is delayed by "Force Majeure", the CONTRACTOR shall be entitled only to an extension of the Contract Times for the number of days of delay to the critical path. For purposes of this paragraph, "Force Majeure" shall mean fire, tornado, flood, earthquake, war, act of terrorism, civil disturbance, or labor strikes away from the project site.

**E.** Extensions of contract time pursuant to the this section will be granted only to the extent that the time adjustments exceed the total float time available when the event causing the delay occurred.

#### **12.04 Delays Within CONTRACTOR's Control**

**A.** The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

#### **12.05 Delays Beyond the CITY's and CONTRACTOR's Control**

**A.** Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both CITY and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

#### **12.06 Delay Damages**

**A.** In no event shall CITY be liable to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR, or
2. delays beyond the control of CITY or CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

**B.** Nothing in this Paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inaction of CITY, DESIGN PROFESSIONAL, Consultant or anyone for whom CITY, DESIGN PROFESSIONAL or Consultant is responsible.

## **12.07 Dispute Resolution**

**A.** If CITY and CONTRACTOR are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Time in accordance with Article 12 within fourteen (14) calendar days from the receipt of supporting documentation of the request pursuant to 12.02, unless the CITY grants an extension based on good cause shown by the CONTRACTOR that such additional time is warranted, then a Claim for such adjustment may be made pursuant to Article 16.

## **ARTICLE 13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### **13.01 Access to Work**

**A.** CITY, DESIGN PROFESSIONAL, Consultants, other representatives and personnel of CITY, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the Site and Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

### **13.02 Tests and Inspections**

**A.** CONTRACTOR shall give DESIGN PROFESSIONAL and CITY's Representative timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

**B.** If any Work (or the work of others at the Site) that is to be inspected, tested or approved is covered by CONTRACTOR without written approval required by Paragraphs 13.02 D or 13.02 E, it must, if requested by CITY's Representative, be uncovered for observation.

**C.** Uncovering Work as provided in Paragraph 13.02 B, shall be at CONTRACTOR's expense unless CONTRACTOR has given DESIGN PROFESSIONAL and CITY's Representative timely notice of CONTRACTOR's intention to cover the same and DESIGN PROFESSIONAL and CITY's Representative have not acted with reasonable promptness in response to such notice.

**D.** If Laws or Regulations of any public body (including City) having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish DESIGN PROFESSIONAL and CITY's Representative the required certificates of inspection or approval.

**E.** CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for CITY's and DESIGN PROFESSIONAL's acceptance of materials or equipment to be incorporated into the Work, or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation into the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to CITY and DESIGN PROFESSIONAL.

**F.** CITY shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests or approvals covered by Paragraph 13.02 D and E;
2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04 B shall be paid as provided in said Paragraph 13.04 B; and
3. as otherwise specifically provided in the Contract Documents.

### **13.03 Notice of Defects**

**A.** Prompt notice of all defective Work of which either CITY or DESIGN PROFESSIONAL has actual knowledge will be given to CONTRACTOR. Defective Work may be rejected, corrected or accepted as provided in this Article 13.

### **13.04 Uncovering Work**

**A.** If any Work (or the work of others at the Site) is covered contrary to the written request of DESIGN PROFESSIONAL or CITY's Representative, it must, if requested by CITY's Representative, be uncovered for DESIGN PROFESSIONAL's or CITY's Representative's observation and replaced at CONTRACTOR's expense.

**B.** If CITY considers it necessary or advisable that covered Work be observed by DESIGN PROFESSIONAL or CITY's Representative or be inspected or tested by others, CONTRACTOR, at CITY's request, shall uncover, expose or otherwise make available for observation, inspection or testing as may be required, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 16. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefore as provided in Article 16.

### **13.05 CITY May Stop the Work**

**A.** If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, CITY may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of CITY to stop the Work shall not give rise to any duty on the part of CITY to exercise this right for the benefit of CONTRACTOR, any Subcontractor, Supplier, other individual or entity or any surety or employee or agent of any of them.

### **13.06 Correction or Removal of Defective Work**

**A.** If required by CITY, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by either DESIGN PROFESSIONAL or CITY's Representative, remove it and replace it with Work that is not defective. CONTRACTOR shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

### **13.07 Correction Period**

**A.** If within one (1) year after the date of Substantial Completion, or such longer period of time as may be prescribed by Laws or Regulations, by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by CITY or permitted by Laws and Regulations as contemplated in Paragraph 6.10 is found to be defective, CONTRACTOR shall promptly, without cost to CITY and in accordance with CITY's written instructions:

1. correct the repair of damages to such land or areas; or
2. correct such defective Work, or if it has been rejected by CITY, remove it from the Site and replace it with Work that is not defective; and
3. satisfactorily correct or remove and replace any damage to other Work or to the work of others or damage to other lands or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in the event of an emergency where delay by CONTRACTOR would cause serious risk of loss or damage, CITY may have the defective Work corrected or the rejected Work removed and replaced, and all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

**B.** In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

**C.** Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one (1) year, or such longer period of time as may be prescribed within Paragraph 13.07 A, after such correction or removal and replacement has been satisfactorily completed.

**D.** CONTRACTOR's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or waiver of the provisions of any applicable statute of limitation or repose.

### **13.08 Acceptance of Defective Work**

**A.** If, instead of requiring correction or removal and replacement of defective Work, CITY prefers to accept it, CITY may do so. CONTRACTOR shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to CITY's evaluation of and determination to accept such defective Work and shall pay OWNER for the diminished value of the Work. If any such acceptance occurs prior to DESIGN PROFESSIONAL's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work and, due to the diminished value of the Work, CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 16. If the acceptance of defective Work occurs after such recommendation, an appropriate amount shall be paid by CONTRACTOR to CITY.

### **13.09 CITY May Correct Defective Work**

**A.** If CONTRACTOR fails within a reasonable time after written notice from DESIGN PROFESSIONAL or CITY's Representative to correct defective Work or to remove and replace rejected Work as required by CITY in accordance with Paragraph 13.06, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, CITY may, after seven (7) days written notice to CONTRACTOR, correct and remedy any such deficiency.

**B.** CITY shall proceed expeditiously when exercising the rights and remedies under this Paragraph 13.09. In connection with such corrective and remedial action, CITY may exclude CONTRACTOR from all or part of the Site; take possession of all or part of the Work and suspend CONTRACTOR's services related thereto; take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site; and incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow CITY, CITY's Representative, agents and

employees, CITY's other contractors, DESIGN PROFESSIONAL and Consultants access to the Site to enable CITY to exercise the rights and remedies under this Paragraph 13.09.

**C.** All costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by CITY in exercising such rights and remedies will be charged against CONTRACTOR and a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work; and CITY shall be entitled to an appropriate decrease in the Contract Price. If CITY and CONTRACTOR are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 16. Such Claims for costs, losses and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal and replacement of CONTRACTOR's defective or rejected Work.

**D.** CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by CITY of CITY's rights and remedies under Paragraphs 13.06 and 13.09.

## **ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION**

### **14.01 Schedule of Values**

**A.** 01290.02 Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into form 01290.01 Application for Payment acceptable to DESIGN PROFESSIONAL and CITY. Progress payments for Unit Price Work will be based on the number of units completed.

### **14.02 Application for Progress Payments**

#### **A. Application for Payment**

1. At least twenty (20) days before the date stipulated in the Supplementary Conditions for each progress payment (but not more often than once a month), CONTRACTOR shall submit to DESIGN PROFESSIONAL for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated into the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, paid invoice or other documentation warranting that CITY has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect CITY's interest therein, all of which will be subject to CITY's approval.

2. Beginning with the second Application for Payment, each Application shall include:

a. an affidavit of CONTRACTOR stating that all previous progress payments received for the Work have been applied to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment, and

b. a copy of the most recent 00485.01 M/WBE Monthly Utilization Report CONTRACTOR has submitted to the CITY's Human Relations Department.

c. a copy of the most recent 00485.02 Project Workforce Monthly Report and 00485.03 Company-Wide Workforce Monthly Report CONTRACTOR has submitted to the OWNER's Human Relations Department.

d. an update to the approved schedule pursuant to paragraphs 6.04 and 6.05.

3. The amount of retainage with respect to progress payments will be stated in the Supplementary Conditions.

## **B. Review of Applications**

1. DESIGN PROFESSIONAL will, within ten (10) days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to CITY, or return the Application to CONTRACTOR indicating in writing DESIGN PROFESSIONAL's reasons for refusing to recommend payment. In the latter case, CONTRACTOR shall make the necessary corrections and resubmit the Application.

a. After presentation of the Application for Payment to CITY, and if CITY's Representative agrees with DESIGN PROFESSIONAL's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02 B.4) become due and will be paid by CITY to CONTRACTOR, subject to the provisions of Laws or Regulations.

b. No payment shall be approved until the CONTRACTOR has submitted with the Application accompanying documentation as required by the Contract Documents, including, but not limited to, the documentation required by paragraphs 6.04 and 6.05.

2. DESIGN PROFESSIONAL's recommendation of any payment requested in an Application for Payment will constitute a representation by DESIGN PROFESSIONAL to CITY, based on DESIGN PROFESSIONAL's observations of the executed Work as an experienced and qualified DESIGN PROFESSIONAL and on DESIGN PROFESSIONAL's review of the Application for Payment and the accompanying data and schedules, that to the best of DESIGN PROFESSIONAL's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.06, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR being entitled to such payment appear to have been fulfilled in so far as it is DESIGN PROFESSIONAL's responsibility to observe the Work.

3. DESIGN PROFESSIONAL's recommendation of any payment, including final payment, shall not mean that DESIGN PROFESSIONAL is responsible for CONTRACTOR's means, methods, techniques, sequence or procedures of construction, safety precautions and programs incident thereto, or any failure of CONTRACTOR to comply with Laws or Regulations applicable to the furnishing or performance of Work.

4. DESIGN PROFESSIONAL may refuse to recommend the whole or any part of any payment if, in DESIGN PROFESSIONAL's opinion, it would be incorrect to make the representations to CITY referred to in Paragraph 14.02 B.2. DESIGN PROFESSIONAL may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in DESIGN PROFESSIONAL's opinion to protect CITY from loss because:

a. the Work is defective, or completed Work has been damaged requiring correction or replacement;

b. the Contract Price has been reduced by Written Amendment or Change Orders;

c. CITY has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. DESIGN PROFESSIONAL has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.

### **C. Reduction in Payment**

1. CITY may refuse to make payment of the full amount recommended by DESIGN PROFESSIONAL because:

a. Claims have been made by third parties against CITY on account of CONTRACTOR's performance or furnishing of the Work; or

b. Claims have been made by CITY against CONTRACTOR in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to CITY to secure the satisfaction and discharge of such Claims;

c. there are other items entitling CITY to a set-off against the amount recommended; or

d. CITY has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02 B.4.a through c or 15.02 A.1 through 4; but CITY must give CONTRACTOR written notice (with a copy to DESIGN PROFESSIONAL) stating the reasons for such action and promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by CITY and CONTRACTOR, when CONTRACTOR corrects to CITY's satisfaction the reasons for such action; or

e. CITY has made a different determination of the actual quantities and classifications of Unit Price Work.

#### **14.03 CONTRACTOR's Warranty of Title**

**A.** CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated into the Project or not, will pass to CITY no later than the time of payment, free and clear of all Liens.

#### **14.04 Substantial Completion**

**A.** When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify CITY and DESIGN PROFESSIONAL in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that CITY issue a certificate of Substantial Completion. Within a reasonable time thereafter, CITY, together with CONTRACTOR and DESIGN PROFESSIONAL, shall make an inspection of the Work to determine the status of completion. If DESIGN PROFESSIONAL does not consider the Work substantially complete, DESIGN PROFESSIONAL will notify CONTRACTOR and CITY in writing giving the reasons therefore. If DESIGN PROFESSIONAL considers the Work substantially complete, DESIGN PROFESSIONAL will prepare and deliver to CITY a recommended certificate of Substantial Completion that shall establish the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. CITY shall have seven (7) days after receipt of the recommended certificate during which to make written objection to DESIGN PROFESSIONAL as to any provisions of the certificate or attached list. At the time of delivery of the recommended certificate of Substantial Completion, DESIGN PROFESSIONAL will deliver to CITY and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between CITY and CONTRACTOR with respect to security, operation, safety, protection of the Work, maintenance, heat, utilities, insurance and warranties and guarantees.

**B.** CITY shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but CITY shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

#### **14.05 Partial Utilization**

**A.** Use by CITY at CITY's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which CITY, DESIGN PROFESSIONAL and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by CITY for its intended purpose without significant interference with

CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

1. CITY at any time may request CONTRACTOR in writing to permit CITY to use any such part of the Work which CITY believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to CITY and DESIGN PROFESSIONAL that such part of the Work is substantially complete and request CITY to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify CITY and DESIGN PROFESSIONAL in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request CITY to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, CITY, together with CONTRACTOR and DESIGN PROFESSIONAL, shall make an inspection of that part of the Work to determine its status of completion. If DESIGN PROFESSIONAL does not consider that part of the Work to be substantially complete, DESIGN PROFESSIONAL will notify CITY and CONTRACTOR in writing, giving the reasons therefore. If DESIGN PROFESSIONAL considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of Paragraph 5.09 with respect to property insurance.

#### **14.06 Final Inspection**

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, DESIGN PROFESSIONAL will make a final inspection with CITY and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### **14.07 Final Payment**

##### **A. Application for Payment**

1. After CONTRACTOR has completed all corrections required by Paragraph 14.06 to the satisfaction of DESIGN PROFESSIONAL and CITY's Representative and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by Paragraph 5.04, certificates of inspection, marked-up record documents (as provided in Paragraph 6.13) and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation required by the Contract Documents, including but not limited to the evidence of insurance required by Subparagraph 5.04 B.7; and

b. 01290.14 "Contractor Affidavit for Final Payment" from CONTRACTOR and 01290.15 "Subcontractor Affidavit for Final Payment" from all Subcontractors, regardless of tier.

##### **B. Review of Application and Acceptance**

1. If, on the basis of DESIGN PROFESSIONAL's and CITY's Representative's observation of the Work during construction and final inspection, and DESIGN PROFESSIONAL's and CITY's Representative's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, DESIGN PROFESSIONAL and CITY's Representative are satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled,

DESIGN PROFESSIONAL will, within ten (10) days after receipt of the final Application for Payment, indicate in writing DESIGN PROFESSIONAL's and CITY's Representative's recommendation of payment and present the Application to CITY for payment. At the same time DESIGN PROFESSIONAL will also give written notice to CITY and CONTRACTOR that the Work is acceptable subject to the provisions of Paragraph 14.09.

2. Otherwise, DESIGN PROFESSIONAL will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application to DESIGN PROFESSIONAL. After the presentation to CITY of the Application and accompanying documentation, in appropriate form and substance, including applicable federal and state prevailing wage provisions, and with DESIGN PROFESSIONAL's recommendation and notice of acceptability, the amount recommended by DESIGN PROFESSIONAL will become due and will be paid by CITY to CONTRACTOR in accordance with Laws and Regulations.

#### **14.08 Final Completion Delayed**

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if DESIGN PROFESSIONAL so recommends and CITY concurs, CITY shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of DESIGN PROFESSIONAL, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by CITY for Work not fully completed or corrected is less than the retainage stipulated in the Supplementary Conditions, and if Bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to DESIGN PROFESSIONAL with the Application for Payment. Payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

#### **14.09 Waiver of Claims**

A. The making and acceptance of final payment will constitute:

1. a waiver of all claims by CITY against CONTRACTOR, except claims previously made in writing and still unsettled, or claims arising from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against CITY other than those previously made in writing pursuant to Paragraphs 16.02 and 16.03 and still unsettled.

#### **14.10 Completion of Work by CITY**

A. If CITY must complete the Work, all costs and charges incurred by CITY, together with the cost of completing the Work under the Contract, will be deducted from any monies due or which may become due CONTRACTOR. If such expense exceeds the sum which would have been payable under the Contract, then CONTRACTOR and the surety shall be liable and shall pay to CITY the amount of such excess.

### **ARTICLE 15 SUSPENSION OF WORK AND TERMINATION**

#### **15.01 CITY May Suspend Work**

A. Notwithstanding any other provision of this Contract, at any time and without cause, and at its sole and absolute discretion, CITY, may suspend the Work or any portion of the Work by written notice to CONTRACTOR, which will initially fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed in the notice unless the date is changed by a subsequent written notice from CITY. CONTRACTOR may be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly

attributable to any suspension if CONTRACTOR makes a Claim therefore in accordance with Article 16.

**B.** CONTRACTOR will not be allowed an adjustment in the Contract Price or an extension of the Contract Times if CITY suspends the Work because CONTRACTOR's acts or omissions create or cause an emergency that CITY believes affects the safety or protection of persons, the Work, or property at the Site or adjacent thereto. CITY may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been adequately addressed by CONTRACTOR; however, this right of CITY to stop the Work shall not give rise to any duty on the part of CITY to exercise this right for the benefit of CONTRACTOR, any Subcontractor, Supplier, other individual or entity or any surety or employee or agent of any of them.

#### **15.02 CITY May Terminate for Default**

**A.** CONTRACTOR may be deemed in default and CITY may terminate the services of CONTRACTOR upon the occurrence of any one or more of the following events:

1. CONTRACTOR fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under Paragraph 2.06 and 2.07 as adjusted from time to time pursuant to Paragraphs 6.04, 6.05, 12.02 and 12.03);
2. CONTRACTOR abandons the Work or declares its intention to abandon the Work;
3. CONTRACTOR assigns or attempts to assign its rights or obligations under this Contract or any part thereof to any third party without the prior written consent of CITY;
4. CONTRACTOR fails to make prompt payment duly owing to any subcontractor for Work completed in accordance to the Contract Documents or material supplier for materials delivered for incorporation into the Work within thirty (30) calendar days after payment was due;
5. CONTRACTOR fails to achieve the required dates of substantial and final completion;
6. CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;
7. CONTRACTOR disregards the authority of DESIGN PROFESSIONAL or OWNER; or
8. CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents.

**B.** CITY may, after giving CONTRACTOR (and the surety) seven (7) days written notice and to the extent permitted by Laws or Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment and machinery at the Site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid CONTRACTOR but which are stored elsewhere, and finish the Work as CITY may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CITY arising out of or resulting from completing the Work, such excess may be paid to CONTRACTOR. If such costs, losses and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to CITY within fourteen (14) calendar days of CITY'S demand for payment. When exercising any rights or remedies under this Paragraph CITY shall not be required to competitively bid this work unless required by law.

**C.** Where CONTRACTOR's services have been so terminated by CITY, the termination will not affect any rights or remedies of CITY against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by CITY will not release CONTRACTOR from liability.

**D.** If, after a default termination, it is determined that the CONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the CITY. The CITY shall then be liable to CONTRACTOR for only those costs enumerated in paragraph 15.03.

### **15.03 CITY May Terminate for Convenience**

**A.** Notwithstanding any other provision of this Contract, upon seven (7) calendar days written notice to CONTRACTOR, CITY may, at its sole and absolute discretion, without cause and without prejudice to any other right or remedy of CITY, elect to terminate the Contract. In such case, CONTRACTOR shall, with thirty (30) calendar days of receiving notice of termination under this paragraph, submit to CITY its statement of costs and expenses and shall be paid:

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

4. for reasonable expenses directly attributable to termination if approved in advance by CITY.

**B.** CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

**C.** CONTRACTOR waives any costs not submitted to CITY pursuant to paragraph 15.03.A.

**D.** CITY shall, within thirty (30) calendar days after receipt of CONTRACTOR's statement, pay CONTRACTOR all amounts it determines are properly determined.

## **ARTICLE 16 CLAIMS AND DISPUTES**

### **16.01 Definition**

**A.** A Claim is a demand or assertion by the CONTRACTOR seeking, as a matter of right, the adjustment of Contract price and/or times with respect to the terms of the Contract.

### **16.02 Written Notice and Burden of Proof**

**A.** Claims must be made by written notice pursuant to Paragraph 17.01. The written notice shall clearly indicate that the CONTRACTOR is making a claim. The responsibility to substantiate Claims shall rest with the CONTRACTOR. No Claim may be made under this Contract except as provided in this Article.

**B.** Certification of Claim: The written notice of Claim shall include the following statement signed by the CONTRACTOR's representative: "The CONTRACTOR certifies that all statements made and the facts set out in this claim are true and correct and that no false records have been submitted in support of this claim." **Strict compliance with this paragraph shall be a condition precedent to the creation, existence or validity of any Claim.**

### **16.03 Time Limits on Claims**

**A.** The CONTRACTOR must give notice to the CITY within fourteen (14) calendar days after the denial of a request for or failure to reach an agreement on a change in Contract Price and/or change in Contract Time pursuant to Article 11 and Article 12 respectively. After the fourteen (14) day period for making Claims has expired, the Claim shall be considered waived.

**B.** The CONTRACTOR shall submit the Claim to the CITY's Representative.

#### **16.04 Continuing Contract Performance**

**A.** Pending final resolution of a Claim, unless otherwise agreed in writing, the CONTRACTOR shall proceed diligently with performance of the Work and the CITY shall continue to make payments in accordance with the Contract Documents. The CITY may, but is not obligated to, notify the Surety of the nature and amount of the Claim.

#### **16.05 Injury or Damage to Person or Property**

**A.** If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts that party is legally liable, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding thirty (30) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter.

#### **16.06 Initial Resolution of Claims and Disputes**

**A.** After the CONTRACTOR has submitted the Claim to the CITY's Representative, the CITY'S Representative and CONTRACTOR'S Representative shall conduct a settlement conference within fourteen (14) calendar days from the date of receipt of the Claim. If the Claim is not settled within seven (7) calendar days following the date of the settlement conference, the CITY'S Representative and the CONTRACTOR's Representative shall state, in writing, following the conclusion of the seven (7) calendar day period, their respective position as to the matters in dispute.

**B.** The CITY'S and CONTRACTOR'S statement of positions shall state all known factual grounds for each party's position. If the dispute remains unresolved at the end of the seven (7) calendar days from submission of the parties' written position statements, the CONTRACTOR shall have the right to proceed with the pursuit of Claims pursuant to paragraph 16.07.

**C.** If a Claim has been resolved, the OWNER will prepare or obtain appropriate documentation.

#### **16.07 Final Resolution of Claims and Disputes**

**A.** All administrative procedures set forth in this contract must first be exhausted before suit is filed.

**B.** If the CITY'S Representative and the CONTRACTOR'S Representative are unable to resolve the dispute pursuant to 16.06, the parties must submit their statements of position to the Director, who shall review the Claim and make a decision within fourteen (14) calendar days.

**C.** Absent fraud, gross mistake or bad faith, the Director's decision shall be final and binding on CITY and CONTRACTOR within fourteen (14) calendar days after issuance. The CONTRACTOR shall give written notice to the CITY stating its intent to submit its Claim to a court of law pursuant to paragraph 17.05.A. within thirty (30) calendar days after notice of Director's decision.

**D.** The time frames for the Director's decision and for CONTRACTOR'S written notice of intent may be tolled by participation in voluntary mediation. Mediator selection and the procedures to be employed in voluntary mediation shall be mutually acceptable to the parties. Costs of the mediator shall be shared equally among the parties participating in the mediation. In no event shall any time frame be tolled more than 30 days for mediation. However, mediation may be employed at any time at the discretion and mutual agreement of the parties.

**E.** If the dispute is not resolved during voluntary mediation, The CONTRACTOR agrees that it will file no suit based on facts or evidentiary materials that were not presented for consideration to the CITY during the mediation process or of which the CONTRACTOR had knowledge and failed to present during the administrative procedures.

### **ARTICLE 17 MISCELLANEOUS**

#### **17.01 Giving Notice**

**A.** Whenever any provision of the Contract Documents requires the giving of written notice, it will be given by personal delivery, by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice or by confirmed electronic facsimile transmission. Notice is effective on the date of personal delivery, deposit of registered or certified mail, postage prepaid, or confirmed electronic facsimile transmission.

#### **17.02 Computation of Times**

**A.** When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last calendar day of such period. If the last day of such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

#### **17.03 Cumulative Remedies**

**A.** The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR and all of the rights and remedies available to CITY and DESIGN PROFESSIONAL hereunder are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

#### **17.04 Survival of Obligations**

**A.** All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract.

#### **17.05 Controlling Law**

**A.** This Contract shall be construed and governed in accordance with the laws of the State of Missouri without giving effect to Missouri's choice of law provisions. The CITY and CONTRACTOR: (1) shall submit exclusively to the jurisdiction of the state and federal courts located in Jackson County, Missouri and no other; (2) shall waive any and all objections to jurisdiction and venue; and (3) shall not raise forum non conveniens as an objection to the location of any litigation.



## SUPPLEMENTARY CONDITIONS

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

These Supplementary Conditions amend or supplement the General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

**SC-2.03 A.** Article 2, Paragraph 2.03, Copies of Documents, is amended by deleting Paragraph 2.03 A and replacing it with the following:

- A. CITY shall furnish to CONTRACTOR up to one (1) copy of the Drawings and Specifications, including Addenda.

**SC- 5.01 A.** Article 5, Paragraph 5.01, Performance, Payment and Other Bonds, Subparagraph A, second sentence, is revised as follows:

These Bonds shall remain in effect at least until **Two (2) years** after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents.

**SC-5.03 A.** Article 5, Paragraph 5.03 Certificates of Insurance, Subparagraph A is amended by adding the following Subparagraph 1:

1. ***CONTRACTOR shall obtain evidence that all Subcontractors have in force the required coverage in the amounts required by these Contract Documents, and evidence that each is current on its unemployment insurance payments before Subcontractors begin Work at the Site. CONTRACTOR shall retain such evidence in its files and make available to CITY within ten (10) days after written request.***

**SC-5.04 B.1.** Article 5, Paragraph 5.04, CONTRACTOR's Liability Insurance, Subparagraph B.1 is amended as follows:

With respect to insurance required by Paragraphs 5.04 A.3 through 5.04 A.5, the following additional individuals or entities shall be listed as additional insureds:

With respect to Commercial Automobile Liability Insurance and Commercial General Liability Insurance, the Missouri Department of Transportation (MoDOT), the Missouri Highways and Transportation Commission (MHTC) and each of their respective employees shall be listed as additional insureds.

**SC-5.06 A.** Article 5, Paragraph 5.06, Property Insurance, Paragraph A, is amended by adding the following after the first sentence:

Property Insurance on the Work at the Site shall be written with a deductible amount not to exceed \$10,000.00.

**SC-6.06 A.1** Article 6, Paragraph 6.06 Substitutes and "Or-Equal" Items, Paragraph A is amended by adding the following at the end of Paragraph A.1:

Proposed "or-equal" items must be submitted to CITY at least **ten 10 days** prior to Bid date at the following address:

Kansas City Water Department  
4800 E 63<sup>rd</sup> street  
Kansas City, Missouri 64130  
Attn: John Reddy, Project Manager

Only Bidders may submit proposed "or-equal" items and such items must require no change in related Work. Acceptance by CITY of any proposed "or-equal" items will be made by Addendum only.

**SC-6.06 A.2.** Article 6, Paragraph 6.06 Substitutes and "Or-Equal" Items, Paragraph A is amended by adding the following at the end of Paragraph A.2:

Proposed substitute items must be submitted to CITY's Representative not later than 14 days prior to the time the item is to be incorporated into the Work. Only CONTRACTOR may submit proposed substitute items, and such items must be submitted to CITY's Representative on the standard City form 01630 - Substitution Request. Acceptance by CITY of any proposed substitute item will be made by Change Order.

**SC-6.07 J** Article 6, Paragraph 6.07, concerning Subcontractors, Suppliers and Others, is supplemented by adding Subparagraph J as follows:

CONTRACTOR shall perform with its own organization Work amounting to not less than 25% of the total Contract Price. "Its own organization" shall be construed to include only workers employed and paid by the CONTRACTOR and equipment owned or rented by the CONTRACTOR, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the CONTRACTOR.

**SC-6.10.** Article 6, Paragraph 6.10, Compliance with Laws and Regulations, is amended by adding the following new Subparagraphs immediately following Subparagraph 6.10 I 2:

a. CONTRACTOR will be required to comply with wage rates as follows:

County – Cass, Clay, Jackson, Platte or Ray

Work Type: State – Heavy

**SC-6.10.** Article 6, Paragraph 6.10, Compliance with Laws and Regulations, is amended by adding the following new Subparagraph 6.10 S:

1. "Resident Laborers" means laborers who have been residents of the State of Missouri for at least thirty days and who intend to remain Missouri residents, and residents of Nonrestrictive States.

2. "Nonrestrictive States" means states identified by the Missouri Department of Labor and Industrial Relations Division of Labor Standards that have not enacted state laws restricting Missouri laborers from working on public works projects. A list of Nonrestrictive States can be found on the Division web site at <http://www.dolir.mo.gov/ls/index.htm>.

3. A period of Excessive Unemployment is declared when the Missouri Department of Labor and Industrial Relations Division of Labor Standards provides notice of such declaration. When in effect, notice will be provided on the Division web site at <http://www.dolir.mo.gov/ls/index.htm>. It is CONTRACTOR's obligation to determine whether a period of Excessive Unemployment is in effect when this Contract is let.

4. CONTRACTOR agrees to follow the provisions of Section 290.560 - 290.575 RSMo and agrees that if a period of Excessive Unemployment has been declared at any point during the term of this Contract, it will employ and require all Subcontractors of whatever tier to employ only Resident Laborers for the Work to be performed under this CONTRACT. Provided, however, CONTRACTOR may use laborers who are not Resident Laborers when Resident Laborers are not available or are incapable of performing the particular type of work involved if CONTRACTOR so certifies in writing to CITY and CITY issues a written approval. This provision does not apply to regularly employed nonresident executive, supervisory or technical employees.

Article 6, Paragraph 6.10, Compliance with Laws and Regulations, is amended by adding the following new Subparagraph 6.10 T:

Contract Information Management System. CONTRACTOR shall comply with CITY's Contract Information Management System requirements. CONTRACTOR shall use CITY's Internet web based Contract Information Management System/Project Management Communications Tool provided by CITY and protocols included in that software during the term of this Contract. CONTRACTOR shall maintain user applications to CITY's provided system for all personnel, subcontractors or suppliers as applicable.

**SC-6.11.** Article 6, Paragraph 6.11, Taxes, is amended by adding the following sentence to Subparagraph 6.11 B:

B. Tax Compliance. The following subparagraphs apply if the Contract is over \$160,000.00.

**SC-9.02 A.** Article 9, Paragraph 9.02, Resident Project Representative, Subparagraph A is supplemented as follows:

The responsibilities, authority and limitations of authority of DESIGN PROFESSIONAL's resident Project representative as stated in Paragraph 9.08 are modified as follows:

**SC-9.08 E.** Article 9, Paragraph 9.08, Limitations on DESIGN PROFESSIONAL's Authority and Responsibilities, Subparagraph E is supplemented as follows:

DESIGN PROFESSIONAL's Consultant(s), resident Project representative and assistant(s) to the resident Project representative are the following:

Consultant(s): Burns and McDonnell.

Resident Project representative: TBD.

Assistant(s) to the resident Project representative: TBD.

**SC-12.01** Article 12, Paragraph 12.01, Time of the Essence is amended by adding the following new Subparagraphs immediately following Subparagraph 12.01 A:

B. Starting and Completion

1. The Work to be performed under this Contract shall begin on the date specified in the written Notice to Proceed issued by the Director of Water Services and the Work shall be substantially complete, in accordance with Paragraph 14.04, within **548 Calendar Days** thereafter. Once the Work starts, CONTRACTOR shall continuously pursue completion of the Work.
2. The Work shall be completed and ready for final payment in accordance with Paragraph 14.07 within **60 Calendar Days** after the date of Substantial Completion of the Work.

C. Liquidated Damages

1. If the Work is not substantially completed, in accordance with Paragraph 14.04, within the period stated in Paragraph 12.01 B.1, CONTRACTOR shall pay to CITY the amount of **One Thousand Dollars and No/100 (\$1,000.00)** as liquidated damages and not as a penalty for each Calendar Day until the Work is substantially complete. The amount of liquidated damages shall be deducted from any payments due or to become due CONTRACTOR.
2. If the Work is not completed and ready for final payment in accordance with Paragraph 14.07, within the period stated in Paragraph 12.01 B.2, CONTRACTOR shall pay to CITY the amount of **Five Hundred Dollars and No/100 (\$500.00)** as liquidated damages and not as a penalty for each Calendar Day until the Work is completed and ready for final payment. The amount of liquidated damages shall be deducted from any payments due or to become due CONTRACTOR.

**SC-13.07** Article 13, Paragraph 13.07, Correction Period, Subparagraph A is amended as follows:

The correction period set forth in Paragraph 13.07 A shall be two (2) years instead of one (1) year, which longer period of time shall also be applicable to the correction period set forth in Paragraph 13.07 C. All other provisions of Paragraph 13.07 remain unchanged except as necessary to accommodate the revised length of the correction period.

**SC-14.02 A.** Article 14, Paragraph 14.02, Application for Progress Payments, Subparagraph A is amended by deleting Item 3 and adding the following:

3. CITY shall make payments to CONTRACTOR on a monthly basis. Payments to CONTRACTOR will be made on the basis of ninety-five percent (95%) of the value of the Work satisfactorily completed plus ninety-five percent (95%) of the value of properly stored and insured, unused materials on hand on the Site of the Work. CITY shall retain five percent (5%) of each partial payment until completion and acceptance of the Work covered by the Contract and final payment is due. All Work covered by a payment becomes CITY's property, provided that the Work paid for remains the sole responsibility of CONTRACTOR until all terms and conditions of the Contract have been met.

**SC-14.04.** Article 14, Paragraph 14.04, Substantial Completion, Subparagraph A is supplemented as follows:

- A. To be considered substantially complete, the following items of the Work must be operational and ready for CITY's continuous use as intended:
  1. Elevated tank capable of storing and supplying water.
  2. All painting and coatings associated with the project.
  3. All mechanical work including all ductwork, piping, valves, and appurtenances.
  4. All electrical, lighting, instrumentation, and controls work.
  5. All testing work shall be complete, including all acceptance and demonstration testing.
  6. Receipt of all Final Operations and Maintenance Manuals and Final Shop Drawings.
  7. All other Work associated with the new facilities unless otherwise specified or acceptable to CITY or DESIGN PROFESSIONAL.

**SC-14.05** Article 14, Paragraph 14.05, Partial Utilization is amended by adding the following new Subparagraph A.3. immediately following Subparagraph 14.05 A.2:

3. CITY at any time may make a written request to CONTRACTOR to permit CITY to take over operation of any part of the Work although it is not substantially complete. A copy of the request will be sent to DESIGN PROFESSIONAL, and within a reasonable time thereafter CITY, CONTRACTOR and DESIGN PROFESSIONAL shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not make written objection to CITY and DESIGN PROFESSIONAL that such part of the Work is not ready for separate operation by CITY, DESIGN PROFESSIONAL will finalize the list of items to be completed or corrected and will deliver such lists to CITY and CONTRACTOR. DESIGN PROFESSIONAL will also make a written recommendation as to the division of responsibilities pending final payment between CITY and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work, which recommendation will become binding upon CITY and CONTRACTOR at the time when CITY takes over such operation (unless they shall have otherwise agreed in writing and so informed DESIGN PROFESSIONAL). During such operation and prior to Substantial Completion of such part of the Work, CITY shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

## SECTION 00830

### PREVAILING WAGE

1. Annual Wage Order No. 29
2. **0830.03 Division of Labor Standards Rules & Regulations** are incorporated into and made part of this Contract and are available at <http://s1.sos.mo.gov/cmsimages/adrules/csr/current/8csr/8c30-3.pdf>.

# Missouri

## Division of Labor Standards

### WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

## Annual Wage Order No. 29

Section 048  
**JACKSON COUNTY**

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

Original Signed by \_\_\_\_\_

Todd Smith, Director  
Division of Labor Standards

Filed With Secretary of State: \_\_\_\_\_ **March 10, 2022**

Last Date Objections May Be Filed: **April 11, 2022**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	\$67.05
Boilermaker	\$37.33*
Bricklayer	\$59.20
Carpenter	\$60.21
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	\$54.35
Plasterer	
Communications Technician	\$58.66
Electrician (Inside Wireman)	\$66.21
Electrician Outside Lineman	\$64.01
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	\$37.33*
Glazier	\$56.84
Ironworker	\$66.35
Laborer	\$49.04
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	\$54.39
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	\$60.71
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$50.15
Plumber	\$74.12
Pipe Fitter	
Roofer	\$57.93
Sheet Metal Worker	\$71.70
Sprinkler Fitter	\$61.32
Truck Driver	\$47.50
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

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

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

Heavy Construction Rates for  
JACKSON County

Section 048

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$60.95
Millwright	
Pile Driver	
Electrician (Outside Lineman)	\$84.43
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$49.28
General Laborer	
Skilled Laborer	
Operating Engineer	\$58.78
Group I	
Group II	
Group III	
Group IV	
Truck Driver	\$50.64
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

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

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

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

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

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

# 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.



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# Rules of Department of Labor and Industrial Relations

## Division 30—Division of Labor Standards Chapter 3—Prevailing Wage Law Rules

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**Title 8—DEPARTMENT OF  
LABOR AND  
INDUSTRIAL RELATIONS**

**Division 30—Division of  
Labor Standards**

**Chapter 3—Prevailing Wage Law Rules**

**8 CSR 30-3.010 Applicable Wage Rates for  
Public Works Projects**

*PURPOSE: This rule sets forth applicable wage requirements relative to work performed by workers on public funded projects.*

- (1) All public bodies of Missouri, before advertising for bids or undertaking construction work, must obtain from the department an annual wage order which sets forth the applicable hourly rate of wages (the prevailing wage or the public works contracting minimum wage as provided in section 290.257) in the locality. The rates so determined shall be incorporated in the contract specifications and made a part of those specifications, except that construction contracts of the State Highway and Transportation Commission need not list specific wage rates to apply, but may refer to the wage rates contained in the appropriate General Wage Orders issued by the department, as applicable.
- (2) Request for annual wage orders shall be initiated at least ten (10) calendar days before advertisement of the specifications for the contract for which the determination is sought. An exception from this provision will be made by the department only upon a proper showing of extenuating circumstances. The department has prepared and printed Form No. PW-3 for use in making a request. The form may be secured by writing Division of Labor Standards, PO Box 449, Jefferson City, MO 65102 or by visiting the following website: [https://labor.mo.gov/sites/labor/files/pubs\\_for\\_ms/PW-3-AI.pdf](https://labor.mo.gov/sites/labor/files/pubs_for_ms/PW-3-AI.pdf).
- (3) A project notification form PW-2 must be filed for each separate project by the public body, except the State Highways and Transportation Commission, which will be furnished prevailing wage determinations under General Wage Orders.
- (4) The annual wage order issued by the department contains the current applicable wage rates in the locality at the time the annual wage order is issued. Hours worked during the calendar year are used to set the prevailing wage rates in the annual wage order issued in March of the following year. The department will consider hours submitted for use in its initial determination of the prevailing wage rates to be included in a particular year's wage order only if those hours are received from a contractor, by either paper submission on a form provided by the department or in electronic format, no later than January 31 of that year. Handwritten submissions will not be accepted. For purposes of submitting reportable hours, the term "contractor" shall include a "subcontractor." The department will not include the following hours in the calculation of the annual wage order:
- (A) Hours not readily identifiable as being submitted by a contractor;
- (B) Hours worked by federally-registered apprentices or entry-level workers;
- (C) Hours worked on residential construction projects.
- (5) Section 290.262.8, RSMo, provides that the annual wage order for a particular occupational title may be altered once each year with an incremental increase. A public body shall specify in the call for bids for each contract the applicable hourly rate of wages in the locality for each type of worker as set forth in the annual wage order or any replacement page(s) identifying the annual incremental increase issued by the department for the prevailing hourly rate of wages. The wage rates attached to, and made a part of, the call for bids for a contract shall remain in effect for the duration of that particular contract.
- (6) It should be understood by all interested parties that the certified applicable wage rates determined by the department are minimum wage rates. The contractor may not pay less than the applicable wage rates determined by the department for the project or contract awarded to him/her as set forth in the proposal on which s/he submitted his/her bid. Employees are free to bargain for a higher rate of pay and employers are free to pay a higher rate of pay.
- (7) Each month the successful bid contractors shall submit certified copies of their current payrolls to the contracting public body. The public body, upon receipt of the payrolls on a project, shall keep the payrolls on file for a period of one (1) year from the date of submission of the final payrolls by the contractor. Payroll records shall set out accurately and completely, for each individual, the following information which shall be specifically recorded by occupational title classification and type of worker (journeyman, entry-level worker, or federally-registered apprentice): name and address of each worker, rate of pay, daily and weekly number of hours worked, deduction made, and actual wages paid. The payroll records shall be available at all times for inspection by authorized representatives of the Department of Labor and Industrial Relations.
- (8) The public body shall make examinations of the payrolls and other records of each contractor or subcontractor as may be necessary to assure compliance with the provisions of the law. In connection with those examinations, particular attention should be given to the correctness of classifications and any disproportionate employment of any workers. The examinations shall be of a frequency that may be necessary to assure conformity with the provisions of the law. An examination shall be made after the project has been substantially completed but prior to the acceptance of the affidavit as required by section 290.290, RSMo. If any violation of sections 290.210–290.580, RSMo, is discovered by the inspecting public body, it is their duty under section 290.250, RSMo, to withhold and retain from payments to the contractor all sums and amounts due and owing as a result of any violation. Any violation shall be immediately reported to the Division of Labor Standards at PO Box 449, Jefferson City, MO 65102 or by telephone or electronically.

*AUTHORITY: section 290.240.2, RSMo Supp. 2018.\* Original rule filed Dec. 18, 1975, effective Dec. 28, 1975. Amended: Filed July 24, 1984, effective Nov. 11, 1984. Amended: Filed Aug. 24, 1990, effective April 29, 1991. Emergency amendment filed Sept. 15, 1994, effective Sept. 25, 1994, expired Jan. 13, 1995. Emergency amendment filed Dec. 9, 1994, effective Jan. 14, 1995, expired May 13, 1995. Emergency amendment filed May 1, 1995, effective May 14, 1995, expired Sept. 10, 1995. Amended: Filed May 1, 1995, effective Aug. 30, 1995. Amended: Filed July 17, 1995, effective Jan. 30, 1996. Amended: Filed March 27, 2000, effective Oct. 30, 2000. Amended: Filed Nov. 9, 2000, effective May 30, 2001. Emergency amendment filed Nov. 10, 2015, effective Nov. 20, 2015, expired May 17, 2016. Amended: Filed Nov. 10, 2015, effective April 30, 2016. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

*\*Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

*Woodman Engineering Company v. Butler, 442 SW2d 83 (Mo. App. 1969). The function of reviewing court in prevailing wage cases is to decide if the determination of the commission was authorized by law and was supported by competent and substantial evidence upon the whole record. A decision clearly contrary to the evidence should be set aside. However, all pertinent evidence and factors must be considered in determining the applicable prevailing wage.*



*City of Joplin v. Industrial Commission of Missouri*, 329 SW2d 687 (Mo. En Banc 1959). Administrative agencies do not have authority to determine constitutionality of legislation. Determination of prevailing wage earnings by commission must be based upon all current relevant factors.

#### 8 CSR 30-3.020 Definitions

**PURPOSE:** This rule sets forth the definition of certain terms for purposes of issuance and use of annual and general wage orders under the Prevailing Wage Law, sections 290.210–290.580, RSMo and the rules in this chapter.

(1) The term construction of public works generally includes construction activity as distinguished from manufacturing, furnishing of materials or servicing and maintenance work. The term includes, without limitation, the construction of buildings, structures and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, dredging, shoring, rehabilitation and reactivation of plants, scaffolding, drilling, blasting, excavating, clearing and landscaping. The manufacture or furnishing of materials, articles, supplies or equipment is not construction of public works within the meaning of the Prevailing Wage Law unless conducted in connection with and at the site of construction. The term construction of public works also means all work done in the construction or development of a public works project, including without limitation, altering, remodeling, demolishing existing structures, installation on the site of the construction of items fabricated off-site, painting and decorating, the transporting of materials and supplies to or from the site of the construction by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies or equipment on the site of the construction by persons employed by the contractor or subcontractor.

(2) The term site of the building or construction job means the physical place(s) where the public works are to be constructed, and also means other adjacent or nearby property used by the contractor or subcontractor in that construction which can reasonably be said to be included in the site. Except as otherwise provided in this section, fabrication plants, mobile factories, batch plants, borrow pits, job headquarters, tool yards and the like, are part of the site of the building or con-

struction job provided they are dedicated in a substantial degree to the performance of the public works project, and are so located in proximity to the actual construction location that it would be reasonable to include them. The dedication of seventy-five percent (75%) or more of the output of a fabrication plant, batch plant and the like, to the public works project raises a rebuttable presumption that the facility is part of the site of the building or construction job. The presumption may be rebutted by evidence showing that the facility was established for other legitimate commercial purposes that make the facility useful well after the public works project has been completed. Not included in the site of the building or construction job are permanent home offices, branch plant establishments, fabrication plants and tool yards of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular public works project. In addition, fabrication plants, batch plants, borrow pits, job headquarters, tool yards and the like, of a commercial supplier or materialman which are established by a supplier of materials for the project before opening of bids and not on the project site are not included in the site of the building or construction job. The permanent, previously established facilities are not a part of the site of the building or construction job, even where the operations for a period of time may be dedicated exclusively, or nearly so, to the performance of a public works project.

**AUTHORITY:** section 290.240, RSMo 1994.\* Original rule filed Aug. 24, 1990, effective April 29, 1991. Amended: Filed July 17, 1995, effective Jan. 30, 1996.

\*Original authority: 290.240, RSMo 1957, amended 1959.

#### 8 CSR 30-3.030 Apprentices and Entry-Level Workers

**PURPOSE:** This rule sets forth the requirements for the payment of wages to apprentices and entry-level workers employed on public works subject to the Prevailing Wage Law.

**PUBLISHER'S NOTE:** The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference mate-

rial. The entire text of the rule is printed here.

(1) Journeymen's rate of pay shall be paid to all workers employed on public works construction except entry-level workers or apprentices registered and participating in apprentice programs registered with the United States Department of Labor, Employment and Training Administration; and apprentices registered and participating in programs certified by the Secretary of the United States Department of Transportation as promoting equal opportunity in connection with federal-aid highway construction programs. Such workers shall be paid not less than fifty percent (50%) of the applicable wage rate for a journeyman worker under the appropriate occupational title for a specific locality. In calculating the applicable wage rate for a journeyman worker, fringe benefits shall be included.

(2) As set forth in section 290.235, "on-the-job training workers" are defined as follows:

(A) "Federally-registered apprentices" – Workers participating in programs administered by the United States Department of Labor and subject to their specific requirements (See 29 U.S.C. section 50 and 29 C.F.R. 29) and workers participating in programs administered by the United States Department of Transportation and subject to their specific requirements. (See 23 U.S.C. section 113 and 23 C.F.R. 230); and

(B) "Entry-level workers"—Any worker who is not a journeyman and who is not otherwise enrolled in a federally-registered apprenticeship program but is participating in an on-the-job training program provided by the contractor for whom they perform work on a public construction project.

(3) Workers employed on federal-aid highway construction projects may be paid at an apprentice rate of pay if enrolled in an apprenticeship or skill training program which has been certified by the Secretary of the United States Department of Transportation pursuant to 23 U.S.C. 113. In the event the Secretary of Transportation withdraws approval of a program, the contractor will no longer be permitted to pay workers less than the applicable predetermined rate for the work performed until an acceptable program is approved.

**AUTHORITY:** section 290.240, RSMo Supp. 2018.\* Original rule filed Aug. 24, 1990, effective April 29, 1991. Amended: Filed July 17, 1995, effective Jan. 30, 1996. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended:



Filed Nov. 21, 2018, effective July 30, 2019.

\*Original authority: 290.240, RSMo 1957, amended 1969, 2018.

### 8 CSR 30-3.040 Classifications of Construction Work

**PURPOSE:** *The Department of Labor and Industrial Relations has the responsibility under section 290.260, RSMo to determine the prevailing hourly rate of wages to be paid to workers engaged in work of a similar character. This rule establishes classifications of construction work for the department to use in determining the prevailing hourly rate of wages for work of a similar character.*

(1) All public works construction, for which the prevailing hourly rate of wages or the public works contracting minimum wage of workers are to be determined, shall be classified as either—

- (A) Building construction; or
- (B) Highway and heavy construction.

(2) Building construction shall mean the following:

(A) Building structures, including modification, additions or repairs, or both, to be used for shelter, protection, comfort, convenience, entertainment or recreation, or for protection of people or equipment;

(B) Buildings at an airport project, such as terminal buildings, freight buildings, and any other construction necessary for the operation of the airport facilities;

(C) Stadiums, athletic fields, dressing rooms, bleachers, and all other buildings needed in connection with an athletic or entertainment facility;

(D) Entire buildings that are built above-ground in connection with highway, subway, or tunnel projects, such as tool stations or housing for mechanical equipment;

(E) Excavation for the building itself, including backfilling inside and outside the building;

(F) Storm and sanitary sewers inside the building and to the curb line;

(G) Work in connection with telephone, electrical, water, oil, gas, or fuel lines, or other utility or communication lines inside a building and to the curb line;

(H) Sidewalks other than those that are poured in connection with a street or road project;

(I) Driveways that are built to serve a building;

(J) Parking lots connected to a building and all structures built as parking facilities;

(K) Retaining walls built in conjunction

with a building project;

(L) Demolition of a building(s) as part of the site preparation for new building construction;

(M) Landscaping of building sites or the planting of all shrubbery that is incidental to building construction as defined in section (2); and

(N) Work on water and wastewater treatment plants within the fence line.

(3) Highway and heavy construction shall mean the following:

(A) Work in connection with roads, streets, parkways, alleys and highways including, but not limited to, grading, paving, curbing, signs, fences, guard rails, bridges, lighting, retaining walls, and landscaping;

(B) Work on viaducts, overpasses, underpasses, drainage projects, aqueducts, irrigation projects, flood control projects, reclamation projects, reservoir filtration and supply projects, water power, duct lines, distribution lines, pipe lines, locks, dikes, levees, revetments projects, excluding work specifically defined as building construction;

(C) Work in connection with underground construction on tunnels and shafts;

(D) Railroad work in its entirety, including elevated railroads;

(E) Main and side sewers;

(F) Work in connection with airports, such as runways, roads, and streets, but excluding that which is listed as building construction;

(G) Work in connection with telephone, electrical, water, oil, gas, or fuel lines, or any other utility or communication lines from the curb line;

(H) Sidewalks when poured incidental to a street or road project;

(I) Parking lots not incidental to a building construction project; and

(J) Demolition of all buildings as part of site preparation for any highway and heavy construction as is otherwise defined in section (3).

**AUTHORITY:** *section 290.240, RSMo Supp. 2018.\* Original rule filed Aug. 24, 1990, effective April 29, 1991. Amended: Filed July 17, 1995, effective Jan. 30, 1996. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

\*Original authority: 290.240, RSMo 1957, amended 1969, 2018.

### 8 CSR 30-3.050 Posting of Prevailing Wage Rates

**PURPOSE:** *This rule sets forth the require-*

*ments for the posting of prevailing wage rates on public works projects subject to the Prevailing Wage Law.*

(1) Contractors and subcontractors engaged in public works projects shall post the applicable hourly rate of wages (the prevailing wage or the public works contracting minimum wage as provided in section 290.257, excluding rates on projects for which the engineer's estimate or the bid accepted by the public body for the total project cost is less than seventy-five thousand dollars (\$75,000)) in a dry, accessible place within the field office at the site of the building or construction job. On public works projects for which no field office is needed or established, such as road construction, sewer lines, pipelines, and the like, a contractor/subcontractor may post the applicable hourly rates of wages at the contractor/subcontractor's local office or batch plant, so long as the contractor/subcontractor provides a copy of the prevailing hourly wage rates to any worker upon request. Applicable hourly wage rates must be posted and maintained in a clearly legible condition for the duration of the public works project as provided by law.

**AUTHORITY:** *section 290.240, RSMo Supp. 2018.\* Original rule filed Aug. 24, 1990, effective April 29, 1991. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

\*Original authority: 290.240, RSMo 1957, amended 1969, 2018.

### 8 CSR 30-3.060 Occupational Titles of Work Descriptions

**PURPOSE:** *The Department of Labor and Industrial Relations is required to determine the prevailing hourly rate of wages to be paid to each worker engaged in construction on a public works project, relative to the type of work performed by each worker. This rule describes by occupational title the type of work performed in the construction of a public works project in Missouri and sets forth the procedures to be followed in identifying each occupational title utilized on a public works project.*

(1) Each occupational title defines by name the type of work performed in the construction of a public works project. The description of work designated for a particular occupational title is not intended to be jurisdictional in scope or nature, and is not to be construed as limiting or prohibiting workers from engaging in construction work falling within



several occupational titles.

(2) Each occupational title of work description shall be based upon the particular nature of the work performed, with consideration given to those trades, occupations or work generally considered within the construction industry as constituting a distinct classification of work. In determining occupational titles and scope of work definitions, the department shall consider the following:

(A) Collective bargaining agreements;

(B) *Dictionary of Occupational Titles*, as published by the United States Department of Labor; and

(C) Opinions of experts from organized labor and the opinions of contractors and contractor associations as they relate to the custom and usage applicable to the construction industry in Missouri.

(3) Interested parties who wish to submit wage information to be used in establishing the prevailing hourly rate of wages for a particular class or type of work are required to identify the work according to the applicable occupational title of work description set forth in this rule. Hours of work reported by a contractor or subcontractor to the department shall not be used to establish the prevailing hourly rate of wages if the party submitting the hours of work fails to identify the work under one of the occupational titles included in section 290.257.

(4) Any question as to the proper classification of work should be resolved before the work in question is commenced. Interested parties are encouraged to contact the Prevailing Wage Section of the Division of Labor Standards for an interpretation of these rules and for a determination of the appropriate occupational title of work description, relative to the class or type of work to be performed.

(5) The occupational titles and work descriptions for each type or class of work contained herein are valid throughout the entire state of Missouri. Through an objection to a wage order, an interested party may assert that any given description of work, as stated within this rule, does not apply to a specific occupational title(s) and that a different work description should apply to that occupational title(s). The interested party shall have the burden of proving by a preponderance of the evidence the inapplicability of the description of work within that particular occupational title, but shall be afforded the opportunity to do so in a hearing on an objection to the wage order before the Labor and Industrial Relations Commission.

(6) Occupational titles of work descriptions may be obtained from the department by written request to the director of the Division of Labor Standards, PO Box 449, Jefferson City, MO 65102 or by visiting the following website: <https://labor.mo.gov/DLS/PrevailingWage/pwContractors>.

(7) The occupational titles of work descriptions set forth here are as follows:

(A) Asbestos Worker—Applies to workers who apply insulation materials to mechanical systems to reduce loss or absorption of heat, prevent moisture condensation, and to deaden sound and prevent vibration. The workers remove all insulation materials from mechanical systems unless the mechanical system is being scrapped. The work falling within this occupational title of work description includes:

1. The preparation, including the building of enclosures and hanging polyurethane, and physical distribution on the job site of asbestos, cork, plastic, magnesia or similar materials, or other materials used as a substitute, and used as thermal insulation. The manufacture, fabrication, assembling, molding, handling, erection, spraying, pouring, making, hanging, application, adjusting, alteration, repairing, dismantling, reconditioning, corrosion control, and testing of heat or frost insulation, such as asbestos, cork, mineral wall, infusorial earth, mercerized silk, flax, fiber, fire felt, asbestos paper, asbestos curtain, asbestos millboard, fibrous glass, foam glass, styrofoam, polyurethane, polystyrene, metals, plastics, fibrous matter, roving, and resins, and the erection of scaffolding up to fourteen feet (14'), working platform;

2. The covering, including encapsulation, of boilers, tanks, refrigeration units, evaporators, turbines, fittings, valves, ducts, flues, vats, equipment, hot and cold pipes, or any other hot or cold surfaces with the insulation materials listed in this rule, used for the purpose of thermal insulation, fire stoppage, fireproofing, radiator protection, sound deadeners, and the lagging (covering) on piping; and

3. The removal of all insulation materials from mechanical systems, unless the mechanical system is being scrapped, whether they contain asbestos or not (pipes, boilers, ducts, flues, breechings). All cleanup required in connection with this work, shall include the sealing, labeling, and dropping of scrap material into the appropriate containers. (After drop, final disposal is considered to be the class or type of work falling within the occupational title of work description for second semiskilled laborer.);

(B) Boilermaker—Applies to workers who assemble, erect, and repair boilers, tanks,

vats, and pressure vessels according to blueprint specifications, using handtools, portable power tools, and equipment. The work falling within this occupational title of work description includes:

1. Locating and marking of reference points for columns on plates or foundations, using master straightedge, squares, transit, and measuring tape;

2. Using rigging or cranes to lift parts to specified positions;

3. Aligning structures or plate sections, using plumb bobs, levels, wedges, dogs, or turnbuckles;

4. Drilling, reaming, chipping, caulking, and grinding of structures and sections and bolting or welding them together;

5. Setting of drums and headers and installation of tubes;

6. Cleaning up as necessary in connection with this work; and

7. Riveting, acetylene burning, rigging, fitting-up, impact machine operating, unloading and handling of material and equipment where power equipment and rigging are required;

(C) Bricklayers—Applies to workers who prepare, lay, set, bed, point, patch, grout, caulk, cut, fit, plumb, align, level, anchor, bolt, or weld brick, stone masonry, precast aggregate panels, and all types of artificial or imitation masonry. Also, the workers install expansion joint materials in brick, stone masonry, precast aggregate panels, and all types of artificial or imitation masonry. The work falling within this occupational title of work description includes:

1. The unloading of brick, stone masonry, precast aggregate panels, and all types of artificial or imitation masonry where power equipment and rigging are required;

2. The masonry paving and rip-rapping of all types, with or without mortar;

3. The reinforcing of masonry, including placing, tying, and setting of rods;

4. The application of insulation systems and materials, and air and/or vapor barrier systems and materials, by spray, trowel, roller, adhesive, or mechanically fastened in or to all masonry walls;

5. The caulking of abutting masonry openings in masonry walls, expansion joints, and false joints in all types of masonry;

6. The waterproofing of all types of masonry, which shall include installation and application of air and/or vapor barrier systems and materials by spray, trowel, roller, adhesive, or mechanically fastened; and

7. The cleaning, tuckpointing, sandblasting, steam cleaning, and Guniting work on all types of masonry;

(D) Carpenter (which shall include pile driver, millwright, lather, and linoleum layer)—Applies to workers who construct,



erect, install, and repair structures, structural members and fixtures made of wood, plywood, wallboard, and materials that take the place of wood, such as plastic, metals, composites, fiberglass, and Transit sheeting and Cemesto Board, using carpenter hand tools and power tools. The work falling within this occupational title of work description includes:

1. General Carpenter.

A. The layout of buildings or structures on the site or plot. The installation of aluminum expansion joints for buildings and bridge structure as well as concrete strike-off machines.

B. The making and setting of all concrete forms (except curb forms on heavy construction), including establishment of building lines or flow lines (box culverts, bridges) including footing forms. The making of all forms used in tilt-up construction. The layout, installation, and construction for wall forms and footing forms, all block-outs, wood or steel, layout, and installation of all embedded items.

C. The building and handling of scaffolds used by carpenters to work from. All scaffolding, constructed or assembled, fourteen feet six inches (14'6") and higher for normal or specialty use—regardless of purpose.

D. The building of rough wooden structures, such as concrete forms, scaffolds, wooden bridges, trestles, coffer dams, tunnel and sewer support, welding and burning.

E. The selection of specified type of lumber or other materials. Prepare layout, using rule, framing square, and calipers. Mark cutting and assembling lines on materials, using pencil, chalk, and marking gauge. Shape materials to prescribed measurements, using saws, chisels, and planes. Assemble, cut, and shape materials and fasten them together with nails, dowel pins, or glue. Erect framework for structures. Verify trueness of structure with plumb bob and carpenter's level. Apply decorative paneling to walls.

F. The installation of ladders, handrails, walkways, platforms, and gangways made of wood as well as shoring and lagging. Install doors and wood and metal windows and bucks, including hardware (bucks are rough frames in which finished frames are inserted) in building framework and brace them with boards nailed to framework. Install pallet racks and metal shelving. Install subflooring in buildings. Install insulation such as batt, board, safin, thermal, styrofoam, sound attenuation, fiberglass when the installation of the insulation material is not being applied as an integral part of the roofing system. Nail plaster grounds (wood or metal strips) to studding. Fit and nail sheathing on outer walls and roofs on

buildings. Install beams and trusses of wood laminate.

G. The making, handling, and setting of all frames, sash, blinds, trim, and other fixtures (for example, cabinets, bookcases, and benches), when made of wood or any wood substitute. The handling and assembly of chairs, seats, bleachers, and benches and other furniture in theaters, halls, schools, and other places of assemblage on floors of any kind. Install protection screens, chalk boards, toilet partitions (plastic laminate, solid plastic). Caulking of fixtures and countertops including Corian tub and shower enclosures.

H. The installation of wood and metal studs and exterior panels.

I. The handling, cutting, sawing, fitting of drywall (sheetrock), and lead-lined drywall whether for walls, ceilings, floors, soffits, or any use, no matter how installed—nailed, screwed, glued, or otherwise (interior, exterior). Lead-lined drywall is used in X rays to avoid radiation exposure. Install corner guards and wooden and plastic column covers.

J. The handling and installation of acoustical and egg crate ceiling systems in its entirety (hanger wire, grid, molding, tile) whether vertically or horizontally installed.

K. The installation of all builders hardware, including door tracks of every description. The installation of all weather strips. The making, fitting, and hanging of fly screens for doors, windows, and other openings.

L. Installation of wood and hollow metal doors, rollup garage doors, overhead doors or rolling fire doors, automatic doors, channel iron door bucks, glass sliding, and bi-fold doors.

M. The installation of access flooring, computer floors, and raised or elevated floors. Install modular headwall units and laboratory casework and fume hoods;

2. Pile Driver—The work falling within the occupational title of work description for pile driver includes:

A. The handling, layout, driving, cutting, and splicing of wood, metal, or concrete piling regardless of purpose (for example, sheets, I-beams, pile caps, and welding to piling);

B. The assembly, disassembly, and rigging of the pile driving equipment; and

C. The conduct of underwater diving that is incidental to pile driving work;

3. Millwright—Applies to workers who design, build, or repair mills or mill machinery; hoist, dismantle, erect, assemble, line, and adjust all machines used in the transmission of power in buildings, factories or elsewhere; unload machines used in the transmission of power in buildings, factories, or elsewhere, where power equipment and rigging

are required. The work falling within this occupational title of work description includes: the setting of all classes of engines, direct drive motors, dynamos, turbines, generators, and air compressors and pumps. The assembling, setting, and packing of all compressors and pumps. The placing of all pulleys, sheaves, and fly wheels on the listed equipment. The making and setting of all templates and bolts for all machinery requiring same. Drypacking for sole plates. Installation of truck and railroad scales. Installation of trash compactors. Installation of all types of conveyors. The cutting and threading of all bolts. The handling and operating of all acetylene and devices for heating, welding, and cutting when used in connection with millwright work;

4. Lather—Applies to workers who erect horizontal metal framework to which laths are fastened, using nails, bolts, studgun, or a combination of these, drills holes in floor and ceiling, and drives ends of wooden or metal studs into holes to provide anchor for furring or rockboard laths. The occupational title of lather applies to workers who nail, clip, or fasten, all types of wood, wire, and metal laths, plasterboard, wallboard, rockboard, gypsum, sheetrock, and acoustical materials which take the place of same to walls, ceilings, and partitions of buildings to provide supporting base for plaster, fireproofing, or acoustical material. The occupational title of work description for lather applies to workers who erect all metal plastering accessories which are covered or serve as ground, or both, guard, stock, or screed for plaster materials, including wire mesh. The work falling within the occupational title of work description includes:

A. The installing of carrying bars and purlins (pieces of horizontal timber), light iron, and metal furring (thin strips of wood or metal to create air space) of all descriptions, such as rods, channels, flat iron, T-bar, H-bar, and other ceiling bars or systems for the receipt of lath and board;

B. The wiring of plasterer channels to overhead structural framework to provide support for plaster or acoustical ceiling tile; and

C. The nailing of plaster grounds (wood or metal strips) to studding to provide a guide for those workers performing work falling within the occupational title of work description for plasterer;

5. Linoleum Layer—Applies to workers who measure, cut, sew, make-up and seam, tape, fit, lay, and install and seal and wax materials to be cemented, tacked, or otherwise applied to its base, wherever it may be. These materials may be used as shock-absorbing, sound-absorbing, or decorative coverings. With the exception of terrazzo,



magnesite, and latex built-up floors, the materials include oil cloth, matting, linen, carpet, synthetic turf, linoleum, vinyl, plastic, rubber, cork, mastic, asphalt, mastipave, tile, wood tile, interlocking and magnetic tile, chalk and bulletin board, nonslip or abrasive materials, resilient, decorative seamless surface coatings, monolithic coverings (monolithic shall mean all resilient seamless material such as epoxy, polyethylene, plastics and their derivatives, components and systems), and all other resilient coverings on floors, walls, counters, table tops, and ceilings. The work falling within the occupational title of work description includes:

A. The handling of materials at the point of installation;

B. The performing of all necessary preparation and finish work, such as sweeping, scraping, sanding, or chipping dirt and irregularities from base surfaces and filling cracks with putty, plaster, or cement grout to form smooth, clean foundations, drilling holes for sockets and pins;

C. The installing of underlayment, sanding and filling, fitting of metal edgings, metal corners, and caps and fitting devices for attachment of these materials;

D. The spreading of adhesive cement over floor to cement foundation material to the floor;

E. The laying of covering on cement; and

F. The rolling of finished floor to smooth it out and press cement into base and covering;

(E) Cement Mason (which shall include plasterer)—The work falling within this occupational title of work description includes:

1. Cement Mason - Applies to workers who perform work on concrete where finishing tools are used.

A. The setting of screeds, the rodding (buildings), shaping, smoothing, and finishing of the surfaces of freshly poured concrete floors, walls, sidewalks, curbs, steps, and stairways, the finishing of extruded barrier rails or any other concrete surface requiring finishing, using hand tools or power tools, including floats, trowels, screeds, and straightedge.

B. The removing of rough or defective spots from concrete surfaces, using grinder or chisel and hammer and patching holes with fresh concrete or epoxy compound preparatory to sacking.

C. The molding of expansion joints and edges, using edging tools, jointers, and straightedge.

D. The application of penetrating sealer and primer protective coatings to concrete floors and steps when part of the finishing process.

E. The installation of seamless com-

position floors and the installation and finishing of epoxy-based coatings or polyester-based linings to all surfaces, when the coatings or linings are applied by spraying or troweling.

F. The sandblasting or water blasting for architectural finish or preparatory to patching.

G. The cutting of joints with concrete saw for the control of cracks in buildings and sidewalks, driveways, and curbs and gutters contiguous to buildings.

H. The setting of concrete curb, gutter, and sidewalk forms one (1) board high up to twelve inches (12");

2. Plasterer - Applies to workers who apply gypsum, Portland cement, stucco, imitation stone, and kindred materials and products to interior walls, ceilings, and partitions and to exterior walls of buildings, and finish those materials and products.

A. The spreading of plaster over laths, masonry, or any other base, using trowel, and smoothing the plaster with darby and float for uniform thickness;

B. The application of the various manufacturers' brand names of thin coat or plaster veneer;

C. The application of all bonding agents and mastical;

D. The roughing of undercoat with wire or metal scraper to provide bond for succeeding coat of plaster;

E. The application of all malleable plastic materials and epoxy materials;

F. The setting in place of plaster-board, insulation board, styrofoam and bead-board, ground, locks, patent dots, cork plates, brownstone and acoustical tile, fiberglass reinforcement and finished products;

G. The plastering of joints, nail holes, and bruises on wallboard;

H. The grouting and filling of door bucks, runners, and similar installations, in conjunction with plastering operations;

I. The application of scratchcoat, browncoat, and finish coat of plaster to wood, metal or board laths successively to all ceilings and walls when finished with terrazzo or tile, and the application of any plastic material to same;

J. The fireproofing of all building assemblies with plaster materials, sprayed fiberglass or similar materials, whether applied to gypsum, metal lath, or directly;

K. The application of crushed stone, marble, or ceramic chips and broken glass where embedded in plaster, or similar materials;

L. The placing of acoustic blocks with any plastic material, regardless of thickness;

M. The placing, by any method, of plaster or composition caps and ornaments;

N. The creating of decorative textures in finish coat by marking surface of coat with brush and trowel or by spattering it with small stones (stucco) where plastering equipment or materials, or both, are used; and

O. The operation and control of all types of plastering machines, including power trowels and floats;

(F) Communications Technician—Applies to workers who install, inspect, repair, and service electronic and telecommunication systems. The work falling within the occupational title of Communication (Electronic/Telecommunication) Technician includes:

1. Installing, repairing, and servicing of radio, television, and recording systems and devices; systems for paging, intercommunication, public address, wired music, clocks, security and surveillance systems, and mobile radio systems; fire alarm and burglar alarm systems;

2. Wiring of low-voltage surface wiring and wiring in nonmetallic conduits and incidental shielded metallic conduit runs of no longer than ten feet (10') nor larger than one inch (1") when required in conjunction with the work listed in this rule;

3. Installing, repairing, servicing, or a combination of these, of the Main Distribution Frame (MDF) where the permanent outside lines entering a building terminate and where the subscriber's line multiple cabling and trunk multiple cabling originate. It is usually located on the ground floor of a building;

4. Installing, repairing, servicing, or a combination of these, of the Intermediate Distribution Frames (IDF), which provides flexibility in allocating the subscriber's number to the line unit or equipment in the office that is to be associated with the particular line. These frames are located on each floor of a building;

5. Installing, repairing, servicing, or a combination of these, of the subpanels (blocks). The subpanels are connecting devices where large feed cables terminate at the distribution frames;

6. Installing, repairing common equipment or key service unit, or a combination of these. This equipment consists of a back-board assembly and an equipment mounting frame, which are utilized for connecting external telephones;

7. Installing, repairing, servicing of the instruments, terminals, and sets, or a combination of these. This equipment is at either end of a circuit, or at a subscriber's or user's terminal;

8. Installing, repairing, servicing, or a combination of these, of the ancillary or add-on equipment such as bells, buzzers,



speakerphones, headsets, automatic dialers, recorders; and

9. Installing, repairing, servicing of the telephone cable, or a combination of these. Telephone cable includes: network channel service cable; riser cables between floors of a building; distribution cables installed on each floor of a building in the floor or the ceiling, and inside wires between the telephone and the connection to the distribution cable;

(G) Electrician—Applies to workers who are responsible for installation, assembly, construction, inspection, operation, and repair of all electrical work within the property lines of any given property (manufacturing plants, commercial buildings, schools, hospitals, power plants, parking lots). This scope of work shall begin at the secondary site of the transformer when the transformer is furnished by the local utility and the service conductors are installed underground. When service conductors are installed overhead in open air from wooden poles, this scope of work shall start immediately after the first point of attachment to the buildings or structures. The work falling within this occupational title of work description includes:

1. Planning and layout of electrical systems that provide power and lighting in all structures. This includes cathodic protection systems utilized to protect structural steel in buildings and parking structures;

2. All handling, moving, loading, and unloading of any electrical materials, materials used in association with an electrical system, electrical equipment, and electrical apparatus on the job site, whether by hand or where power equipment and rigging are required;

3. Welding, burning, brazing, bending, drilling, and shaping of all copper, silver, aluminum, angle iron, and brackets to be used in connection with the installation and erection of electrical wiring and equipment;

4. Measuring, cutting, bending, threading, forming, assembling, and installing of all electrical raceways (conduit, wireways, cable trays), using tools, such as hacksaw, pipe threader, power saw, and conduit bender;

5. Installing wire in raceways (conduit, wireways, troughs, cable trays). This wire may be service conductors, feeder wiring, subfeeder wiring, branch circuit wiring;

6. Chasing and channeling necessary to complete any electrical work, including the fabrication and installation of duct banks and manholes incidental to electrical, electronic, data, fiber optic, and telecommunication installation;

7. Splicing wires by stripping insulation from terminal leads with knife or pliers, twisting or soldering wires together, and applying tape or terminal caps;

8. Installing and modifying of lighting fixtures. This includes athletic field lighting when installed on stadium structures or supports other than wooden poles, or both;

9. Installing and modifying of all electrical/fiber optic equipment (AC-DC motors, variable frequency drives, transformers, reactors, capacitors, motor generators, emergency generators, UPS equipment, data processing systems, and annunciator systems where sound is not a part thereof);

10. Installing of raceway systems utilizing conduit, conduit bodies, junction boxes, and device boxes for switches and receptacles. This also may include wiring systems utilizing other methods and materials approved by the *National Electrical Code* (MC cable, AC cable, BX, or flexible metal tubing or electrical nonmetallic tubing);

11. Installing of main service equipment, distribution panels, subpanels, branch circuit panels, motor starters, disconnect switches, and all other related items;

12. Installing and wiring of instrumentation and control devices as they pertain to heating, ventilating, air conditioning (HVAC) temperature control and energy management systems, building automation systems, and electrically or fiber optic operated fire/smoke detection systems where other building functions or systems are controlled;

13. Installing conduit or other raceway greater than ten feet (10') when used for the following: fire alarm systems, security systems, sound systems, closed circuit television systems or cable television systems, or any system requiring mechanical protection or metallic shielding (telephone systems);

14. Testing continuity of circuit to insure electrical compatibility and safety of components. This includes installation, inspecting, and testing of all grounding systems including those systems designed for lighting protection; and

15. Removing electrical systems, fixtures, conduit, wiring, equipment, equipment supports, or materials involved in the transmission and distribution of electricity within the parameters of the building property line if reuse of any of the existing electrical system is required. This may include the demolition and removal and disposal of the electrical system;

(H) Elevator Constructor—Applies to workers who assemble and install electric and hydraulic freight and passenger elevators, escalators, dumbwaiters, and moving walks. The work falling within this occupational title of work description includes:

1. The handling, unloading, and hoisting of all equipment to be assembled or installed by workers performing work within this occupational title of work description,

from the time that equipment arrives at, or near the building site;

2. The wrecking or dismantling of elevator plants, to include elevators, escalators, dumbwaiters, moving walks, and all other equipment to be reused and assembled or installed by workers performing work within this occupational title of work description;

3. The sinking, drilling, boring, digging cylinder wells, or backfilling for hydraulic lifts, hydraulic elevators, or screw lifts;

4. The layout, erecting and assembling of all elevator equipment (for example, electric, hydraulic, steam, belt, compressed air, and hand-powered elevators; dumbwaiters, residence elevators, parking garage elevators), and the assembly of all escalators, moving walks and link belt carriers;

5. The erecting and assembly of all theater stage and curtain equipment and guides and rigging to them, organ consoles, and orchestra elevators;

6. The installing of all wiring, conduit, and raceways from the first point of attachment of main feeder terminals on the controller to other apparatus and operating circuits;

7. The operating of temporary cars; and

8. The installing of all elevator enclosures, fronts, fascias, sills, frames, and bucks;

(I) Glazier—Applies to workers who select, cut, prepare, handle, install, or remove all window glass, plate, and all other types of glass, including structural glass, mirror glass, tempered and laminated glass, safety or protection glass, all types of insulating glass units, all plastics or other similar materials when used in place of glass and when set or glazed with putty, moulding rubber, cement, lead, and all types of mastic, or other materials used in place of same. The workers performing work within this occupational title of work description install these materials in windows, louvers, doors, partitions, skylights, and on building fronts, walls, ceilings and tables, whether the materials are set in wood, stone, cement, or metal of all types. The work falling within the occupational title of work description includes:

1. The installing of mirrors of all types;

2. The marking of an outline or pattern on glass and cut glass with a glasscutter;

3. The breaking off of excess glass by hand or with a notched tool;

4. The fastening of glass panes into wood sash with glazier's points, and the spreading smooth of putty around the edge of panes with a knife to seal joints;

5. The installing of metal window and door frames into which glass panels are to be fitted or sliding windows. The bolting of metal hinges, handles, locks, and other hardware to prefabricated glass doors;



6. The installing of mirror or structural glass on building fronts, walls, ceilings or tables, using mastic, screws, or decorative moulding;

7. The installing of metal-framed glass enclosures for showers, bathtubs, and skylights; and

8. The installing, cutting, and removal of all window glass, plate, and all other types of glass, including structural glass, mirror glass, tempered and laminated glass, safety or protection glass, all types of insulating glass units, all plastics or other similar materials when used in place of glass and when set or glazed with putty, molding rubber, cement, lead, and all types of mastic, or other materials used in place of same;

(J) Ironworker—Applies to workers who perform work in connection with field fabrication, erection, or both, installation, removal, wrecking, and dismantling of structural, architectural, and reinforcing iron and steel, ornamental lead, bronze, brass, copper, and aluminum, and plastics or other materials when used in place of them. The work falling within the occupational title of work description includes:

1. Structural. The unloading, erecting, bolting-up, plumbing-up, welding, and installing of structural steel, including any field fabrication;

2. Reinforcing. The unloading, carrying, placing, and tying of all concrete reinforcing, such as re-bar, wire mesh, expanded metal or post tensioning cable (including the tension process) or prestress cables when installed on the job site;

3. Rigging. The unloading, moving, handling, placing, and setting of electrical machinery and equipment when rigging or power equipment, or both, is used (with the exception of setting of electric motors). The assembly and erection of radio and television and other structural steel towers (with the exception of electrical transmission towers). The unloading, handling, moving, and placing of machinery to be assembled or dismantled, erected, or installed to its approximate position (over the anchor bolts);

4. Windows. The installation of metal windows (with the exception of store fronts display windows), curtain walls, and metal panels. The caulking of metal-to-metal joints and metal-to-brick;

5. Doors. The erection of curtain type doors (overhead rolling-type doors), heavy industrial doors when made of metal, fire doors, and exterior metal hinged doors that carry a fire underwriters label are erected by iron workers;

6. Sheeting and decking. The installation of sheeting which is attached to metal framework including metal floor decking;

7. Metal buildings. The erection and

installation of structural steel and sheet metal packaged buildings when they come in a package unit, such as Butler, Delta, Varco Prudent, or other name brand packaged buildings. The installation of all doors, windows, and insulation (when installed in conjunction with sheeting) in the packaged buildings. The installation of metal siding and metal roof decking, regardless of the fastening method or the object to which it is fastened;

8. Elevators. The installation of elevator doors for gates manually operated and all elevator enclosures, fronts, fascias, sills, frames, and bucks;

9. Precast. The unloading and installation/erection of precast bridge girders, single T's, double T's, top panels, and tilt-up slabs; and

10. Other. The installation of all catwalks, stairways, and hand rails made of aluminum, bronze, or any type of metal, glass or plastic. The installation of ornamental iron, such as revolving doors, gates, handrails, window grills, jail and cell work, and chain link fences. The installation of dry storage bins, hoppers, chutes, and conveyors where sand ore, coal, or any dry component is stored or transferred. The erection, installation, removal, wrecking, and dismantling of bridges, viaducts, cableways, tramway, mono-rail transportation systems. The erection, installation, removal, wrecking, and dismantling of locks, gates, metal forms, railings (including pipe). The erection, installation, removal, wrecking, and dismantling of frames in support of boilers. The installation of metal siding and metal roof decking, regardless of the fastening method, or the object to which it is fastened. The handling, burning, welding, and tying of all materials used to reinforce concrete structures. The installation and erection of TV and microwave towers, self-supporting towers, or guy towers. The installation of metal guardrails with metal posts and highway signage;

(K) General Laborer (including first semi-skilled laborer and second semi-skilled laborer)—Consists of providing routine manual labor. This work encompasses several sub-classifications, with the title and work description considered in light of whether the public works project pertains to building construction or heavy/highway construction.

1. Building construction. The subtitles falling within the occupational title of work description for laborer, as applicable to building construction, are as follows:

A. Laborer. The work falling within this subtitle of work description includes:

(I) Being included in one (1) of the following categories: flagmen, heaters, material plant man, carpenter tender, landscaper, signalman, wrecker (old/new structures),

form handler, or posthole digger;

(II) Cleaning and clearing of all debris for all crafts, loading and unloading, conveying, distributing, construction material by hand and collecting and hoisting debris, backfilling, grading, and landscaping by hand;

(III) Covering of tanks, structures, and material piles with tarpaulins or other materials. Cleaning of masonry and other type walls and windows. Signaling and hoisting concrete buckets and for all other material handled by workers falling within the occupational title of work description for laborer;

(IV) Providing drinking water. Handling and cleaning of concrete chutes. Cleaning of concrete spills and chipping where hand tools are required. Performance of work necessary in remedying defects in concrete caused by leakage, bulging, sagging, or shifting of forms when finishing tools are not used. Jackhammer and paving breaker, air compressors, motor buggies, pumps (removal of water), except set-up men and nozzle men, chipping tool operator, concrete mixer operator (up to and including two- (2-) bag capacity); and

(V) Laying nonpressurized pipe for downspout drain lines, header lines, or laying of nonpressurized conduit, or a combination of these, for the carrying of storm water, waste, sewage, gravity flow lines, catch basins and manholes, effluent lines, originating outside the building and all those lines originating inside the building at the first Y, T, or connection outside the building;

B. First semiskill laborer. The work falling within this subtitle of work description includes: hod-carriers, plasterers, and cement mason tenders (who assist bricklayers, plasterers, and cement masons). The mixing, packing, wheeling, and tempering of mortar and fire clay. The mixing, handling and conveying of all other materials used by bricklayers, plasterers, and cement masons (for example, brick, tile, stone and cast stone), whether done by hand or using a forklift (walk behind or similar types). Building of scaffolds, trestles, boxes, and swinging staging for bricklayers, plasterers, and cement masons; and

C. Second semiskill laborer. The work falling within this subtitle of work description includes: concrete pump set-up men and nozzle men, tile layers and bottom men, on sewers and drains, cutting torch, and burning bar (demolition), trench, or pier holes twelve feet (12') or over, wagon drill, air track or any mechanical drill, powder man, tamper, one hundred pounds (100 lbs.) or over, laborers working for mechanical and electric contractors (including but not limited to digging of all trenches, ditches, holes, paving of concrete, and cleaning of all trash),



paving breaker, jackhammer and vibrator, laser beam man for sewer, grade checker for roads and railroads, asbestos removal (except mechanical systems that are not being scrapped and any type of roofing where the roof is to be relaid), hazardous waste removal, disposal work, or any combination of these.

2. Heavy/highway construction. The subtitle falling within the occupational title of work description for general laborer, as applicable to heavy/highway construction, are as follows:

A. Laborer. The work falling within this subtitle of work description includes: carpenters tenders, salamander tenders, dump man, ticket takers, flagman, loading trucks under bins, hoppers and conveyors, track men, cement handler, dump man on earth fill, Georgia buggy man, material batch hopper man, spreader on asphalt machine, material mixer man (except on man holes), coffer dams, riprap pavers—rock, block, or brick, signal man for materials handled by laborers, scaffolds over ten feet (10') not self-supported from ground up, skipman on concrete paving, wire mesh setters on concrete paving, work in connection with non-pressurized pipelines, such as nonpressurized sewer, water, gas, gasoline, oil, drainage pipe, conduit pipe, tile, and duct lines and other nonpressurized pipelines; power tool operator; work performed by hand in connection with hydraulic or general dredging operations, form setters (curb and gutter), puddlers (paving only), straw blower nozzle man, asphalt plant platform man, chuck tender, crusher feeder, men handling creosote ties or creosote materials, men working with and handling epoxy material(s), topper of standing trees, feeder man on wood pulverizers, board and willow mat weavers and cable tiers on river work, deck hands, guardrail and temporary signs, pile dike and revetment work, all laborers working on underground tunnels less than twenty-five feet (25') where compressed air is not used, abutment and pier hole men working six feet (6') or more below ground, men working in coffer dams for bridge piers and footings in the river, Barca tamper, Jackson or any other similar tamp, cutting torch man, liners, curb, gutters, ditchliners, hot mastic kettleman, hot tar applicator, hand blade operators and mortar men on brick or block manholes, rubbing concrete, air tool operator under sixty-five pounds (65 lbs.), caulker and led man, chain or concrete saw under fifteen horsepower (15 HP). The unloading, handling, and carrying of concrete reinforcing bars, by hand, to the areas in which they are used, wrecking, stripping, dismantling, cleaning, moving, and oiling of all concrete forms; digging and laying sewer tile; and

B. Skilled laborer. The work falling within this subtitle of work description includes: vibrator man, asphalt raker, head pipe layer on sewer work, batterboard man on pipe and ditch work, cliff scalers working from Bosun's chairs, scaffolds, or platforms on dams or power plants over ten feet (10') high, air tool operator over sixty-five pounds (65 lbs.), stringline man on concrete paving and the like, sandblast man, laser beam man, wagon drill, churn drill, air track drill, and all other similar type drills, jackhammers, and other pneumatic hammers and tampers, Gunitite nozzle man, pressure grout man, screed man on asphalt, concrete saw fifteen (15) HP and over, grade checker, stringline man on electronic grade control, manhole builder, dynamite man, powder man, welder, tunnel man waterblaster—one thousand pounds per square inch (1000 psi) over, asbestos (except mechanical systems that are not being scrapped), hazardous waste removal, disposal, or any combination of these;

(L) Mason (which shall include marble mason, marble finisher, terrazzo worker, terrazzo finisher, tile setter, and tile finisher).

1. Marble Mason-Terazzo Worker—The work falling within the occupational title of work description for Marble Mason-Terazzo Worker includes:

A. The installing of marble, mosaic, venetian enamel, and terrazzo; the cutting and assembling of mosaics and art ceramics; the casting of all terrazzo on the job site; all rolling of terrazzo work;

B. The preparing, cutting, layering, or setting of metal, composition, or wooden strips and grounds on all bedding above concrete floors or walls; and the laying and cutting of metal, strips, lath, or other reinforcement, where used in terrazzo work;

C. The installing of cement terrazzo, magnesite terrazzo, dex-o-tex terrazzo, epoxy matrix terrazzo, exposed aggregate. Rustic or rough wash of exterior or interior of buildings. The mixing or applying of any other kind of mixtures of plastics composed of chips or granules of marble, granite, blue stone, enamel, mother of pearl, quartz ceramic colored quartz, and all other kinds of chips or granules when mixed with cement, rubber, neoprene, vinyl, magnesium chloride, or any other resinous or chemical substances used for seamless flooring systems. The applying of binding materials when used on walls, floors, ceilings, stairs, saddles, or any other part of the interior or exterior of the building, or other work not considered a part of the building such as fountains, swimming pools;

D. The finishing of cement floors where additional aggregate of stone is added by spreading or sprinkling on top of the fin-

ished base and troweled or rolled into the finish and then the surface ground by grinding machines (When no additional stone aggregate is added to the finished mixture, even though the surface may be ground, the work falls within the occupational title of work description for cement masons.); and

E. The carving, cutting, and setting of all marble, slate, including slate backboards, stone, alabaster, carrara, sanionyx, vitrolite, and similar opaque glass, scagliola, marble-itic, and all artificial, imitation, or case marble of whatever thickness or dimension. This shall apply to all interior work, such as sanitary, decorative, and other purposes inside of buildings of every description wherever required, including all polish, honed, or sand finish.

2. Marble Finisher—The work falling within the occupational title of work description for Marble Finisher includes:

A. The preparation of floors and/or walls by scraping, sweeping, grinding, and related methods to prepare surface for Marble Mason installation of construction materials on floor and/or walls; the movement of marble installation materials, tools, machines, and work devices to work areas; the erection of scaffolding and related installation structures;

B. The movement of marble slabs for installation; the drilling of holes and the chiseling of channels in edges of marble slabs to install wall anchors, using power drill and chisel; the securing of marble anchors to studding, using and covering ends of anchors with plaster to secure anchors in place;

C. The supply and mixture of construction materials for Marble Mason; the mixture of grout, as required, following standard formulas and using manual or machine mixing methods; the application of grout to installed marble; the movement of mixed mortar or plaster to installation area, manually or using wheelbarrow;

D. The removal of excess grout, using wet sponge; the cleaning of installed marble surfaces, work and storage areas, installation tools, machinery, and work aids, using water and cleaning agents;

E. The modification of mixing, material moving, grouting, polishing, and cleaning metal pieces, using a torch, spatula, and heat sensitive adhesive and filler;

F. The removal of marble installation materials and related debris from immediate work area; the storing of marble, installation material tools, machines, and related items; and

G. The provision of assistance to Marble Mason with the following tasks: bending or forming of wire to form metal anchors, using pliers; inserting anchors into holes of marble slab; securing anchors in



place with wooden stakes and plaster; selecting marble slab for installation following numbered sequences or drawings; grinding and polishing marble, using abrasives, chemical and/or manual, in machine grinding and/or polishing techniques, under Marble Mason's direction; the moving and positioning of marble.

3. Terrazzo Finisher—The work falling within the occupational title of work description for Terrazzo Finisher includes:

A. The preparation of floors and/or walls by scraping, sweeping, grinding, and related methods to prepare surface for Terrazzo Worker installation of construction materials on floors, base, and/or walls; the moving of terrazzo installation materials, tools, machines, and work devices to area, manually or using wheelbarrow;

B. The supply and mixture of construction materials for Terrazzo Worker; the preparation, mixture by hand, mixture by mixing machine, or transportation of pre-mixed materials and the distribution with shovel, rake, hoe, or pail, of all kinds of concrete foundations necessary for mosaic and terrazzo work; the dumping of mixed materials that form base or top surface of terrazzo into prepared installation site, using wheelbarrow; the measuring of designated amounts of ingredients for terrazzo or grout, using graduated containers and scale, following standard formulas and specifications, and the loading of portable mixer using proper means of transport; the mixture of materials according to experience and requests from Terrazzo Worker;

C. The spreading of marble chips or other material over fresh terrazzo surface and the pressing of the material into terrazzo by use of a roller; the application of grout finishes to surfaces of installed terrazzo; the spreading of grout across terrazzo to finish surface imperfections, using trowel; the installation of grinding stones in power grinders, using hand tools; the fine grinding and polishing of the surface of terrazzo, when grout has set, using power grinders; the application of curing agent to installed terrazzo to promote even curing, using brush or sprayer; the cutting of grooves in terrazzo stairs, using power grinder, and the filling of grooves with nonskid material;

D. The modification of mixing, grouting, grinding, and cleaning position and the securing of moisture membrane and wire mesh prior to pouring base materials for terrazzo installation;

E. The washing of the surface of polished terrazzo, using cleaner and water, and the application of sealer, according to manufacturer specifications, using brush; the cleaning of the installation site, and storage areas, tools, machines, and equipment; the

removal of Terrazzo Worker materials and related debris from immediate work area; and

F. The provision of assistance to Terrazzo Worker with the following tasks: grinding surfaces of cured terrazzo; using power grinders.

4. Tile Setter—The work falling within the occupational title of work description for Tile Setter includes:

A. The application of tile to floors, walls, ceilings, stair treads, promenade roof decks, garden walks, swimming pools, and all places where tiles may be used to form a finished surface for practical use, sanitary finish, or decorative purpose. (Tile includes all burned clay products, as used in the tile industry, either glazed or unglazed, all composition materials; all substitute materials in single units up to and including, fifteen inches by twenty inches by two inches (15" × 20" × 2") (except quarry tiles larger than nine inches by eleven inches (9" × 11")) and all mixtures in the form of cement, plastics, and metals that are used as a finished surface.);

B. The cutting and shaping of tile with saws, tile cutters, and biters; and

C. The positioning of tile and tapping it with a trowel handle to affix tile to plaster or adhesive base.

5. Tile Finisher—The work falling within the occupational title of work description for Tile Finisher includes:

A. The preparation of floors and/or walls by scraping, sweeping, grinding, and related methods for Tile Setter to install construction materials on floors and walls; the movement of tiles, tile setting tools, and work devices from storage area to installation site manually or using wheelbarrow;

B. The supply and mixture of materials for Tile Setter; the supply and mixture of construction materials for Tile Setter; the mixture of mortar and grout accordingly to standard formulas and request from Tile Setter using bucket, water hose, spatulas, and portable mixer; the modification of mixing, grouting, grinding, and cleaning procedures according to type of installation or material used; the supply to Tile Setter of mortar, using wheelbarrow and shovel; the application of grout between joints of installed tile, using grouting trowel; the application of grout; the cutting of installed tile;

C. The removal of excess grout from tile joints with a sponge and scraping of corners and crevices with a trowel; the application of caulk, sealers, acid, steam, or related agents to caulk, seal, or clean installed tile, using various application devices and equipment;

D. The wiping of surfaces of tile after grouting to remove grout residue and polish tile, using non-abrasive materials; the removal of Tile Setter materials and related

debris from immediate work area; the cleaning of installation site, mixing and storage tools, and equipment, using water and various cleaning tools; the storing of tile setting material machines, tools, and equipment; and

E. The provision of assistance to Tile Setter to secure position of metal lath, wire mesh, felt paper, Dur/rock or wonderboard prior to installation of tile;

(M) Operating Engineer (which shall include operating engineer group I, operating engineer group II, operating engineer group III, operating engineer group III-A, operating engineer group IV, and operating engineer group V)—Applies to workers who perform work falling within the occupational title of work description for operating engineer/portable and hoisting operator, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment. This occupational title encompasses several subclassifications, with the title and work description considered in light of whether the public works project pertains to building construction or heavy/highway construction.

1. Building construction. The subtitles falling within the occupational title of work description for operating engineer, as applicable to building construction, are as follows:

A. Group I—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: crane (for example, crawler or truck); dragline—clam shell—gradall; Derrick (all types); kimmer scoop; power shovel or backhoe over one (1) cubic yard; pile driver (for example, land or floating); Whirley; mechanic and welder; hydraulic, self-propelled crane; stinger or cherry picker crane; switch boat; concrete portable plant/concrete mixer paver; cableways;

B. Group II—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: asphalt paver and spreader/concrete spreader; asphalt plant mixer operators; asphalt plant operator; backfillers; back hoe (under one (1) cubic yard); Barber-Green loader (similar type); blade—power, all types; boats—power; boilers; boring machine (all types, including tunnel boring); brooms—power operated (all types); concrete saw (self-propelled); chip spreader (front man); clef plane operators; combination concrete hoist and mixer such as mix or mobile; crab—power operated; crusher rock; ditching machine; dozer/dredges;



finishing machine; firemen on rigs; flex plane; floating machine; form grader; greaser; hoist operator (all types); hopper—power operated; hydra hammer (all types); Lad-A-Vator—similar type; loaders—all types, including skid-steer (for example, Bobcat); locomotives (all types); curb finishing machine; mucking machine; orange peels; pumps (all types); push cats; rollers (all types); scoops (all types except skimmer scoop); self-propelled rotary drill; air compressors (all types); side boom; siphons, jets, and jennies; welding machine; subgrader; testhole machine; throttle man tractors over fifty (50) HP; air tugger with air compressor; anchor placing barge; Ahoy force feeder loader (self-propelled); bull float; pipe cleaning/wrapping machine; conveyor; heaters, fuel fired with forced air; quadtrack; tie tamper; vibrating machine; well drilling machine; forklift (except masonry forklift);

C. Group III—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: tractors (under fifty (50) HP); distributor (bituminous); scissor lift; small machine (operator); mud jack; wench truck operator; pug mill operator; elevator-push button; A-frame truck; mixers; oilers;

D. Group III-A—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as a masonry forklift;

E. Group IV—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as a self-propelled floor sweeper; and

F. Group V—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: elevator—auto; air pressure oiler; air pressure engineer.

2. Heavy/highway construction. The subtitles falling within the occupational title of work description for operating engineer, as applicable to heavy/highway construction, are as follows:

A. Group I—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: asphalt finishing machine and trench; widening spreader;

asphalt plant console operator; autograder; automatic slipform paver; backhoe; blade operator (all types); boat operator (all types); boilers—two (2); central mix concrete plant operator; clamshell operator; concrete mixer paver; crane operator; Derrick or Derrick trucks; ditching machine; dozer operator; dragline operator; dredge booster pump; dredge engineman; dredge operator; drill cat with compressor mounted on cat; drilling or boring machine rotary self-propelled; high-loader including skid steer (for example, Bobcat); hoisting engine—two (2) active drums; launchhammer wheel; locomotive operator—standard gauge; mechanics and welders; mucking machine; piledriver operator; Pitman crane operator; push cat operator; quadtrack; scoop operator—all types; shovel operator; sideboom cats; skimmer scoop operator; trenching machine operator; truck crane;

B. Group II—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: A-frame truck; asphalt hot mix silo; asphalt plant fireman, drum or boiler; asphalt plant mixer operator; asphalt plant man; asphalt roller operator; backfiller operator; Barber-Greene loader; chip spreader; concrete mixer operator, skip loader; concrete plant operator; concrete pump operator; crusher operator; dredge oiler; elevating grader operator; forklift; greaser—fleet; hoisting engine—one (1); locomotive operator—narrow gauge; multiple compactor; pavement breaker; power-broom—self-propelled; power shield; roter; side discharge concrete spreader; slip form finishing machine; stumpcutter machine; throttle man; tractor operator—over fifty (50) HP; winch truck;

C. Group III—This subtitle applies to workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as follows: boilers—one (1); chip spreader (front man); churn drill operator; clef plane operator; concrete saw operator self-propelled; curb finishing machine; distributor operator; finishing machine operator; flex plane operator; float operator; form grader operator; pugmill operator; roller operator, other than high-type asphalt; screening and washing plant operator; siphons and jets; sub-grading machine operator; spreader box operator, self-propelled (not asphalt); tank car heater operator—combination boiler and booster; tractor operator fifty (50) HP or less; Umac, Ulric, or similar spreader; vibrating machine operator, not hand;

D. Group IV—This subtitle applies to

workers who operate, monitor, and control, repair, modify, assemble, erect, oil, service each or all electrically or electronically, hydraulically, or any power-operated equipment set forth as an oiler or oiler-driver (fireman—rig; maintenance operator);

(N) Outside- lineman, lineman operator, groundman, lineman tree trimmer, groundman tree trimmer, and any combination thereof.

1. Outside-lineman—Applies to workers who erect and repair transmission poles (whether built of wood, metal, or other material), fabricated metal transmission towers, outdoor substations, switch racks, or similar electrical structures, electric cables, and related auxiliary equipment for high-voltage transmission and distribution powerlines used to conduct energy between generating stations, substations, and consumers. The work (overhead and underground) falling within this occupational title of work description includes:

A. Construction, repair, or dismantling of all overhead and underground electrical installations. The handling and operation of all equipment used to transport men, tools, and materials to and from the job site. The framing, trenching, digging, and backfilling of vaults, holes and poles, and anchors (by hand or mechanical equipment), guying, fastening to the stub-in on concrete footings or pads, assembling of the grillage, grounding of all structures, stringing overhead wire, installing underground wire, splicing, and installation of transformers;

B. Construction and repair of highway and street lighting and traffic signal systems, cathodic protection systems, and ball field lighting systems;

2. Lineman operator—Operates equipment used on the outside line portion of a project. The lineman operator assists linemen in the performance of their work but does not climb or work out of any type of aerial lift equipment. The lineman operator does not perform any work that requires the use of hand tools;

3. Groundman—Work performed on the ground to assist the journeymen outside line construction/lineman on work not energized. Groundmen use jack hammers, air drills, shovels, picks, tamps, trenching equipment, and other such tools for excavating and/or compacting dirt or rock on the outside line portion of a project but do not use hand tools;

4. Lineman tree trimmer—Trimming and removal of trees, stumps, limbs, brush, and other related tasks in and around electrical systems by use of chainsaws, pruners, pole saws, and hand saws only when specifically required to provide clearance and right-of-way preparation for installation of overhead or underground high-voltage electric



utility lines, and excluding the clearance of right-of-ways related to heavy-highway construction or other public projects not directly related to the installation of electrical utility lines. Lineman tree trimmer work may be performed on the ground and in the air; and

5. Groundman tree trimmer—Assists the lineman tree trimmer in the performance of their work using rakes, chainsaws, chippers, and industrial mowers in and around electrical systems only when specifically required to provide clearance and right-of-way preparation for installation of overhead or underground high-voltage electric utility lines, and excluding the clearance of right-of-ways related to heavy-highway construction or other public projects not directly related to the installation of electrical utility lines. Groundman tree trimmer work is only performed on the ground;

(O) Painter—The work falling within the occupational title of work description for painter includes:

1. Preparation of surfaces. The washing, cleaning, pointing, and taping of drywall, regardless of material used, and smoothing of surfaces, using sandpaper, brushes, or steel wool. The removal of old paint or other coatings from surfaces, using paint remover, scraper, wire brushing, sandblasting, water blasting, liquid steam, or by any other similar process. The filling of nail holes, cracks, and joints with putty, plaster, or other fillers;

2. Color matching and mixing. The application of paint, varnish, stain, enamel, lacquer, vinyl, wallpaper, and other materials of whatever kind of quality applied to walls or ceilings with paste or adhesive, using brushes, spray gun (spray painter), or paint rollers. The application of polyurethane elastomers, vinyl plastics, neoprene, resin, polyester, and epoxy as waterproofing or protective coatings to any kind of surface (except roofs) when applied with brushes, spray guns, or rollers;

3. Texturing and decorating. The erecting of scaffolding or setting up of ladders to perform the work above ground level. The paperhanging of walls and ceilings with decorative wall coverings made of fabric, vinyl, or paper. The preparing of the surface to be covered by applying sizing, which seals the surface and makes the covering stick better. The removal of the old covering by soaking, steaming, or applying solvents. The patching of holes and other imperfections before applying the new wall covering. The measuring of the area to be covered; the cutting of the covering into strips of the proper size, the checking of the covering for flaws and the examination of the pattern so it can be matched when the strips are hung. The preparation of paste or other adhesives according to manufacturers' directions, and the brush-

ing or rolling it on the covering. The placing of the strips on the wall or ceiling, to match adjacent patterns. The smoothing of the strips to remove bubbles and wrinkles; the trimming of the top and bottom with a razor blade; and the painting or taping of highway striping, or both; and

4. Cleanup. The cleanup of tools and equipment required in connection with work falling within this occupational title;

(P) Plumber (which shall include pipe fitter).

1. General Plumber—Applies to workers who install and repair domestic potable water lines, gravity waste disposal systems inside the curb or fence lines, plumbing fixtures such as: bathtubs, sinks, and toilets—and appliances such as, dishwashers and water heaters. The work falling within the occupational title of work description for plumber includes:

A. Assembling and installing piping systems, fixtures and equipment for the transportation of domestic water and sewage. Piping systems installed in structures (for example, buildings, industrial plants) to the first Y, T, or connection located outside the building;

B. Cutting, threading, and bending pipe. Joining pipes by use of screws, bolts, fittings, solder, welding brazing, and caulking or any other method of making joints in the plumbing industry;

C. Assembling, installing, and repairing valves, pipe fittings, and pumps. Testing the piping system. Installing and repairing plumbing fixtures, such as sinks, bathtubs, water heaters, and water softeners; and

D. Cutting holes in floors and walls for pipes with point and hammer, core drill, or both.

2. Pipe Fitter—Applies to workers who fabricate, install, and repair piping systems to include: water and waste processing systems; heating and air-conditioning systems, pneumatic controls, and pneumatic delivery systems; powerhouse and all pressurized piping systems; gas, oxygen systems; gasoline systems not for public sale. The work falling within this occupational title of work description includes:

A. Piping systems installed in structures (for example, buildings, industrial plants, and the like);

B. Cutting, threading, and bending pipe. Joining pipes by use of screws, bolts, fittings, solder, welding, and caulking, or any other method of making joints in the pipefitting industry;

C. Assembling, installing, and repairing valves, pipe fittings, and pumps. Testing the piping system. Cutting holes in floors and walls for pipes with point and hammer, core drill, or both;

D. Installing of distribution lines (for example, water mains, sewer mains, oil and gas lines);

E. Welding of steel pipe joints and joining pipes with screws, bolts, fittings, solder, caulking, or any other method for making joints in the industry; and

F. Joining ductile iron and plastic pipes by using any method for making joints in the industry, when the pipe will be under pressure;

(Q) Roofer—Applies to workers who apply and install any and all types of roofing materials, other than sheet metal. The work falling within this occupational title of work description includes:

1. The installation of slate and tile and all substitute materials taking the place of slate and tile used for roofing including flat or promenade slate, with necessary metal flashing to make water-tight;

2. The cementing in, on, or around slate and tile roofs. The laying of felt or paper beneath the slate and tile. The dressing, punching, and cutting of all roof slate or tile either by hand or machinery;

3. The installation of all forms of plastic, slate, slag, gravel; asphalt and composition roofing; rock asphalt mastic when used for damp and waterproofing; prepared paper; compressed paper and chemically prepared paper, and burlap with or without coating. The installation of all damp resisting preparations regardless of the method of application in or outside of building. The installation of damp courses, sheeting, or coating on foundation work and tarred roofs. The laying of the tile or brick, when laid in asphalt or pitch tar;

4. The installation and application of new materials used in roofing, water-proofing, encapsulation, and containment process including all forms of elastomeric or plastic (elastoplastic), or both, roofing systems, both sheet and liquid applied, whether single-ply or multi-ply. The installation of aggregates or stone, used as a ballast for inverted roofing membrane assembly, or roof of similar construction where insulation is laid over the roofing membrane. The sealing and caulking of seams and joints on these elastoplastic systems to insure water-tightness. The applying of liquid-type elastoplastic preparation for roofing, damp, or waterproofing when applied with a squeegee, trowel, roller, or spray equipment whether applied inside or outside of a building. The priming of surfaces to be roofed, damp, or waterproofed, whether done by roller, mop, swab, three- (3-) knot brush, or spray systems. The waterproofing of all types of preformed panels;

5. The application of all types of spray-in-place such as urethane or polyurethane, and the coatings that are



applied over them;

6. The application of roof insulation, when the insulation material is applied as an integral part of the roofing system, whether the insulation material is applied as the first, last, or any other layer in between;

7. The operation and servicing of all kettles, bulk tankers, stationary heating tankers, and other types of equipment and tools used to accomplish this work (including heating systems for the operation of the equipment); and compressors for applying roofing material components, roof and mop carts, hydraulics, tools and equipment, be it hand or power, needed to apply waterproofing, insulated, and roofing materials;

8. The handling, hoisting, and storing of all roofing, damp, and waterproofing materials; and

9. The tear-off, removal, or both, of any type of roofing, all spudding, sweeping, vacuuming, cleanup, or a combination of these, of any areas of any type where a roof is to be relayed;

(R) Sheet Metal Worker—The work falling within the occupational title of sheet metal worker includes:

1. The handling, conditioning, assembling, installing, servicing, repairing, altering, and dismantling of the duct work for the heating, ventilation, and air-conditioning systems regardless of the materials used and the setting of all equipment and all supports and reinforcements in connection with the system;

2. The installation of expansion and discharge valves, air filters, and water filters in heating, ventilation, and air-conditioning systems;

3. The testing and balancing of air-handling equipment and duct work;

4. The forming, rolling, drawing, stamping, or pressing of sheet metal shingles, sheet metal tile, sheet metal brick, sheet metal stone, and sheet metal lumber, when specified for use as roofing, siding, waterproofing, weather proofing, fire proofing, or for ornamental or any other purpose;

5. The performing of sheet metal work specified for use in connection with or incidental to steeples, domes, minarets, look outs, dormers, louvers, ridges, copings, roofing, decking, hips, valleys, gutters, outlets, roof flanges, flashings, gravel stops, leader heads, down spouts, mansards, balustrades, skylights, cornice moulding, columns, capitals, panels, pilasters, mullions, spandrils, and any and all other shapes, forms and design of sheet metal work specified for use for waterproofing, weatherproofing, fire proofing, ornamental, decorative, or display purposes, or as trim on exterior of the buildings;

6. The installing of sheet metal ceilings

with cornices and mouldings of plain, ornamental, enameled, glazed, or acoustic type;

7. The installing of side walls, wainscoting of plain, ornamental, enameled, or glazed types, including sheet metal tile;

8. The application of all necessary wood or metal furring, plastic, or other materials, to which they are directly applied;

9. The performing of sheet-metal work specified for use in connection with or incidental to direct, indirect, or other types of heating, ventilating, air-conditioning, and cooling systems (including risers, stacks, ducts, S strips, fittings, dampers, casings, recess boxes, outlets, radiator enclosures, exhausts, ventilators, frames, grisses, louvers, registers, cabinets, fans, and motors);

10. The air washers, filters, air brushes, housings, air-conditioning chambers;

11. The setting and hanging of air-conditioning units, unit heaters or air-veyor systems, and air handling systems regardless of material used;

12. The assembling and setting up of all cast iron parts, warm air furnace, all stoker, gas, and oil burner equipment used in connection with warm air heating, all sheet metal hoods, casings, wall stacks, smoke pipes, truck lines, cold air intake, air chambers, vent pipes, frames, registers, dampers, and regulation devices;

13. The installing of equipment utilized in the operation of kitchens including ranges, canopies, steam tables, work tables, dishwashers, coffee urns, soda fountains, warming closets, sinks, drainboards, garbage chutes, incinerators, and refrigerators;

14. The installing of tubing, pipes, and fittings, used in connection with or incidental to coppersmithing work. The installation of fume hoods, metal toilet partitions, metal lockers, plain metal shelving; and

15. The handling, moving, hoisting, and storing of all sheet metal materials on the job site, where power equipment and rigging are required;

(S) Sprinkler Fitter—Applies to workers who perform the installation, adjustments, and corrections, repair, and dismantling of all fire protection and fire control systems and the installation of all fire piping for tubing, appurtenances, and equipment. The work falling within the occupational title includes: The handling and installation of all piping and appurtenances pertaining to sprinkler equipment, including both overhead and underground water mains, fire hydrants and hydrant mains, standpipes, and hose connections to the sprinkler systems, sprinkler tank heaters, air lines and thermal systems used in connection with sprinkler and alarm systems, tank and pump connections, and fire protection systems using mulsifyre, spray, water,

fog, carbon dioxide (CO<sub>2</sub>), gas and foam and dry chemical systems; and

(T) Truck Driver (which shall include truck control service driver, truck driver group I, truck driver group II, truck driver group III, and truck driver group IV)—The workers who perform work falling within the occupational title of work description for truck driver includes the operation, repair, and servicing of the following mechanical equipment. This occupational title encompasses several subclassifications, with the title and work description considered in light of whether the public works project pertains to building construction or heavy/highway construction.

1. Building construction. The subtitles falling within the occupational title of work description for truck driver, as applicable to building construction, are as follows:

A. Truck control service driver - Applies to workers who perform work including:

(I) The delivery, installation, and pickup of traffic control devices;

(II) The unloading and installation of barricades, plastic channelizer drums, safety cones, and temporary flashing lights not to exceed one hundred fifteen (115) volts;

(III) Regular periodic inspections to assure that traffic control devices are clean, clearly visible, and properly positioned. Inspection and maintenance includes replacing batteries and bulbs in lights, cleaning reflective material and lenses, and repairing or replacing damaged or missing devices when incidental to and part of a public works construction project; and

(IV) Removal of all traffic control devices by loading them on a truck and driving them to a storage yard where they are unloaded;

B. Group I—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks single axle, station wagons, pick-up trucks, material trucks single axle, tank wagon single axle;

C. Group II—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: agitator and transit mix-trucks;

D. Group III—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks tandem axle, articulated dump trucks, material trucks tandem axle, tank wagon tandem axle; and

E. Group IV—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the



following equipment: semi and/or pole trailers, winch, fork and steel trucks, distributor drivers and operators, tank wagon semi-trailer, Insley wagons, dumpsters, halftracks, speedace, euclids, and other similar equipment, A-frame and Derrick trucks, float or low boy, and boom truck.

2. Heavy/highway construction. The subtitles falling within the occupational title work description for truck driver, as applicable to heavy/highway construction, are as follows:

A. Truck control service driver – Applies to workers who perform work including:

(I) The delivery, installation, and pickup of traffic control devices;

(II) The unloading and installation of barricades, plastic channelizer drums, safety cones, and temporary flashing lights not to exceed one hundred fifteen (115) volts;

(III) Regular periodic inspections to assure that traffic control devices are clean, clearly visible, and properly positioned. Inspection and maintenance includes replacing batteries and bulbs in lights, cleaning reflective material and lenses, and repairing or replacing damaged or missing devices when incidental to and part of a public works construction project; and

(IV) Removal of all traffic control devices by loading them on a truck and driving them to a storage yard where they are unloaded;

B. Group I—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks single axle, station wagons, pick-up trucks, material trucks single axle, tank wagon single axle;

C. Group II—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: agitator and transit mix-trucks;

D. Group III—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: flat bed trucks tandem axle, articulated dump trucks, material trucks tandem axle, tank wagon tandem axle; and

E. Group IV—This subtitle applies to workers who operate, monitor, control, repair, modify, assemble, erect, oil, and service the following equipment: semi-and/or pole trailers, winch, fork and steel trucks, distributor drivers and operators, tank wagon semi-trailer, Insley wagons, dumpsters, halftracks, speedace, euclids, and other similar equipment, A-frame and Derrick trucks, float or low boy, and boom truck.

*AUTHORITY: section 290.240.2., RSMo Supp. 2018.\* Original rule filed Sept. 15, 1992, effective May 6, 1993. Emergency amendment filed April 30, 1993, effective May 10, 1993, expired Aug. 28, 1993. Amended: Filed Aug. 13, 1996, effective Feb. 28, 1997. Amended: Filed Jan. 22, 1997, effective Sept. 30, 1997. Amended: Filed June 17, 2004, effective Dec. 30, 2004. Amended: Filed Aug. 19, 2010, effective Feb. 28, 2011. Amended: Filed Aug. 9, 2012, effective Feb. 28, 2013. Emergency amendment filed Nov. 7, 2014, effective Nov. 17, 2014, expired May 15, 2015. Amended: Filed Nov. 7, 2014, effective April 30, 2015. Emergency amendment filed Nov. 21, 2018, effective Dec. 1, 2018, expired May 29, 2019. Amended: Filed Nov. 21, 2018, effective July 30, 2019.*

*\*Original authority: 290.240, RSMo 1957, amended 1969, 2018.*

*Missouri*  
**Revisor of Statutes**

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**290.010. What constitutes a day's labor.** — From and after the first day of May, in the year eighteen hundred and sixty-seven, the period of eight hours shall be and constitute a legal day's work; but nothing in this section shall be so construed as to prevent parties to any contract for work, services or labor from agreeing upon a longer or shorter time. This section shall not apply to persons hired or employed by the month, nor to laborers or farm hands in the service of farmers or others engaged in agriculture.

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(RSMo 1939 § 10166)

Prior revisions: 1929 § 13205; 1919 § 6766; 1909 § 7812

CROSS REFERENCE:

Election, employees allowed three hours to vote, 115.639

8/28/1939

**290.020. Limitation of working hours in certain industries, exception by consent of worker.** — It is hereby declared to be unlawful for any person, company or corporation engaged in carrying on any kind of mining, mechanical, chemical manufacturing or smelting business, to work their employees in any mill or mills, or plants, while engaged in crushing rocks and mine products, containing mineral or ores, or engaged in separating the minerals or ores from rock and such combination with which the mineral or ores are mixed, or reducing or roasting, or refining or smelting minerals or ores, from and after the time such rocks, or combination of rocks and mine products, or minerals or ores are taken out of the mines, at such labor or industry, for a period of time longer than eight hours in a day of twenty-four hours, without their consent, and it is hereby declared that eight hours shall constitute a day of employment, for all laborers, or employees, engaged in the kind of labor or industry aforesaid.

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(RSMo 1939 § 10167, A.L. 1981 H.B. 748)

Prior revisions: 1929 § 13206; 1919 § 6767; 1909 § 7813

8/28/1981

**290.030. Penalty.** — Any person or persons, company or corporation who shall violate any of the provisions of section 290.020 shall, on conviction, be fined in a sum not less than twenty-five dollars nor more than five hundred dollars.

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(RSMo 1939 § 10168)

Prior revisions: 1929 § 13207; 1919 § 6768; 1909 § 7814

8/28/1939



**290.080. Employees paid semimonthly, exception — statement of deductions — violation, misdemeanor.** — All corporations doing business in this state, and all persons operating railroads or railroad shops in this state, shall pay the wages and salaries of their employees as often as semimonthly, within sixteen days of the close of each payroll period; provided, however, that executive, administrative and professional employees, and sales people and other employees compensated in whole or in part on a commission basis, at the option of such employers, may be paid their salaries or commissions monthly. Such corporations and persons either as a part of the check, draft or other voucher paying the wages or separately, shall furnish the employee at least once a month a statement showing the total amount of deductions for the period. Any corporation or person violating this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than fifty dollars, nor more than five hundred dollars, for each offense.

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(RSMo 1939 §§ 5080, 5081, 10176, A. 1949 S.B. 1105, A.L. 1955 p. 596)

Prior revisions: 1929 §§ 4608, 4609, 13215; 1919 §§ 9802, 9803, 6778; 1909 § 7820

CROSS REFERENCE:

Wages, when to be paid, interest, priority, 430.360

8/28/1955

**290.090. Factory employees paid semimonthly — amount withheld — penalty.** — The employees of the operators of all manufactories, including plate glass manufactories, operated within this state shall be regularly paid in full of all wages due them at least once in every fifteen days, in lawful money, and at no pay day shall there be withheld from the earnings of any employee any sum to exceed the amount due him for his labor for five days next preceding any such pay day. Any such operator who fails and refuses to pay his employees, their agents, assigns or anyone duly authorized to collect such wages, as in this section provided, shall become immediately liable to any such employee, his agents or assigns for an amount double

the sum due such employee at the time of such failure to pay the wages due, to be recovered by civil action in any court of competent jurisdiction within this state, and no employee, within the meaning of this section, shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof.

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(RSMo 1939 § 10175)

Prior revisions: 1929 § 13214; 1919 § 6775; 1909 § 7817

8/28/1939

**290.095. Wage subsidies, bid supplements, and rebates for employment prohibited, when — violation, penalty. —** 1. No contractor or subcontractor may directly or indirectly receive a wage subsidy, bid supplement, or rebate for employment on a public works project if such wage subsidy, bid supplement, or rebate has the effect of reducing the wage rate paid by the employer on a given occupational title below the wage rate required to be paid for such project pursuant to sections [290.210 to 290.340](#).

2. In the event a wage subsidy, bid supplement, or rebate is lawfully provided or received under subsection 1 of this section, the entity receiving such subsidy, supplement, or rebate shall report the date and amount of such subsidy, supplement, or rebate to the public body within thirty days of receipt of payment. This disclosure report shall be a matter of public record under [chapter 610](#).

3. Any employer in violation of this section shall owe to the public body double the dollar amount per hour that the wage subsidy, bid supplement, or rebate has reduced the wage rate paid by the employer below the wage rate required to be paid for such project pursuant to sections [290.210 to 290.340](#) for each hour that work was performed. It shall be the duty of the department to calculate the dollar amount owed to the public body under this section.

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(L. 2007 S.B. 339, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.100. Thirty days' notice of reduction of wages, how. —** Any railway, mining, express, telegraph, manufacturing or other company or corporation doing business in this state, and desiring to reduce the wages of its employees, or any of them, shall give to the employees to be affected thereby thirty days' notice thereof. Such notice may be given by posting a written or printed handbill, specifying the class of employees whose

wages are to be reduced and the amount of the reduction, in a conspicuous place in or about the shops, station, office, depot or other place where said employees may be at work, or by mailing each employee a copy of said notice or handbill, and such company or corporation violating any of the provisions of this section shall forfeit and pay each party affected thereby the sum of fifty dollars, to be recovered by civil action in the name of the injured party, with costs, before any court of competent jurisdiction.

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(RSMo 1939 §§ 5066, 5067, A.L. 1943 p. 410 § 75)

Prior revisions: 1929 §§ 4590, 4591; 1919 §§ 9782, 9783; 1909 §§ 3022, 3023

8/28/1943

**290.110. Payment due discharged employee — exceptions — penalty for delay. —** Whenever any person, firm or corporation doing business in this state shall discharge, with or without cause, or refuse to further employ any servant or employee thereof, the unpaid wages of the servant or employee then earned at the contract rate, without abatement or deduction, shall be and become due and payable on the day of the discharge or refusal to longer employ and the servant or employee may request in writing of his foreman or the keeper of his time to have the money due him, or a valid check therefor, sent to any station or office where a regular agent is kept; and if the money or a valid check therefor, does not reach the station or office within seven days from the date it is so requested, then as a penalty for such nonpayment the wages of the servant or employee shall continue from the date of the discharge or refusal to further employ, at the same rate until paid; provided, such wages shall not continue more than sixty days. This section shall not apply in the case of an employee whose remuneration for work is based primarily on commissions and whose duties include collection of accounts, care of a stock or merchandise and similar activities and where an audit is necessary or customary in order to determine the net amount due.

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(RSMo 1939 § 5082, A.L. 1943 p. 410 § 76, A.L. 1963 p. 414, A.L. 1972 H.B. 1203)

Prior revisions: 1929 § 4610; 1919 § 9804

8/28/1972

**290.120. Employee not entitled to benefits, when. —** No such servant or employee who secretes or absents himself to avoid payment to him, or refuses to receive the same when fully tendered, shall be entitled to any benefit under sections [290.110](#) and [290.120](#) for such time as he so avoids payment.

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(RSMo 1939 § 5083, A.L. 1943 p. 410 § 77)

Prior revisions: 1929 § 4611; 1919 § 9805

8/28/1943



**290.130. Action by employees for breach of employment contract.** — Any such servant or employee whose employment is for a definite period of time, and who is discharged without cause before the expiration of such time, may, in addition to the penalty prescribed by this law, have an action against any such employer for any damages he may have sustained by reason of such wrongful discharge, and such action may be joined with an action for unpaid wages and penalty.

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(RSMo 1939 § 5084, A.L. 1943 p. 410 § 78)

Prior revisions: 1929 § 4612; 1919 § 9806

8/28/1943

**290.140. Letter of dismissal, when — failure to issue, damages — punitive damages, limitations.** — 1. Whenever any employee of any corporation doing business in this state and which employs seven or more employees, who shall have been in the service of said corporation for a period of at least ninety days, shall be discharged or voluntarily quit the service of such corporation and who thereafter within a reasonable period of time, but not later than one year following the date the employee was discharged or voluntarily quit, requests in writing by certified mail to the superintendent, manager or registered agent of said corporation, with specific reference to the statute, it shall be the duty of the superintendent or manager of said corporation to issue to such employee, within forty-five days after the receipt of such request, a letter, duly signed by such superintendent or manager, setting forth the nature and character of service rendered by such employee to such corporation and the duration thereof, and truly stating for what cause, if any, such employee was discharged or voluntarily quit such service.

2. Any corporation which violates the provisions of subsection 1 of this section shall be liable for compensatory but not punitive damages but in the event that the evidence establishes that the employer did not issue the requested letter, said employer may be liable for nominal and punitive damages; but no award of punitive damages under this section shall be based upon the content of any such letter.

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(RSMo 1939 § 5064, A.L. 1941 p. 330, A.L. 1982 S.B. 747)

Prior revisions: 1929 § 4588; 1919 § 9780; 1909 § 3020

CROSS REFERENCE:

## Employee dismissal rights, damage action, time limitation, 516.140

(1985) Actual damages in a "service letter" case are proven by showing that the plaintiff was refused employment or hindered in obtaining employment, due to the absence or inadequacy of a service letter, that the position plaintiff was refused or hindered in obtaining was actually open, and the rate of pay of that position. *Gibson v. Hummel* (Mo. App. E.D.), 688 S.W.2d 4.

(1985) An award of punitive damages based on the failure to provide a service letter is improper except upon a showing of actual or legal malice. *Comerio v. Beatrice Foods Co.*, 616 F.Supp. 1423 (D.C.Mo.).

(1986) An employer which fails to issue the service letter within forty-five days of it being requested may be liable for punitive damages. *Talbert v. Safeway Stores, Inc.* 651 F.Supp. 1563 (W.D. Mo.).

1986) A statement that termination is due to "unsatisfactory work performance" is insufficient as a matter of law under this section. *Gloria v. University of Health Sciences*, 713 S.W.2d 32 (Mo. App. W.D.).

(1987) Legal malice must be proven in order to recover punitive damages pursuant to this section and such malice must be averred generally in the petition. *Willett v. Slay Warehouse Co., Inc.*, 735 S.W.2d 60 (Mo. App. E.D.).

(1987) Legal malice or the deliberate failure to provide a service letter knowing that an individual has requested one perhaps may be shown in order to recover punitive damages by proving that this section was cited in the request for a service letter. *Fink v. Revco Discount Drug Centers, Inc.*, 666 F.Supp. 1325 (W.D. Mo.).

(1990) Letter requesting statement of reasons for employee's discharge signed only by the employee's attorney and not by the employee is not a valid request for a service letter. *Zeman v. V.F. Factory Outlet, Inc.*, 911 F.2d 107 (8th Cir.).

(1990) Discharged employee not entitled to actual damages for an employer's violation of service letter statute for false statements unless employee can show evidence that prospective employer saw letter and held it against employee. Employee could seek nominal damages. *Prewitt v. Factory Motor Parts, Inc.*, 747 F.Supp. 560 (W.D. Mo.).

8/28/1982

**290.145. Discrimination, refusal to hire or discharge employee for alcohol or tobacco use not during working hours, prohibited, exception — not cause for legal actions.** — It shall be an improper employment practice for an employer to refuse to hire, or to discharge, any individual, or to otherwise disadvantage any individual, with respect to compensation, terms or conditions of employment because the individual

uses lawful alcohol or tobacco products off the premises of the employer during hours such individual is not working for the employer, unless such use interferes with the duties and performance of the employee, the employee's coworkers, or the overall operation of the employer's business; except that, nothing in this section shall prohibit an employer from providing or contracting for health insurance benefits at a reduced premium rate or at a reduced deductible level for employees who do not smoke or use tobacco products. Religious organizations and church-operated institutions, and not-for-profit organizations whose principal business is health care promotion shall be exempt from the provisions of this section. The provisions of this section shall not be deemed to create a cause of action for injunctive relief, damages or other relief.

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(L. 1992 S.B. 509, et al. § 6, A.L. 2005 H.B. 596, A.L. 2006 S.B. 567 & 792)

8/28/2006



**290.152. Employer response to request for information about current or former employee, contents, requirements, civil immunity, when.** — 1. As used in this section, the following terms shall mean:

(1) "**Employer**", any individual, organization, partnership, political subdivision, corporation or other legal entity which has or had in the entity's employ one or more individuals performing services for the entity within this state;

(2) "**Prospective employer**", any employer, as defined in this subsection, to which an individual has made application for employment, either oral or written, or forwarded a resume or other correspondence expressing an interest in employment.

2. An employer may:

(1) Respond in writing to a written request concerning a current or former employee from an entity or person which the employer reasonably believes to be a prospective employer of such employee; and

(2) Disclose the nature and character of service rendered by such employee to such employer and the duration thereof; and

(3) Truly state for what cause, if any, such employee was discharged or voluntarily quit such service. The provisions of this section shall apply regardless of whether the employee becomes employed by the prospective employer prior to receipt of the former employer's written response. The information provided pursuant to this section shall be consistent with the content of any service letter provided pursuant to section [290.140](#) for the same employee.

3. The employer shall send a copy of any letter provided pursuant to subsection 2 of this section to the current employee or former employee at the employee's last known address. The current or former employee may request from the employer a copy of the letter provided pursuant to subsection 2 of this section for up to one year following the date of such letter.

4. For purposes of this section, an employer shall be immune from civil liability for any response made pursuant to this section or for any consequences of such response, unless such response was false and made with knowledge that it was false or with reckless disregard for whether such response was true or false.

5. Any employer who violates the provisions of subsection 2 of this section shall be liable for compensatory damages but not punitive damages.

6. Any letter issued pursuant to this section shall not be admitted as evidence in an unemployment compensation claim.

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(L. 1999 S.B. 32)

8/28/1999

**290.210. Definitions.** — As used in sections 290.210 to 290.340, unless the context indicates otherwise, the following terms shall mean:

(1) "**Collective bargaining agreement**", any written agreement or understanding between an employer or employer association and a labor organization or union which is the exclusive bargaining representative of the employer's or employer association's employees pursuant to the terms of the National Labor Relations Act and which agreement or understanding or predecessor agreement or understanding has been used to determine an occupational title wage rate;

(2) "**Construction**", construction, reconstruction, improvement, enlargement, alteration, painting and decorating, or major repair;

(3) "**Department**", the department of labor and industrial relations;

(4) "**Labor organization**" or "**union**", any entity which has been designated pursuant to the terms of the National Labor Relations Act as the exclusive bargaining representative of employees of employers engaged in the construction industry, which entity or affiliated entity has ever had a collective bargaining agreement which determined an occupational title wage rate;

(5) "**Locality**", the county where the physical work upon public works is performed;

(6) "**Maintenance work**", the repair, but not the replacement, of existing facilities when the size, type or extent of the existing facilities is not thereby changed or increased;

(7) "**Prevailing hourly rate of wages**" or "**prevailing wage rate**", the wages paid generally, to workers engaged in work of a similar character in the locality in which the public works is being performed, including the basic hourly rate of pay and the amount of the rate of contributions irrevocably made to a fund, plan or program, and the amount of the rate of costs to the contractor or subcontractor which may be reasonably anticipated in providing benefits to workers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan or program which was communicated in writing to the workmen affected, for medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing, for unemployment benefits, life insurance, disability and sickness insurance, accident insurance, for vacation and holiday pay, for defraying costs of apprenticeship or other similar programs, or for other bona fide fringe benefits, but only where the contractor or subcontractor is not required by other federal or state law to provide any of the benefits; provided, that the obligation of a contractor or subcontractor to make payment in accordance with the prevailing wage determinations of the department, insofar as sections [290.210](#) to [290.340](#) are concerned, may be discharged by the making of payments in cash, by the making of irrevocable contributions by the assumption of an enforceable commitment to bear the costs of a plan or program as provided herein, or any combination thereof, where the aggregate of such payments, contributions and costs is not less than the rate of pay plus the other amounts as provided herein;

(8) "**Public body**", the state of Missouri or any officer, official, authority, board or commission of the state, or other political subdivision thereof, or any institution supported in whole or in part by public funds;

(9) "**Public works**", all fixed works constructed for public use or benefit or paid for wholly or in part out of public funds. It also includes any work done directly by any public utility company when performed by it pursuant to the order of the public service commission or other public authority whether or not it be done under public supervision or direction or paid for wholly or in part out of public funds when let to contract by said utility. It does not include any work done for or by any drainage or levee district;

(10) "**Public works contracting minimum wage**", the wage rate determined by the department pursuant to section [290.257](#);

(11) "**Workers**", laborers and mechanics.

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 (L. 1957 p. 574 § 1, A.L. 1965 p. 438, A.L. 1969 S.B. 142, A.L. 2013 H.B. 34, A.L. 2018 H.B. 1729, et al.)

(1981) Industrial development projects are not subject to the Prevailing Wage Act unless the projects constitute "public works" and involve workmen employed by or on behalf of a public body engaged in public works. *State ex rel. Ashcroft v. City of Sedalia* (Mo. App. W.D.), 629 S.W.2d 578.

8/28/2018

**290.220. Policy declared.** — It is hereby declared to be the policy of the state of Missouri that a wage of no less than 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 public works, exclusive of maintenance work.

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 (L. 1957 p. 574 § 2, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.230. Prevailing wage rates required on construction of public works — who is deemed employed upon public works — inapplicability of prevailing wage, when.**  
 — 1. (1) Except as otherwise provided in this section, not less than 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.

(2) For all work performed on a Sunday or a holiday, not less than twice 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 purposes of this subdivision, "**holiday**" shall include each of the following:

- (a) January first;
- (b) The last Monday in May;
- (c) July fourth;

- (d) The first Monday in September;
- (e) November eleventh;
- (f) The fourth Thursday in November; and
- (g) December twenty-fifth;

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

(3) For all overtime work performed, not less than one and one-half 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

(4) 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.

2. Only workers that are directly employed by contractors or subcontractors in actual construction work on the site of the building or construction job shall be deemed to be employed upon public works.

3. Any worker who agrees in writing to volunteer his or her labor without pay shall not be deemed to be employed upon public works, and shall not be entitled to the wage rates required pursuant to sections [290.210](#) to [290.340](#). For the purposes of this section, the term "**worker who agrees in writing to volunteer his or her labor without pay**" shall mean a worker who volunteers his or her labor without any promise of benefit or remuneration for such voluntary activity, and who is not a prisoner in any jail or prison facility and who is not performing community service pursuant to disposition of a criminal case against him or her, and is not otherwise employed for compensation at any time in the construction or maintenance work on the same public works for which the worker is a volunteer. Under no circumstances may an employer or a public body force, compel or otherwise intimidate a worker into performing work otherwise paid at a prevailing wage rate or at a public works contracting minimum wage rate as a volunteer.

4. When the hauling of materials or equipment includes some phase of construction other than the mere transportation to the site of the construction, workers engaged in

this dual capacity shall be deemed employed directly on public works.

5. (1) The provisions of sections 290.210 to 290.340 shall not apply to the construction of public works for which either the engineer's estimate or the bid accepted by the public body for the total project cost is in the amount of seventy-five thousand dollars or less.

(2) The total project cost shall be based upon the entire project and not individual projects within a larger project.

(3) The total project cost shall include the value of work performed on the project by every person paid by a contractor or subcontractor for that person's work on the project. The total project cost shall additionally include all materials and supplies purchased for the project.

6. A public body shall not divide a project into multiple contracts for the purpose of lowering the total project cost below the threshold described in subsection 5 of this section.

7. For any public works project for which either the engineer's estimate or the bid accepted by the public body for the total project cost is in the amount of seventy-five thousand dollars or less that becomes subject to a change order that increases the total project cost in excess of seventy-five thousand dollars, the provisions of sections 290.210 to 290.340 shall apply only to that portion of the project that was in excess of seventy-five thousand dollars.

8. Notwithstanding any provision of law to the contrary, for the purposes of construction of public works for which either the engineer's estimate or the bid accepted by the public body for the total project cost is in the amount of ten thousand dollars or less for all occupational titles, public bodies shall be exempt from any law requiring the use of competitive bids.

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(L. 1957 p. 574 § 3, A.L. 2014 H.B. 1594, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.235. On-the-job training periods, use of entry-level workers and apprentices — wages — aggregate limit.** — 1. Employers may use entry-level workers and federally registered apprentices for on-the-job training periods. The wage rate for on-the-job training workers shall be equal to fifty percent of the applicable wage rate for a journeyman worker under the appropriate occupational title for a specific locality.

2. The combined total of entry-level workers and federally registered apprentices shall not exceed a one-to-one ratio with the number of journeyman workers in any

occupational title on a public works project subject to sections [290.210 to 290.340](#).

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(L. 2018 H.B. 1729, et al.)

8/28/2018

**290.240. Department inquiry into complaints — rulemaking authority.** — 1. The department shall inquire diligently into complaints regarding any violation of sections [290.210 to 290.340](#), shall institute actions for penalties herein prescribed, and shall enforce generally the provisions of sections [290.210 to 290.340](#). Complaints regarding any violation of sections [290.210 to 290.340](#) shall be filed with the department. The following interested parties are the only parties allowed to file such complaints with the department:

(1) Any decision-making public servant for a public body for which a public works project is being performed, if the complaint is against the contractor or subcontractor for the project;

(2) Any contractor, if the complaint is against his or her subcontractor for work performed on behalf of a public body;

(3) Any subcontractor, if the complaint is against his or her contractor for work performed on behalf of a public body; and

(4) Any worker who alleges a violation of his or her rights under sections [290.210 to 290.340](#).

2. The department may establish rules and regulations for the purpose of carrying out the provisions of sections [290.210 to 290.340](#).

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(L. 1957 p. 574 § 6, A.L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.250. Applicable wage rates, incorporation into contracts — failure to pay, penalty — complaints of violation, public body or prime contractor to withhold payment — determination of a violation, investigation required — employer's right to dispute — enforcement proceeding permitted, when.** — 1. Every public body authorized to contract for or construct public works before advertising for bids or undertaking such construction shall request the department to determine the applicable wage rates in the locality where the work is to be performed. The department shall determine the applicable wage rates in the locality in which the work is to be performed as provided in section [290.257](#). Such determination or schedule of the wage rates shall be attached to and made a part of the specifications for the

work. The public body shall then specify in the resolution or ordinance and in the call for bids for the contract the wage rates in the locality needed to execute the contract. The contractor to whom the contract is awarded and any subcontractor under the contractor shall pay not less than the specified wage rates to all workers employed by them in the execution of the contract. The public body awarding the contract shall cause to be inserted in the contract a stipulation to the effect that not less than the specified wage rates shall be paid to all workers performing work under the contract. The contractor shall forfeit as a penalty to the public body on whose behalf the contract is made or awarded one hundred dollars for each worker employed, for each calendar day, or portion thereof, such worker is paid less than the specified wage rates for any work done under the contract, by the contractor or by any subcontractor under the contractor, and the public body awarding the contract shall cause to be inserted in the contract a stipulation to this effect. The public body awarding the contract, and its agents and officers, shall take cognizance of all complaints of all violations of the provisions of sections [290.210 to 290.340](#) committed in the course of the execution of the contract, and, when making payments to the contractor becoming due under the contract, shall withhold and retain therefrom all sums and amounts due and owing as a result of any violation of sections [290.210 to 290.340](#). Any contractor may withhold from any subcontractor sufficient sums to cover any penalties withheld by the awarding public body on account of the subcontractor's failure to comply with the terms of sections [290.210 to 290.340](#), and if payment has already been made, the contractor may recover from the subcontractor the amount of the penalty in a suit at law.

2. In determining whether a violation of sections [290.210 to 290.340](#) has occurred, and whether a penalty shall be imposed pursuant to subsection 1 of this section, the department shall investigate any complaint made by an interested party listed under section [290.240](#). Upon completing such investigation, the department shall notify the employer of its findings. If the department concludes that a violation of sections [290.210 to 290.340](#) has occurred and a penalty may be due, the department shall notify the employer of such finding by providing a notice of penalty to the employer. Such penalty shall not be due until forty-five days after the date of the notice of the penalty.

3. The employer shall have the right to dispute such notice of penalty in writing to the department within forty-five days of the date of the notice. Upon receipt of this written notice of dispute, the department shall notify the employer of the right to resolve such dispute through arbitration. The state and the employer shall submit to an arbitration process to be established by the department by rule, and in conformance with the guidelines and rules of the American Arbitration Association or other

arbitration process mutually agreed upon by the employer and the state. If at any time prior to the department pursuing an enforcement action to enforce the monetary penalty provisions of subsection 1 of this section against the employer, the employer pays the back wages as determined by either the department or the arbitrator, the department shall be precluded from initiating any enforcement action to impose the monetary penalty provisions of subsection 1 of this section.

4. If the employer fails to pay all wages due as determined by the arbitrator within forty-five days following the conclusion of the arbitration process, or if the employer fails to exercise the right to seek arbitration, the department may then pursue an enforcement action to enforce the monetary penalty provisions of subsection 1 of this section against the employer. If the court orders payment of the penalties as prescribed in subsection 1 of this section, the department shall be entitled to recover its actual cost of enforcement from such penalty amount.

5. Nothing in this section shall be interpreted as precluding an action for enforcement filed by an aggrieved employee as otherwise provided in law.

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(L. 1957 p. 574 § 4, A.L. 1969 S.B. 142, A.L. 2007 S.B. 339, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.257. Determination of prevailing wage — annual calculation — final determination, when — occupational titles, applicability.** — 1. (1) In determining the prevailing wage rate, the department shall accept and consider information submitted in either paper or electronic format regarding local wage rates for construction projects that occurred during the year preceding the annual wage order to be issued, provided that information regarding local wage rates for entry-level workers and federally registered apprentices shall not be considered.

(2) (a) The prevailing wage rate for each occupational title shall be equal to the weighted average wage for that occupational title.

(b) For purposes of this subdivision, the following terms shall mean:

a. "**Reported wage sum**", for each occupational title, the sum of every product of each reported wage rate, which shall include fringe benefits, multiplied by the total number of reportable hours at such wage rate; and

b. "**Weighted average wage**", the reported wage sum for each occupational title divided by the total number of reportable hours for that occupational title.

2. The department shall annually calculate the public works contracting minimum wage in each locality. The public works contracting minimum wage shall be equal to

one hundred twenty percent of the average hourly wage in a particular locality, as determined by the Missouri economic research and information center within the department of economic development, or any successor agency.

3. A final determination of the prevailing hourly rate of wages and the public works contracting minimum wage applicable to every locality to be contained in an annual wage order shall be made annually on or before July 1, 2019, and July first of each year thereafter. The wage order shall remain in effect until superseded by a new annual wage order. The department shall, by March 10, 2019, and March tenth of each year thereafter, make an initial determination of the prevailing wage rate for each occupational title within the locality as well as an initial determination as to the public works contracting minimum wage. Objections may be filed as to any initial determination as provided in section [290.262](#).

4. (1) If the total number of reportable hours that are paid pursuant to a collective bargaining agreement and the total number of reportable hours that are not paid pursuant to a collective bargaining agreement equal or exceed, in the aggregate, one thousand hours for any particular occupational title within a locality, workers engaged in that occupational title in such locality shall be paid the prevailing wage rate determined by the department pursuant to this section.

(2) If the total number of reportable hours that are paid pursuant to a collective bargaining agreement and the total number of reportable hours that are not paid pursuant to a collective bargaining agreement do not equal or exceed, in the aggregate, one thousand hours for any particular occupational title within a locality, workers engaged in that occupational title in such locality shall be paid the public works contracting minimum wage.

5. For purposes of this section, the term "**reportable hours**" shall mean hours reported by a contractor for work performed under such contractor in a particular occupational title within a particular locality.

6. (1) The different types of occupational titles to which sections [290.210 to 290.340](#) shall apply shall be limited to, and shall include, all of the following:

(a) Asbestos worker;

(b) Boilermaker;

(c) Bricklayer;

(d) Carpenter, which shall include pile driver, millwright, lather, and linoleum layer;

- (e) Cement mason, which shall include plasterer;
- (f) Communications technician;
- (g) Electrician;
- (h) Elevator constructor;
- (i) Glazier;
- (j) Ironworker;
- (k) General laborer, including first semi-skilled laborer and second semi-skilled laborer;
- (l) Mason, which shall include marble mason, marble finisher, terrazzo worker, terrazzo finisher, tile setter, and tile finisher;
- (m) Operating engineer, which shall include operating engineer group one, operating engineer group two, operating engineer group three, operating engineer group three-A, operating engineer group four, and operating engineer group five;
- (n) Outside lineman, lineman operator, groundman, lineman tree trimmer, groundman tree trimmer, and any combination thereof;
- (o) Painter;
- (p) Plumber, which shall include pipefitter;
- (q) Roofer;
- (r) Sheet metal worker;
- (s) Sprinkler fitter; and
- (t) Truck driver, which shall include truck control service driver, truck driver group one, truck driver group two, truck driver group three, and truck driver group four.

(2) Each occupational title listed in subdivision (1) of this subsection shall have the same meaning and description as given to such occupational title in 8 CSR 30-3.060.

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(L. 2018 H.B. 1729, et al.)

8/28/2018

**290.260. Determination of hourly rate for heavy and highway construction work, when made, where filed, objections, hearing, determination.** — 1. The department, as it deems necessary, shall from time to time investigate and determine the prevailing hourly rate of wages for heavy and highway construction work in the localities. In doing so, the department shall accept and consider information regarding local wage

rates that is submitted in either paper or electronic formats. A determination applicable to every locality to be contained in a general wage order shall be made annually on or before July first of each year for the Missouri state highways and transportation commission and shall remain in effect until superseded by a new general wage order. In determining prevailing rates, the department shall ascertain and consider the applicable wage rates established by collective bargaining agreements, if any, and the rates that are paid generally within the locality.

2. A certified copy of the determination so made shall be filed immediately with the secretary of state and with the department in Jefferson City. Copies shall be supplied by the department to all persons requesting them within ten days after the filing.

3. At any time within thirty days after the certified copies of the determinations have been filed with the secretary of state and the department, any person who is affected thereby may object in writing to the determination or the part thereof that he deems objectionable by filing a written notice with the department, stating the specific grounds of the objection.

4. Within thirty days of the receipt of the objection, the department shall set a date for a hearing on the objection. The date for the hearing shall be within sixty days of the receipt of the objection. Written notice of the time and place of the hearing shall be given to the objectors at least ten days prior to the date set for the hearing.

5. The department at its discretion may hear each written objection separately or consolidate for hearing any two or more written objections. At the hearing the department shall first introduce in evidence the investigation it instituted and the other facts which were considered at the time of the original determination which formed the basis for its determination. The department, or the objector, or any interested party, thereafter may introduce any evidence that is material to the issues.

6. Within twenty days of the conclusion of the hearing, the department must rule on the written objection and make the final determination that it believes the evidence warrants. Immediately, the department shall file a certified copy of its final determination with the secretary of state and with the department and shall serve a copy of the final determination on all parties to the proceedings by personal service or by registered mail.

7. This final decision of the department of the prevailing wages in the locality is subject to review in accordance with the provisions of [chapter 536](#). Any person affected, whether or not the person participated in the proceedings resulting in the final determination, may have the decision of the department reviewed. The filing of

the final determination with the secretary of state shall be considered a service of the final determination on persons not participating in the administrative proceedings resulting in the final determination.

8. At any time before trial any person affected by the final determination of the department may intervene in the proceedings to review under [chapter 536](#) and be made a party to the proceedings.

9. All proceedings in any court affecting a determination of the department under the provisions of sections [290.210 to 290.340](#) shall have priority in hearing and determination over all other civil proceedings pending in the court, except election contests.

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(L. 1957 p. 574 § 8, A.L. 1965 p. 95, A.L. 1969 S.B. 142, A.L. 2013 H.B. 34)

(1962) The function of the court in reviewing decision of industrial commission fixing hourly wage rate is to decide if the determination was authorized by law and supported by competent and substantial evidence upon the whole record. *United Bro. of Carpenters, etc. v. Industrial Commission (A.)*, 363 S.W.2d 82.

8/28/2013



**290.262. Determination of hourly rate, certification — objections, hearings — final determination — notice to department by public body, when. — 1.** A certified copy of any initial wage determinations made pursuant to section [290.257](#) shall be filed immediately with the secretary of state and with the department in Jefferson City. Copies shall be supplied by the department to all persons requesting them within ten days after the filing.

2. At any time within thirty days after the certified copies of the determinations have been filed with the secretary of state and the department, any person who is affected thereby may object in writing to a determination or a part thereof that he or she deems objectionable by filing a written notice with the department, stating the specific grounds of the objection. If no objection is filed, the determination is final after thirty days.

3. After the receipt of the objection, the department shall set a date for a hearing on the objection. The date for the hearing shall be within sixty days of the receipt of the objection. Written notice of the time and place of the hearing shall be given to the objectors at least ten days prior to the date set for the hearing.

4. The department at its discretion may hear each written objection separately or consolidate for hearing any two or more written objections. At the hearing the department shall first introduce in evidence the investigation it instituted and the other facts which were considered at the time of the original determination which formed the basis for its determination. The department, or the objector, or any interested party, thereafter may introduce any evidence that is material to the issues.

5. Within twenty days of the conclusion of the hearing, the department shall rule on the written objection and make the final determination that it believes the evidence warrants. Immediately, the department shall file a certified copy of its final determination with the secretary of state and with the department and shall serve a copy of the final determination on all parties to the proceedings by personal service or by registered mail.

6. This final decision of the department of the prevailing wages in the locality for each occupational title is subject to review in accordance with the provisions of [chapter 536](#). Any person affected, whether or not the person participated in the proceedings resulting in the final determination, may have the decision of the department reviewed. The filing of the final determination with the secretary of state shall be considered a service of the final determination on persons not participating in the administrative proceedings resulting in the final determination.

7. At any time before trial any person affected by the final determination of the department may intervene in the proceedings to review under [chapter 536](#) and be made a party to the proceedings.

8. Any annual wage order made for a particular occupational title in a locality, that is based on the number of hours worked under a collective bargaining agreement, may be altered once each year, as provided in this subsection. The prevailing wage for each such occupational title may be adjusted on the anniversary date of any collective bargaining agreement which covers all persons in that particular occupational title in the locality in accordance with any annual incremental wage increases set in the collective bargaining agreement. If the prevailing wage for an occupational title is adjusted pursuant to this subsection, the employee's representative or employer in regard to such collective bargaining agreement shall notify the department of this adjustment, including the effective date of the adjustment. The adjusted prevailing wage shall be in effect until the next final annual wage order is issued pursuant to this section. The wage rates for any particular job, contracted and commenced within sixty days of the contract date, which were set as a result of the annual or revised wage order, shall remain in effect for the duration of that particular job.

9. In addition to all other reporting requirements of sections 290.210 to 290.340, each public body which is awarding a contract for a public works project shall, prior to beginning of any work on such public works project, notify the department, on a form prescribed by the department, of the scope of the work to be done, the various types of craftsmen who will be needed on the project, and the date work will commence on the project.

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(L. 1993 H.B. 638, A.L. 2013 H.B. 34, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.263. Wage rates to equal or exceed federal minimum wage.** — The wage rates required to be paid to workers upon public works pursuant to sections 290.210 to 290.340 shall not be less than the minimum wage specified under Section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended.

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.265. Wage rates posted, where.** — A clearly legible statement of all wage rates required to be paid to all workers employed in order to execute the contract and employed on the construction of the public works shall be kept posted in a prominent and easily accessible place at the site thereof by each contractor and subcontractor engaged in the public works projects under sections 290.210 to 290.340 and such notice shall remain posted during the full time that any such worker shall be employed on the public works.

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.270. Declaration as to wages final — maximum wages and hours not limited.** — The finding of the department ascertaining and declaring the prevailing hourly rate of wages and the public works contracting minimum wage shall be final for the locality, unless reviewed under the provisions of sections 290.210 to 290.340. Nothing in sections 290.210 to 290.340, however, shall be construed to prohibit the payment to any worker employed on any public work of more than the prevailing hourly rate of wages or the public works contracting minimum wage. Nothing in sections 290.210 to 290.340 shall be construed to limit the hours of work which may be performed by any worker in any particular period of time.

(L. 1957 p. 574 § 7, A.L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.280. Administration of oaths — subpoenas — enforcement of subpoenas. —** The authorized representative of the department may administer oaths, take or cause to be taken the depositions of witnesses, and require by subpoena the attendance and testimony of witnesses and the production of all books, records, and other evidence relative to any matter under investigation or hearing. The subpoena shall be signed and issued by the department's authorized representative. In case of failure of any person to comply with any subpoena lawfully issued under this section, or on the refusal of any witness to produce evidence or to testify to any matter regarding which he may be lawfully interrogated, the authorized representative of the department may proceed to enforce obedience to the subpoenas in the manner provided by section [536.077](#) for administrative agencies. The authorized representative of the department shall have the power to certify to official acts.

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(L. 1957 p. 574 § 9, A.L. 1961 p. 438)

8/28/1961

**290.290. Contractor's payroll records, contents — affidavit of compliance required — signs on motor vehicles and equipment, requirements — temporary stationary sign, when — exception. —** 1. The contractor and each subcontractor engaged in any construction of public works shall keep full and accurate records clearly indicating the names, occupations and crafts of every worker employed by them in connection with the public work together with an accurate record of the number of hours worked by each worker and the actual wages paid therefor. The payroll records required to be so kept shall be open to inspection by any authorized representative of the contracting public body or of the department at any reasonable time and as often as may be necessary and such records shall not be destroyed or removed from the state for the period of one year following the completion of the public work in connection with which the records are made.

2. Each contractor and subcontractor shall file with the contracting public body upon completion of the public work and prior to final payment therefor an affidavit stating that he or she had fully complied with the provisions and requirements of sections [290.210](#) to [290.340](#), and no public body shall be authorized to make final payment until such affidavit is filed therewith in proper form and order.

3. Each contractor and subcontractor engaged in any construction of public works shall have its name, acceptable abbreviation or recognizable logo and the name of the city and state of the mailing address of the principal office of the company, on each

motor vehicle and motorized self-propelled piece of equipment which is used in connection with such public works project during the time the contractor or subcontractor is engaged on such project. The sign shall be legible from a distance of twenty feet but the size of the lettering need not be larger than two inches. In cases where equipment is leased or where affixing a legible sign to the equipment is impractical, the contractor may place a temporary stationary sign, with the information required pursuant to this subsection, at the main entrance of the construction project in place of affixing the required information on the equipment so long as such sign is not in violation of any state or federal statute, rule or regulation. Motor vehicles which are required to have similar information affixed thereto pursuant to requirements of a regulatory agency of the state or federal government are exempt from the provisions of this subsection.

4. The provisions of subsection 3 of this section shall not apply to construction of public works for which the contract awarded is in the amount of two hundred fifty thousand dollars or less.

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(L. 1957 p. 574 § 5, A.L. 1969 S.B. 142, A.L. 1993 H.B. 416 & 417, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.300. Actions for wages by worker authorized.** — Any worker employed by the contractor or by any subcontractor under the contractor who shall be paid for his or her services in a sum less than the stipulated rates for work done under the contract, shall have a right of action for double whatever difference there may be between the amount so paid and the rates provided by the contract together with a reasonable attorney's fee to be determined by the court, and an action brought to recover same shall be deemed to be a suit for wages, and any and all judgments entered therein shall have the same force and effect as other judgments for wages.

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(L. 1957 p. 574 § 10, A.L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.305. Rebates by workers prohibited, exception.** — No person, firm or corporation shall violate the wage provisions of any contract contemplated in sections [290.210 to 290.340](#) or suffer or require any employee to work for less than the rate of wages so fixed, or violate any of the provisions contained in sections [290.210 to 290.340](#). Where workers are employed and their rate of wages has been determined as provided in sections [290.210 to 290.340](#), no person, either on his or her behalf or for

any other person, shall request, demand or receive, either before or after such worker is engaged, that such worker pay back, return, donate, contribute, or give any part or all of said worker's wages, salary, or thing of value, to any person, upon the statement, representation, or understanding that failure to comply with such request or demand will prevent such worker from procuring or retaining employment, and no person shall, directly or indirectly, pay, request or authorize any other person to violate this section. This section shall not apply to any agent or representative of a duly constituted labor organization acting in the collection of dues or assessments of such organization.

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.315. Deductions from wages, agreement to be written, approval of public body required.** — All contractors and subcontractors subject to sections [290.210 to 290.340](#) shall make full payment of the required wages in legal tender, without any deduction for food, sleeping accommodations, transportation, use of small tools, or any other thing of any kind or description. This section shall not apply where the employer and employee enter into an agreement in writing at the beginning of said term of employment covering deductions for food, sleeping accommodations, or other similar items, provided such agreement is submitted by the employer to the public body awarding the contract and the same is approved by such public body as fair and reasonable.

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.320. Advertising for bids before wage rates are determined prohibited.** — No public body, officer, official, member, agent or representative authorized to contract for public works shall fail, before advertising for bids or contracting for such construction, to have the department determine the wage rates in the locality where the work is to be performed as provided in sections [290.210 to 290.340](#).

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.325. Awarding contract or payment without wage rate determination prohibited.** — No public body, officer, official, member, agent or representative thereof authorized to contract for public works shall award a contract for the

construction of such improvement or disburse any funds on account of the construction of such public improvement, unless such public body has first had the department determine the rates of wages required to be paid in the locality where the work is to be performed and such determination has been made a part of the specifications and contract for such public works.

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018

**290.330. Convicted violators of sections 290.210 to 290.340 listed, effect of.** — The department after investigation, upon complaint made by an interested party listed under section [290.240](#) or upon its own initiative, shall file with the secretary of state a list of the contractors and subcontractors who it finds have been prosecuted and convicted for violations of sections [290.210 to 290.340](#) and such contractor or subcontractor, or simulations thereof, shall be prohibited from contracting directly or indirectly with any public body for the construction of any public works or from performing any work on the same as a contractor or subcontractor for a period of one year from the date of the first conviction for such violation and for a period of three years from the date of each subsequent violation and conviction thereof. No public body shall award a contract for a public works to any contractor or subcontractor, or simulation thereof, during the time that its name appears on said list. The filing of the notice of conviction with the secretary of state shall be notice to all public bodies and their officers, officials, members, agents and representatives.

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(L. 1969 S.B. 142, A.L. 2018 H.B. 1729, et al.)

8/28/2018



**290.335. Notice of violation, failure to comply, attorney general shall sue, injunctive relief authorized.** — If it is found that a public body, contractor or subcontractor has not complied with any of the terms of sections [290.210 to 290.340](#), the department shall give notice of the precise violation in writing to such public body, contractor or subcontractor. Sufficient time may be allowed for compliance therewith as the department deems necessary. After the expiration of the time prescribed in said notice, the department may in writing inform the attorney general of the fact that such notice has been given and that the public body, contractor or subcontractor or the authorized representative or agent thereof to whom it was directed has not complied with such notice. Upon receipt thereof, the attorney general shall at the earliest possible time bring suit in the name of the state in the circuit court of the county in

which such public body is located or where any such contractor or subcontractor is engaged in any public works to enjoin the award of such contract for a public works, or any further work or payments thereunder if the contract has been awarded, until the requirements of such notice are fully complied with. The court may issue a temporary restraining order with due notice to the defendant in such action. The plaintiff shall in any such injunctive action post an adequate bond to be set by the circuit judge. Upon final hearing thereof, if the court is satisfied that the requirements of the notice by the department to the defendant were not unreasonable or arbitrary, it shall issue an order enjoining the awarding of such contract for a public works, or any further work or payments thereunder if the contract has been awarded, until the notice is fully complied with. Such injunction shall continue operative until the court is satisfied that the requirements of such notice have been complied with and the court shall have and exercise with respect to the enforcement of such injunctions all the power in it in other similar cases. Both the plaintiff and defendant in such action have the same rights of appeal as are provided by law in other injunction proceedings.

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(L. 1969 S.B. 142)

8/28/1969

**290.340. Penalty for violation.** — Any officer, official, member, agent or representative of any public body, contractor or subcontractor who willfully violates and omits to comply with any of the provisions and requirements of sections [290.210](#) to [290.340](#) shall be punished for each violation thereof by a fine not exceeding five hundred dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment. Each day such violation or omission continues shall constitute a separate offense as contemplated by this section.

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(L. 1969 S.B. 142)

8/28/1969

**290.350. Request for arbitration, when, how made — board to be appointed.** — Whenever a dispute exists concerning wages, hours of labor, or conditions of employment of members of a paid fire department of any county, city, town, fire district, or other governmental unit having a population in excess of twenty thousand or located in a county of the first class, and a request for arbitration is made by either party to the dispute, a firemen's arbitration board shall be appointed as provided in sections [290.350](#) to [290.380](#). Request for arbitration may be made by written petition signed by at least fifty-one percent of the employees of the fire department or by

resolution of the county commission, council, board, or other governing body having direction and control over the fire department.

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(L. 1963 p. 415 § 1)

(1968) As applied to constitutional charter cities, §§ 290.350 and 290.360 are unconstitutional and void as imposing duties upon a municipal officer. State ex rel. Burke v. Cervantes, 423 S.W.2d 791 (Mo.).

8/28/1963



**290.360. Board members — selected, how — officers.** — The board shall consist of five members, four of whom shall be appointed by the chief executive officer of the county, city, town, fire district, or other governmental unit involved, and shall be qualified voters of the county, city, town, fire district, or other governmental unit involved. Two of these appointments shall be made from a list of four or more, submitted by the employees. If the request for arbitration is initiated by petition of the employees, the petition shall be accompanied by a list of four or more persons. If the request for arbitration is initiated by the county commission, council, board or other governing body having direction and control over the fire department, the chief executive officer of the county, city, town, fire district, or other governmental unit shall mail a copy of the resolution, together with a request for the submission of a list of four or more prospective members of the firemen's arbitration board to representatives of the employees of the fire department. The four members appointed by the chief executive officer shall select the fifth member of the board, who may or may not be a registered voter of the county, city, town, fire district, or other governmental unit involved. The board shall meet and organize as soon as possible after its appointment. The board shall select from its membership a chairman and any other officers it considers necessary, and make rules of procedure governing its hearings.

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(L. 1963 p. 415 § 2)

(1968) As applied to constitutional charter cities, §§ 290.350 and 290.360, RSMo, are unconstitutional and void as imposing duties upon a municipal officer. State ex rel. Burke v. Cervantes, 423 S.W.2d 791 (Mo.).

8/28/1963

**290.370. Hearing and recommendations of board.** — The board shall conduct hearings, with dispatch, for the purpose of hearing evidence relevant to the subject of the dispute, and shall, as soon as practicable, report its findings and recommendations in writing to the chief executive officer of the county, city, town, fire district, or other

governmental unit involved, and to any organization of firemen involved. The report shall be concurred in by at least three members of the board. The recommendation shall be advisory only and shall not be binding upon the county, city, town, fire district, or other governmental unit, or upon the members of the fire department involved.

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(L. 1963 p. 415 § 3)

8/28/1963

**290.380. Expenses of board members to be paid.** — Members of the board shall serve without compensation. All necessary expenses of any hearing conducted by the board members, certified to by all the members of the board, shall be paid by the county, city, town, fire district, or other governmental unit involved.

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(L. 1963 p. 415 § 4)

8/28/1963



**290.400. Definitions.** — As used in sections [290.400](#) to [290.450](#) the following words have the meanings indicated unless the context clearly requires otherwise:

- (1) "**Commission**", the labor and industrial relations commission of Missouri;
- (2) "**Employee**", every woman or man in receipt of or entitled to compensation for labor performed for any employer;
- (3) "**Employer**", every person, firm, corporation, agent, manager, representative, contractor, subcontractor, principal or other person having control or direction of any woman or man employed at any labor, or responsible directly or indirectly for the wages of another;
- (4) "**Female**", a woman of eighteen years or over;
- (5) "**Wage rates**" or "**wages**", any compensation for labor measured by time, piece, or otherwise.

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(L. 1963 p. 416 § 1)

8/28/1963

**290.410. Employer not to pay female lower wage.** — Notwithstanding any other provisions of the law, no employer shall pay any female in his employ at wage rates less than the wage rates paid to male employees in the same establishment for the same quantity and quality of the same classification of work, provided that nothing herein shall prohibit a variation of rates of pay for male and female employees

engaged in the same classification of work based upon a difference in seniority, length of service, ability, skill, difference in duties or services performed, difference in the shift or time of day worked, hours of work, or restrictions or prohibitions on lifting or moving objects in excess of specified weight, or other reasonable differentiation, or factors other than sex, when exercised in good faith.

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(L. 1963 p. 416 § 2)

8/28/1963

**290.420. Female may register complaint.** — Any affected female employee may register with the commission a complaint that the wages paid to her are less than the wages to which she is entitled under sections [290.400 to 290.450](#).

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(L. 1963 p. 416 § 4)

8/28/1963



**290.430. Labor and industrial relations commission to mediate wage disputes.** — The commission shall take all proceedings necessary to mediate the dispute concerning the payment of any sums alleged to be due and unpaid to the female employees. The commission shall have the power to issue such regulations not inconsistent with the purpose and provisions of sections [290.400 to 290.450](#), as it deems necessary or appropriate for the administration thereof.

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(L. 1963 p. 416 § 5, A.L. 1965 p. 95)

8/28/1965

**290.440. Female may recover wages, when — burden of proof.** — 1. Any employer who violates section [290.410](#) is liable to the female employee affected in the amount of the wages of which the female employee is deprived by reason of the violation.

2. Any female employee receiving less than the wage to which she is entitled under sections [290.400 to 290.450](#) may recover in a civil action the balance of the wages, together with the costs of suit, notwithstanding any agreement to work for a lesser wage.

3. The burden of proof shall be upon the person bringing the claim to establish that the differentiation in rate of pay is based upon the factor of sex and not upon other differences or factors.

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(L. 1963 p. 416 §§ 3, 6, 8)

8/28/1963

**290.450. Actions to be instituted in circuit court — limitations.** — Any action based upon or arising under sections 290.400 to 290.450 shall be instituted in the circuit court within six months after the date of the alleged violation, but in no event shall any employer be liable for any pay due under sections 290.400 to 290.450 for more than thirty days prior to receipt by the employer of written notice of claim thereof from the female employee.

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(L. 1963 p. 416 § 7)

8/28/1963



**290.460. Powers and duties of commission.** — The commission shall carry on a continuing program of education, information, study, and community organization concerning the problems of female employees in seeking, obtaining and holding employment without discrimination on account of sex. The commission's power and duties shall include but not be limited to the following:

- (1) Promote in cooperation with the federal government, state, local and private agencies and organizations, programs to eliminate discrimination in employment based solely on sex;
- (2) Promote research with the view to reducing barriers based solely on sex in the hire, employment and retention of female employees;
- (3) Sponsor and correlate in communities of the state, information and educational programs intended to reduce or abolish discrimination in employment based solely on sex;
- (4) Recommend to the governor, from time to time, any specific proposals for legislation as may be deemed necessary and proper for the elimination in employment of discrimination based solely on sex.

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(L. 1965 p. 439)

8/28/1965

**290.500. Definitions.** — As used in sections 290.500 to 290.530, the following words and phrases mean:

- (1) "**Agriculture**", farming and all its branches including, but not limited to, the cultivation and tillage of the soil, dairying, the production, cultivation, growing and harvesting of any agricultural commodities, the raising of livestock, fish and other marine life, bees, fur-bearing animals or poultry and any practices performed by a farmer or on a farm as an incident to or in conjunction with farming operations,

including preparation for market, delivery to storage or to market or to carriers for transportation to market;

(2) "**Director**", the director of the department of labor and industrial relations or his authorized representative;

(3) "**Employee**", any individual employed by an employer, except that the term "employee" shall not include:

(a) Any individual employed in a bona fide executive, administrative, or professional capacity;

(b) Any individual engaged in the activities of an educational, charitable, religious, or nonprofit organization where the employer-employee relationship does not, in fact, exist or where the services rendered to the organization are on a voluntary basis;

(c) Any individual standing in loco parentis to foster children in their care;

(d) Any individual employed for less than four months in any year in a resident or day camp for children or youth, or any individual employed by an educational conference center operated by an educational, charitable or not-for-profit organization;

(e) Any individual engaged in the activities of an educational organization where employment by the organization is in lieu of the requirement that the individual pay the cost of tuition, housing or other educational fees of the organization or where earnings of the individual employed by the organization are credited toward the payment of the cost of tuition, housing or other educational fees of the organization;

(f) Any individual employed on or about a private residence on an occasional basis for six hours or less on each occasion;

(g) Any handicapped person employed in a sheltered workshop, certified by the department of elementary and secondary education;

(h) Any person employed on a casual basis to provide baby-sitting services;

(i) Any individual employed by an employer subject to the provisions of part A of subtitle IV of title 49, United States Code, 49 U.S.C. §§ 10101 et seq.;

(j) Any individual employed on a casual or intermittent basis as a golf caddy, newsboy, or in a similar occupation;

(k) Any individual whose earnings are derived in whole or in part from sales commissions and whose hours and places of employment are not substantially controlled by the employer;

(l) Any individual who is employed in any government position defined in 29 U.S.C. §§ 203(e)(2)(C)(i)-(ii);

(m) Any individual employed by a retail or service business whose annual gross volume sales made or business done is less than five hundred thousand dollars;

(n) Any individual who is an offender, as defined in section 217.010, who is incarcerated in any correctional facility operated by the department of corrections, including offenders who provide labor or services on the grounds of such correctional facility pursuant to section 217.550;

(o) Any individual described by the provisions of section 29 U.S.C. 213(a) (8);

(4) "**Employer**", any person acting directly or indirectly in the interest of an employer in relation to an employee;

(5) "**Learner and apprentice**", any individual under 20 years of age who has not completed the required training for a particular job. In no event shall the individual be deemed a learner or apprentice in the occupation after three months of training except where the director finds, after investigation, that for the particular occupation a minimum of proficiency cannot be acquired in three months. In no case shall a person be declared to be a learner or apprentice after six months of training for a particular employer or job. Employees of an amusement or recreation business that meets the criteria set out in 29 U.S.C. § 213(a) (3) may be deemed a learner or apprentice for ninety working days. No individual shall be deemed a learner or apprentice solely for the purpose of evading the provisions of sections 290.500 to 290.530;

(6) "**Occupation**", any occupation, service, trade, business, industry, or branch or group of industries or employment or class of employment in which individuals are gainfully employed;

(7) "**Wage**", compensation due to an employee by reason of his employment, payable in legal tender of the United States or checks on banks convertible into cash on demand at full face value;

(8) "**Person**", any individual, partnership, association, corporation, business, business trust, legal representative, or any organized group of persons;

(9) "**Man-day**", any day during which an employee performs any agricultural labor for not less than one hour.

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(L. 1990 H.B. 1881 § 1, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.502. Minimum wage rate — increase or decrease, when.** — 1. Except as may be otherwise provided pursuant to sections 290.500 to 290.530, effective January 1, 2007, every employer shall pay to each employee wages at the rate of \$6.50 per hour, or wages at the same rate or rates set under the provisions of federal law as the prevailing federal minimum wage applicable to those covered jobs in interstate commerce, whichever rate per hour is higher.

2. The minimum wage shall be increased or decreased on January 1, 2008, and on January 1 of successive years, by the increase or decrease in the cost of living. On September 30, 2007, and on each September 30 of each successive year, the director shall measure the increase or decrease in the cost of living by the percentage increase or decrease as of the preceding July over the level as of July of the immediately preceding year of the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) or successor index as published by the U.S. Department of Labor or its successor agency, with the amount of the minimum wage increase or decrease rounded to the nearest five cents.

3. Except as may be otherwise provided pursuant to sections 290.500 to 290.530, and notwithstanding subsection 1\* of this section, effective January 1, 2019, every employer shall pay to each employee wages at the rate of not less than \$8.60 per hour, or wages at the same rate or rates set under the provisions of federal law as the prevailing federal minimum wage applicable to those covered jobs in interstate commerce, whichever rate per hour is higher. Thereafter, the minimum wage established by this subsection shall be increased each year by \$.85 per hour, effective January 1 of each of the next four years, until it reaches \$12.00 per hour, effective January 1, 2023. Thereafter, the minimum wage established by this subsection shall be increased or decreased on January 1, 2024, and on January 1 of successive years, per the method set forth in subsection 2\*\* of this section. If at any time the federal minimum wage rate is above or is thereafter increased above the minimum wage then in effect under this subsection, the minimum wage required by this subsection shall continue to be increased pursuant to this subsection \*\*\*, but the higher federal rate shall immediately become the minimum wage required by this subsection and shall be increased or decreased per the method set forth in subsection 2\*\* for so long as it remains higher than the state minimum wage required and increased pursuant to this subsection.

4. For purposes of this section, the term "**public employer**" means an employer that is the state or a political subdivision of the state, including a department, agency, officer, bureau, division, board, commission, or instrumentality of the state, or a city,

county, town, village, school district, or other political subdivision of the state. Subsection 3\*\*\*\* of this section shall not apply to a public employer with respect to its employees. Any public employer that is subject to subsections 1\* and 2\*\* of this section shall continue to be subject to those subsections.

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(L. 1990 H.B. 1881 § 2, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2018 Adopted by Initiative, Proposition B, November 6, 2018)

Effective 11-06-18

\*Words "subsection (1)" appear in original rolls.

\*\*Words "subsection (2)" appear in original rolls.

\*\*\*Number "(3)" appears here in original rolls.

\*\*\*\*Words "subsection (3)" appear in original rolls.

11/6/2018



**290.505. Overtime compensation, applicable number of hours, exceptions. —**

1. No employer shall employ any of his employees for a workweek longer than forty hours unless such employee receives compensation for his employment in excess of the hours above specified at a rate not less than one and one-half times the regular rate at which he is employed.

2. Employees of an amusement or recreation business that meets the criteria set out in 29 U.S.C. 213(a)(3) must be paid one and one-half times their regular compensation for any hours worked in excess of fifty-two hours in any one-week period.

3. With the exception of employees described in subsection (2), the overtime requirements of subsection (1) shall not apply to employees who are exempt from federal minimum wage or overtime requirements including, but not limited to, the exemptions or hour calculation formulas specified in 29 U.S.C. Sections 207 and 213, and any regulations promulgated thereunder.

4. Except as may be otherwise provided under sections [290.500 to 290.530](#), this section shall be interpreted in accordance with the Fair Labor Standards Act, 29 U.S.C. Section 201, et seq., as amended, and the Portal to Portal Act, 29 U.S.C. Section 251, et seq., as amended, and any regulations promulgated thereunder.

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(L. 1990 H.B. 1881 § 3, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2008 H.B. 1883 merged with H.B. 2041)

Effective 6-25-08 (H.B. 2041); 8-28-08 (H.B. 1883)

8/28/2008

**290.507. Agriculture, law not applicable.** — Sections 290.500 to 290.530 shall not apply to any employee or employer engaged in agriculture, as defined in section 290.500 (A) if such employee is employed by an employer who did not, during any calendar quarter during the preceding calendar year, use more than five hundred man-days of agriculture labor, (B) if such employee is the parent, spouse, child, or other member of his employer's immediate family, (C) if such employee (i) is employed as a hand harvest laborer and is paid on a piece rate basis in an operation which has been, and is customarily and generally recognized as having been, paid on a piece rate basis in the region of employment, (ii) commutes daily from his permanent residence to the farm on which he is so employed, and (iii) has been employed in agriculture less than thirteen weeks during the preceding calendar year, (D) if such employee (other than an employee described in clause (C) of this subsection) (i) is sixteen years of age or under and is employed as a hand harvest laborer, is paid on a piece rate basis in an operation which has been, and is customarily and generally recognized as having been, paid on a piece rate basis in the region of employment, (ii) is employed on the same farm as his parent or person standing in the place of his parent, and (iii) is paid at the same piece rate as employees over age sixteen are paid on the same farm, or (E) if such employee is principally engaged in the range production of livestock.

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(L. 1990 H.B. 1881 § 4, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.510. Director may investigate to prove compliance.** — The director shall have authority to investigate and ascertain the wages of persons employed in any occupation included within the meaning of sections 290.500 to 290.530.

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(L. 1990 H.B. 1881 § 5, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006



**290.512. Gratuities, goods or services as part of wages, effect on minimum wage requirements.** — 1. No employer of any employee who receives and retains compensation in the form of gratuities in addition to wages is required to pay wages in excess of fifty percent of the minimum wage rate specified in sections 290.500 to 290.530, however, total compensation for such employee shall total at least the minimum wage specified in sections 290.500 to 290.530, the difference being made up by the employer.

2. If an employee receives and retains compensation in the form of goods or services as an incident of his employment and if he is not required to exercise any discretion in order to receive the goods or services, the employer is required to pay only the difference between the fair market value of the goods and services and the minimum wage otherwise required to be paid by sections 290.500 to 290.530. The fair market value of the goods and services shall be computed on a weekly basis. The director shall provide by regulation a method of valuing the goods and services received by any employee in lieu of the wages otherwise required to be paid under the provisions of sections 290.500 to 290.530. He shall also provide by regulation a method of determining those types of goods and services that are an incident of employment the receipt of which does not require any discretion on the part of the employee.

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(L. 1990 H.B. 1881 § 6, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.515. Physical or mental deficiency of employee, wage rate, determined by director, how.** — After a public hearing at which any person may be heard, the director shall provide by regulation for the employment in any occupation of individuals whose earning capacity is impaired by physical or mental deficiency at wages lower than the wage rate applicable under sections 290.500 to 290.530. The individuals shall be employed as the director finds appropriate to prevent curtailment of opportunities for employment, to avoid undue hardship, and to safeguard the wage rate applicable under sections 290.500 to 290.530, except that no individual who maintains a production level within the limits required of other employees shall be paid less than the wage rate applicable under sections 290.500 to 290.530. Employees affected or their guardians shall be given reasonable notice of this hearing.

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(L. 1990 H.B. 1881 § 7, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.517. Learners and apprentices, wage rate, determined by director, how.** — After a public hearing of which individual employees affected must be given reasonable notice, the director shall provide by regulation for the employment in any occupation, at wages lower than the wage rate applicable under sections 290.500 to 290.530, of such learners and apprentices as he finds appropriate to prevent curtailment of opportunities for employment. Such wage rate for learners and apprentices shall be not less than 90 cents less than the minimum wage established by

sections [290.500 to 290.530](#). At no time may this provision be used for the purpose of evading the spirit and meaning of sections [290.500 to 290.530](#).

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(L. 1990 H.B. 1881 § 8, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006



**290.520. Employer to keep records — director may inspect, records to be confidential.** — Every employer subject to any provision of sections [290.500 to 290.530](#) or any regulation issued under sections [290.500 to 290.530](#) shall make and keep for a period of not less than three years on or about the premises wherein any employee is employed or at some other premises which is suitable to the employer, a record of the name, address and occupation of each of his employees, the rate of pay, the amount paid each pay period to each employee, the hours worked each day and each workweek by the employee and any goods or services provided by the employer to the employee as provided in section [290.512](#). The records shall be open for inspection by the director by appointment. Where the records required under this section are kept outside the state, the records shall be made available to the director upon demand. Every such employer shall furnish to the director on demand a sworn statement of time records and information upon forms prescribed or approved by the director. All the records and information obtained by the department of labor and industrial relations are confidential and shall be disclosed only on order of a court of competent jurisdiction.

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(L. 1990 H.B. 1881 § 9, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.522. Summary of law and wage rate, employer to post, how.** — Every employer subject to any provision of sections [290.500 to 290.530](#) or of any regulations issued under sections [290.500 to 290.530](#) shall keep a summary of sections [290.500 to 290.530](#), approved by the director, and copies of any applicable wage regulations issued under sections [290.500 to 290.530](#), or a summary of the wage regulations posted in a conspicuous and accessible place in or about the premises wherein any person subject thereto is employed. Employers shall be furnished copies of the summaries and regulations by the state on request without charge.

(L. 1990 H.B. 1881 § 10, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.523. Rulemaking authority.** — The department may, in accordance with [chapter 536](#), promulgate such rules and regulations as are necessary for the enforcement and administration of sections [290.500 to 290.530](#). Any rule or portion of a rule, as that term is defined in section [536.010](#), that is created under the authority delegated in this section shall become effective only if it complies with and is subject to all of the provisions of [chapter 536](#) and, if applicable, section [536.028](#). This section and [chapter 536](#) are nonseverable and if any of the powers vested with the general assembly pursuant to [chapter 536](#) to review, to delay the effective date, or to disapprove and annul\* a rule are subsequently held unconstitutional, then the grant of rulemaking authority and any rule proposed or adopted after August 28, 2008, shall be invalid and void.

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(L. 2008 H.B. 1883 merged with H.B. 2041)

\*Word "annual" appears in original rolls of H.B. 1883, 2008.

8/28/2008



**290.525. Violations — penalty.** — Any employer who hinders the director in the performance of his duties in the enforcement of sections [290.500 to 290.530](#) by any of the following acts is guilty of a class C misdemeanor:

- (1) Refusing to admit the director to any place of employment;
- (2) Failing to make, keep and preserve any records as required under the provisions of sections [290.500 to 290.530](#);
- (3) Falsifying any record required under the provisions of sections [290.500 to 290.530](#);
- (4) Refusing to make any record required under the provisions of sections [290.500 to 290.530](#) accessible to the director;
- (5) Refusing to furnish a sworn statement of any record required under the provisions of sections [290.500 to 290.530](#) or any other information required for the proper enforcement of sections [290.500 to 290.530](#) to the director upon demand;
- (6) Failing to post a summary of sections [290.500 to 290.530](#) or a copy of any applicable regulation as required;

(7) Discharging or in any other manner discriminating against any employee who has notified the director that he has not been paid wages in accordance with the provisions of sections 290.500 to 290.530, or who has caused to be instituted any proceeding under or related to sections 290.500 to 290.530, or who has testified or is about to testify in any such proceeding;

(8) Paying or agreeing to pay wages at a rate less than the rate applicable under sections 290.500 to 290.530. Payment at such rate for any week or portion of a week constitutes a separate offense as to each employee;

(9) Otherwise violating any provisions of sections 290.500 to 290.530.

Each day of violation constitutes a separate offense.

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(L. 1990 H.B. 1881 § 11, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.527. Action for underpayment of wages, employee may bring — limitation. —** Any employer who pays any employee less wages than the wages to which the employee is entitled under or by virtue of sections 290.500 to 290.530 shall be liable to the employee affected for the full amount of the wage rate and an additional amount equal to twice the unpaid wages as liquidated damages, less any amount actually paid to the employee by the employer and for costs and such reasonable attorney fees as may be allowed by the court or jury. The employee may bring any legal action necessary to collect the claim. Any agreement between the employee and the employer to work for less than the wage rate shall be no defense to the action. All actions for the collection of any deficiency in wages shall be commenced within three years of the accrual of the cause of action.

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(L. 1990 H.B. 1881 § 12, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2018 Adopted by Initiative, Proposition B, November 6, 2018)

Effective 11-06-18

11/6/2018

**290.528. Minimum wage and employment benefits, limitations on political subdivisions. —** 1. As used in this section, the following terms shall mean:

(1) "Employee", an individual employed in this state by an employer;

(2) "Employer", any individual, sole proprietorship, partnership, limited liability company, corporation, or any other entity that is legally doing business in this state;

except that, the term "employer" shall not include any public employer, as defined in section [285.525](#);

(3) "**Employment benefits**", anything of value that an employee may receive from an employer in addition to wages and salary. The term includes, but is not limited to, health, disability, retirement, profit-sharing, and death benefits; group accidental death and dismemberment benefits; paid or unpaid days off from work for holidays, sick leave, vacation, and personal necessity; and terms of employment, attendance, or leave policies;

(4) "**Political subdivision**", any municipality, special district, local governmental body, county, city, town, or village.

2. Notwithstanding any other provisions of law to the contrary, no political subdivision shall establish, mandate, or otherwise require an employer to provide to an employee:

- (1) A minimum or living wage rate; or
- (2) Employment benefits;

that exceed state laws, rules, or regulations. Sections [290.500 to 290.530](#) shall preempt and nullify all political subdivision ordinances, rules, and regulations currently in effect or later enacted relating to the establishment or enforcement of a minimum or living wage or the provision of employment benefits that exceed state laws, rules, or regulations.

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(L. 1990 H.B. 1881 § 13, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006, A.L. 2017 H.B. 1194 & 1193)

8/28/2017



**290.529. Severability clause.** — Except in the circumstances set forth in section [290.523](#), all the provisions of sections [290.500 to 290.530](#) are severable. If any provision, including any section, subsection, subdivision, paragraph, sentence, or clause, of sections [290.500 to 290.530](#), or the application thereof to any person or circumstance, is found by a court of competent jurisdiction to be invalid, unconstitutional, or unconstitutionally enacted, such decision shall not affect other provisions or applications of sections [290.500 to 290.530](#) that can be given effect without the invalid, unconstitutional, or unconstitutionally enacted provision or application.

(L. 2018 Adopted by Initiative, Proposition B, November 6, 2018)

Effective 11-06-18

11/6/2018

**290.530. Law not to interfere with collective bargaining rights.** — Nothing in sections [290.500 to 290.530](#) shall be deemed to interfere with, impede, or in any way diminish the right of employees to bargain collectively with their employers through representatives of their own choosing in order to establish wages or other conditions of work in excess of the applicable minimum under the provisions of sections [290.500 to 290.530](#).

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(L. 1990 H.B. 1881 § 14, A.L. 2006 Adopted by Initiative, Proposition B, November 7, 2006)

12/7/2006

**290.550. Definitions.** — As used in sections [290.550 to 290.580](#), the following terms mean:

(1) "**Laborers from nonrestrictive states**", persons who are residents of a state which has not enacted state laws restricting Missouri laborers from working on public works projects in that state, as determined by the labor and industrial relations commission;

(2) "**Missouri laborer**", any person who has resided in Missouri for at least thirty days and intends to become or remain a Missouri resident;

(3) "**A period of excessive unemployment**", any month immediately following two consecutive calendar months during which the level of unemployment in the state has exceeded five percent as measured by the United States Bureau of Labor Statistics in its monthly publication of employment and unemployment figures;

(4) "**Public works**", projects defined as public works pursuant to section [290.210](#).

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(L. 1993 H.B. 416 & 417 § 1)

8/28/1993



**290.555. Law to apply to certain projects.** — Sections [290.550 to 290.580](#) apply to all labor on public works projects or improvements, whether skilled, semiskilled or unskilled, and whether manual or nonmanual except work done directly by any public utility company and not let to contract.

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(L. 1993 H.B. 416 & 417 § 2)

8/28/1993

**290.560. Certain laborers to be used on public works projects, when — contract provisions — exceptions.** — Whenever there is a period of excessive unemployment in this state, every person who is charged with the duty, either by law or contract, of constructing or building any public works project or improvement for the state or any political subdivision, municipal corporation or other governmental unit thereof shall employ only Missouri laborers and laborers from nonrestrictive states on such project or improvement, and every contract let by any such person shall contain a provision requiring that such labor be used, except that other laborers may be used when Missouri laborers or laborers from nonrestrictive states are not available, or are incapable of performing the particular type of work involved, if so certified by the contractor and approved by the contracting officer.

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(L. 1993 H.B. 416 & 417 § 3)

8/28/1993

**290.565. Law not to apply to certain personnel.** — The provisions of sections [290.550](#) to [290.580](#) shall not apply to regularly employed nonresident executive, supervisory or technical personnel.

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(L. 1993 H.B. 416 & 417 § 4)

8/28/1993

**290.570. Federal projects, statutes not enforced, when.** — In all contracts involving the expenditure of federal aid funds, sections [290.550](#) to [290.580](#) shall not be enforced in such manner as to conflict with any federal statutes or rules and regulations.

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(L. 1993 H.B. 416 & 417 § 5)

8/28/1993

**290.575. Penalties for failure to use certain laborers, when.** — Any person who knowingly fails to use Missouri laborers or laborers from nonrestrictive states as required in section [290.560](#) shall be guilty of an infraction. Each separate case of failure to use Missouri laborers or laborers from nonrestrictive states on such public works projects or improvements shall constitute a separate offense.

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(L. 1993 H.B. 416 & 417 § 6)

8/28/1993

**290.580. Department to enforce law — injunctive relief, when.** — Sections [290.550](#) to [290.580](#) shall be enforced by the department of labor and industrial relations, which, as represented by the attorney general, is empowered to sue for injunctive relief

against the awarding of any contract or the continuation of any work under any contract for public works or improvements at a time when the provisions of sections 290.550 to 290.580 are not being met.

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(L. 1993 H.B. 416 & 417 § 7)

8/28/1993

**\*290.590. Labor organization membership, dues, and fees not required as condition of employment — definitions — violations, penalty — investigation of complaints — inapplicability, when. — 1.** As used in this section, the following terms shall mean:

(1) "**Employer**", any individual, organization, partnership, state agency, political subdivision, corporation, or other legal entity which employs or has employed one or more individuals performing services for the entity within this state; and

(2) "**Labor organization**", any organization of any kind or agency, or employee representation committee or union which exists for the purpose in whole or in part of dealing with employers concerning wages, rates of pay, hours of work, other conditions of employment, or other forms of compensation.

2. No person shall be required as a condition or continuation of employment to:

(1) Become, remain, or refrain from becoming a member of a labor organization;

(2) Pay any dues, fees, assessments, or other similar charges however denominated of any kind or amount to a labor organization; or

(3) In lieu of the payments listed under subdivision (2) of this subsection, pay to any charity or other third party any amount equivalent to, or on a pro rata basis, any dues, fees, assessments, or other charges required of members of a labor organization.

3. Any agreement, understanding, or practice, written or oral, implied or expressed, between any labor organization and employer that violates the rights of employees as guaranteed under this section is unlawful, null and void, and of no legal effect.

4. Any person who violates or directs another to violate any provision of this section shall be guilty of a class C misdemeanor.

5. (1) Any person injured as a result of any violation or threatened violation of this section shall be entitled to injunctive relief against any and all violators or persons threatening violations.

(2) Any person injured as a result of any violation or threatened violation of this section may recover any and all damages of any character resulting from such

violation or threatened violation including costs and reasonable attorney fees. Such remedies shall be independent of and in addition to the other penalties and remedies prescribed under this section.

6. The prosecuting attorney or circuit attorney with jurisdiction over the location where a violation or threatened violation of this section occurs or the attorney general of this state shall investigate complaints of violation or threatened violation of this section, prosecute any person violating this section, and use all means at their command to ensure the effective enforcement of this section.

7. This section shall not apply:

- (1) To employers and employees covered by the federal Railway Labor Act;
- (2) To federal employers and employees;
- (3) To employers and employees on exclusive federal enclaves;
- (4) Where this section conflicts with or is preempted by federal law; or
- (5) To any agreement between an employer and a labor organization entered into before August 28, 2017, but shall apply to any such agreement upon its renewal, extension, amendment, or modification in any respect after August 28, 2017.

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(L. 2017 S.B. 19, Rejected by Referendum, Proposition A, August 7, 2018)

\*Revisor's Note: On February 21, 2017, a petition for referendum (Chapter 116, RSMo) on Senate Substitute No. 2 for Senate Bill No. 19 was received by the Secretary of State's Office. On March 28, 2017, the official ballot title was certified by the Secretary of State (Section 116.180, RSMo) and approved for circulation in accordance with Article III, Section 52(a). On August 18, 2017, the Secretary of State's Office received 163 boxes of referendum petitions for Senate Substitute No. 2 for Senate Bill No. 19. On November 22, 2017, the Secretary of State issued a certificate of sufficiency certifying the referendum petition. The referendum petition was to be placed on the November 6, 2018, ballot unless a different date was designated by the General Assembly. The General Assembly, in SCR 49 enacted on May 24, 2018, designated the referendum vote to be held on August 7, 2018. The measure was rejected by referendum, Proposition A, on August 7, 2018.

8/28/2017

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In accordance with Section **3.090**, the language of statutory sections enacted during a legislative session are updated and available on this website **on the effective date** of such enacted statutory section.



- ▶ **Other Links**
- ▶ **Other Information**



**Missouri Senate**



**MO.gov**



**Missouri House**

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Site errors / suggestions - [webmaster@LR.mo.gov](mailto:webmaster@LR.mo.gov)



**Our flag's story**





**DIVISION OF  
LABOR  
STANDARDS**

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
**AFFIDAVIT  
COMPLIANCE WITH THE PREVAILING WAGE LAW**

I, \_\_\_\_\_, upon being duly sworn upon my oath state that: (1) I am the  
*(Name)*  
\_\_\_\_\_ of \_\_\_\_\_; (2) all requirements of  
*(Title)* *(Name of Company)*  
§§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects  
have been fully satisfied with regard to this company's work on \_\_\_\_\_;  
*(Name of Project)*

(3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this company's work on this project; and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. \_\_\_\_\_ Section \_\_\_\_\_ issued by the Missouri Division of Labor Standards and applicable to this project located in \_\_\_\_\_ County, Missouri, and completed on the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

\_\_\_\_\_  
Signature

Subscribed and sworn to me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.  
My commission expires \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
Receipt by Authorized Public Representative



MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
**PREVAILING WAGE  
 PROJECT NOTIFICATION –  
 CONTRACTOR INFORMATION**

New  Update

The information below is requested pursuant to Sections 290.210 through 290.340, RSMo.

1. Date of Notification		2. Annual Wage Order Number Included in Bid Specifications	
3. Popular or Descriptive Name of Project			
4. Estimated Project Cost of Completion (total construction contracts to be awarded)		\$	
5. Exact Location of Project		County	City
6. Official Name of Public Body or Agency			
7. Name of Contact Person		8. Phone Number (include area code)	
9. Address			
10. Email Address		Website	
11. Contract Award Date	12. Estimated Date of Project Completion	13. Will There Be Any Federal Funds Used in this Contract?	
		<input type="checkbox"/> Yes <input type="checkbox"/> No	

**14. Contractor Information Notification**

General Contractor:

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_  
 Phone Number \_\_\_\_\_ Email Address \_\_\_\_\_  
 Type of Craftsmen Needed by Project \_\_\_\_\_  
 Scope of Work \_\_\_\_\_

List all Subcontractors:

1. Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_  
 Phone Number \_\_\_\_\_ Email Address \_\_\_\_\_  
 Type of Craftsmen Needed by Project \_\_\_\_\_  
 Scope of Work \_\_\_\_\_

2. Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_  
 Phone Number \_\_\_\_\_ Email Address \_\_\_\_\_  
 Type of Craftsmen Needed by Project \_\_\_\_\_  
 Scope of Work \_\_\_\_\_

3. Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_  
 Phone Number \_\_\_\_\_ Email Address \_\_\_\_\_  
 Type of Craftsmen Needed by Project \_\_\_\_\_  
 Scope of Work \_\_\_\_\_

(Subcontractors continued)

4. Name			
Address			
City	State	ZIP	
Phone Number	Email Address		
Type of Craftsmen Needed by Project			
Scope of Work			
5. Name			
Address			
City	State	ZIP	
Phone Number	Email Address		
Type of Craftsmen Needed by Project			
Scope of Work			
6. Name			
Address			
City	State	ZIP	
Phone Number	Email Address		
Type of Craftsmen Needed by Project			
Scope of Work			
7. Name			
Address			
City	State	ZIP	
Phone Number	Email Address		
Type of Craftsmen Needed by Project			
Scope of Work			
8. Name			
Address			
City	State	ZIP	
Phone Number	Email Address		
Type of Craftsmen Needed by Project			
Scope of Work			
9. Name			
Address			
City	State	ZIP	
Phone Number	Email Address		
Type of Craftsmen Needed by Project			
Scope of Work			

The state of Missouri requires workers on public works projects be paid the prevailing wage. Public bodies have duties as required under Section 290.210 - 290.340, RSMo.

Mail, Fax, or Email completed form to: DIVISION OF LABOR STANDARDS  
Attn: Prevailing Wage Section  
P.O. Box 449, Jefferson City, MO 65102-0449  
Phone: 573-751-3403 Fax: 573-751-3721  
Email: [prevailingwage@labor.mo.gov](mailto:prevailingwage@labor.mo.gov)  
Website: [www.labor.mo.gov/DLS](http://www.labor.mo.gov/DLS)

**SUBMIT**

Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.  
TDD/TTY: 800-735-2966 Relay Missouri: 711



**ADDENDUM NUMBER** \_\_\_\_\_

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

*[NOTE: Add Month/Date/Year for which this Addendum is officially posted by City. Be certain to remove this note before final document is printed.]*

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

*[NOTE: Addenda are used to clarify, revise, add to, or delete information in the original bidding documents or in previous addenda prior to opening of bids. Items should be organized in the same order as the original bidding documents Table of Contents. Cite the specific bidding document and the specific location within it where each change is to be made followed by the detailed change. If entire pages or documents are replaced or added as accompanying attachments, state the title of the document and the specific page number(s) removed and/or added. (e.g., Delete Section 01011 - Summary pages 1-6 and add the attached Section 01011 - Summary pages 1-10.). Be certain to remove this note before final document is printed.]*

*[NOTE: Add Month/Date/Year. Be certain to remove this note before final document is printed.]*

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on \_\_\_\_\_, are amended as follows:

*[NOTE: If the bid date is being changed add Month/Day/Year; if not, delete this sentence. Be certain to remove this note before final document is printed.]*

The Bid date for this Project stated in Document 00130 - Invitation to Bid shall be changed to: 2:00 PM, on \_\_\_\_\_.

Information to Bidders The following is provided to Bidders for information only:

*[NOTE: Include items under this heading such as Pre-bid meeting attendance list, soils report, etc.; items that should **not** be contractual, but are useful information to Bidders. Delete this heading and introduction if not applicable for this Addendum. Be certain to remove this note before final document is printed.]*

- 1.
- 2.

*[NOTE: Include Bidder/Proposer questions and answers to those questions. If questions are resolved by a contractual change, reference the contract section and make the appropriate change in one of the sections below. Delete this heading and table if not applicable for this Addendum. Be certain to remove this note before final document is printed.]*

Q1.	
A1.	
Q2.	
A2.	
Q3.	

<b>A3.</b>	

*[NOTE: Under the following sections, include changes to those documents under the heading with this same title found in Document 00010 - Table of Contents, (including changes to previous addenda). Format for revisions provided below. Delete sections if not applicable to this addendum. Be certain to remove this note before final document is printed.]*

Bidding Requirements

1. Add the following section(s):
  - a. Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_
  - b. Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_

*[OR]*

2. Delete the following section(s):
  - a. Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_
  - b. Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_

*[OR]*

3. Delete and replace the following section(s):
  - a. Delete Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_ and replace with the following Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_:
  - b. Delete Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_ and replace with the following Document, Sec. \_\_, Subparagraph \_\_, Page \_\_\_\_:

Contracting Requirements

- 1.
- 2.

Specifications

- 1.
- 2.

Drawings:

- 1.
- 2.

**NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the Bid Form - Document 00410.**



# REQUEST FOR INTERPRETATION

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

Contractor \_\_\_\_\_

RFI Number \_\_\_\_\_ Date \_\_\_\_\_

From: \_\_\_\_\_

To: \_\_\_\_\_

Re: \_\_\_\_\_

Spec. Sec. Ref:	Paragraph:	Drawing Ref:	Detail:
-----------------	------------	--------------	---------

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

Response: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Attachments

Response From: \_\_\_\_\_ To: \_\_\_\_\_ Date Transmitted: \_\_\_\_\_ Date Rec'd: \_\_\_\_\_

Signed: \_\_\_\_\_  
Design Professional

Signed: \_\_\_\_\_  
Owner's Representative

- Distribution:
- Owner
  - Contractor
  - Construction Manager
  - Design Professional
  - Consultant \_\_\_\_\_
  - Other \_\_\_\_\_





## SUPPLEMENTAL DESIGN INSTRUCTION

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

To Contractor \_\_\_\_\_

From: \_\_\_\_\_ SDI No \_\_\_\_\_ Issue Date: \_\_\_\_\_

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Price or Contract Times. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Price or Contract Times.

Description:

Attachments (*List*)

\_\_\_\_\_  
(Signature) Design Professional

\_\_\_\_\_  
Date

- Distribution:
- Owner
  - Contractor
  - Construction Manager
  - Design Professional
  - Consultant \_\_\_\_\_
  - Other \_\_\_\_\_



# REQUEST FOR PROPOSAL

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

To Contractor \_\_\_\_\_

From: \_\_\_\_\_ RFP No \_\_\_\_\_ Issue Date: \_\_\_\_\_

Please submit an itemized proposal for changes in the Contract Price and Contract Times for proposed modifications to the Contract Documents described herein. Submit proposal within \_\_\_\_\_ days, or notify the Owner in writing of the date on which you anticipate submitting your proposal.

This is NOT a Change Order, a Work Change Directive or a direction to proceed with the work described in the proposed modifications.

Description:

Attachments

---

Prepared by Design Professional

---

Prepared by Construction Manager

---

REQUESTED by OWNER'S Representative

---

- Distribution:
- Owner
  - Contractor
  - Construction Manager
  - Design Professional
  - Consultant \_\_\_\_\_
  - Other \_\_\_\_\_





# CHANGE ORDER

**Project/Contract Number:** 80001977/9618

**Project Title:** Prospect Elevated Water Storage Tank

Change Order No: \_\_\_\_\_ Date of Issuance: \_\_\_\_\_

Ordinance No: \_\_\_\_\_ Ordinance Effective Date: \_\_\_\_\_

Contract Notice To Proceed Date: \_\_\_\_\_

To CONTRACTOR:

The Contract is changed as follows:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

This Change Order constitutes compensation in full on behalf of the Contractor and its subcontractors and suppliers for all costs, including impact costs and extended general conditions, and markups directly and indirectly attributable to the Work changes ordered herein, for all delays related thereto and for performance of the changes within the time stated. Contractor hereby releases all claims for delay, interruption, extended general conditions, impact and cumulative impact claims for this Work.

[Note: Identify the specific attachments; example: "Attachment A, Additional Scope of Services." Delete all notes before printing final]

See Attached Document(s).

[Note: If the CO does not change the Contract Price, use "Director" instead of "Director of Finance"]

**Not valid until signed by the Director of Finance.**

The original Contract Price was	_____	\$0.00
Net change by previously authorized Change Orders	_____	\$0.00
The Contract Price prior to this Change Order was	_____	\$0.00
The Contract Price will be ( <input type="checkbox"/> increased by) ( <input type="checkbox"/> decreased by) ( <input type="checkbox"/> unchanged)	_____	\$0.00
The new Contract Price including this Change Order will be	_____	\$0.00

[Note: If revised, establish and enter new dates. If unchanged, enter current contract dates.

If you are only changing the Final Completion date, add the following reference:

"The Contract Time for Final Completion will be . . ."]

The Contract Time will be ( <input type="checkbox"/> increased by) ( <input type="checkbox"/> decreased by) ( <input type="checkbox"/> unchanged)	_____	( ) calendar days
The date of Substantial Completion as of the date of this Change Order therefore is	_____	Enter Date
The date of Final Completion as of the date of this Change Order therefore is	_____	Enter Date

Project No. & Title  
 Change Order No.

[Note: Include any required additional signatures.]

<b>DESIGN PROFESSIONAL:</b>	By:  Title:	Date:
<b>CONTRACTOR:</b>	By:  Title:	Date:
<b>CITY:</b>	By:  Title:	Date:

Approved as to form: \_\_\_\_\_  
 Assistant City Attorney

[Note: If this CO does not change the Contract Price, delete the cert. of funds by Finance Director but send signed copy to Finance.]

I certify there is a balance otherwise unencumbered to the credit of the appropriation to which the above amount is chargeable, and a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made, each sufficient to meet the above obligation.

\_\_\_\_\_  
 Director of Finance By: \_\_\_\_\_ Date

- Distribution:  CITY  
 CONTRACTOR  
 DESIGN PROFESSIONAL

**REMINDER:** CONTRACTOR is responsible for considering the effect this Change Order may have on its ability to meet or exceed the D/M/WBE participation amounts in its Contractor Utilization Plan (CUP) as amended by any previously approved Request for Modification/Substitution. If CONTRACTOR will not be able to achieve the approved participation amounts in performing the work included within this Change Order, or if CONTRACTOR needs to retain the services of additional D/M/WBEs not previously listed in its CUP, CONTRACTOR is advised to submit a Request for Modification/Substitution.



# WORK CHANGE DIRECTIVE

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

No.: \_\_\_\_\_ Date of Issuance: \_\_\_\_\_

TO:  
(CONTRACTOR)

You are directed to proceed promptly with the following work:

Description:

Purpose of Work Change Directive:

Attachments: *(List documents supporting change)*

If the above work results on a change in the Contract Price or Contract Times, any request for a Change Order based thereon will involve one or more of the following methods of determining the effect of the change(s).

Method of determining change in  
Contract Price:

Method of determining change in  
Contract Times:

- Unit Prices
- Lump Sum
- As Stipulated in General Conditions
- Other \_\_\_\_\_

- CONTRACTOR's Records
- DESIGN PROFESSIONAL's Records
- City's Records
- Other \_\_\_\_\_

Estimated increase (decrease) in Contract Price:  
\$ \_\_\_\_\_

Estimated increase (decrease) in Contract Times:  
Substantial Completion: \_\_\_\_\_ days;

If the change involves an increase, the estimated Amount is not to be exceeded without further authorization.

Final Completion: \_\_\_\_\_ days.  
If the change involves an increase, the estimated times are not to be exceeded without further authorization.

Recommended:

Recommended:

Recommended:

DESIGN PROFESSIONAL

Construction Manager

City

By (Authorized Signature)

By (Authorized Signature)

By (Authorized Signature)

Distribution:

- City
- Contractor
- Construction Manager

- Design Professional
- Consultant
- Other

# WORK CHANGE DIRECTIVE (“WCD”) INSTRUCTIONS

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**[Note: Do not attach these instructions to the WCD Form]**

## **A. GENERAL INFORMATION**

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order. If the WCD may result in an increase in the Contract Price, a contract impact cost analysis must be performed prior to issuing the WCD. Availability of funds and authorization to expend funds must be part of the analysis.

For supplemental instructions and minor changes not involving a possible change in the Contract Price or the Contract Times a Supplemental Design Instruction may be used.

## **B. COMPLETING THE WORK CHANGE DIRECTIVE FORM**

Based on conversations between Design Professional, City’s Representative and CONTRACTOR, Design Professional must complete the following:

**DESCRIPTION:** shall include a summary of the Work included in the WCD. Additional information may be attached to the WCD to further define the scope.

**PURPOSE OF WORK CHANGE DIRECTIVE:** will identify clearly if the Work included in the WCD is an addition, deletion, revision, or some combination.

**ATTACHMENTS:** shall identify all attachments included in and made a part of the WCD. Be certain that attachments are clearly labeled.

**METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE:** Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another WCD must be issued to change the estimated price. Do not leave blank spaces or write “To be determined” (or “TBD”). An estimated dollar figure must be assigned to the Work. If the WCD is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked “No Change in Price”.

**METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIMES:** Mark the method to be used in determining the change in Contract Times and the estimated increase or decrease in Contract Times. If the change involves an increase in the Contract Times and the estimated times are approached before the additional or changed Work is completed, another WCD must be issued to change the times or CONTRACTOR may stop the changed Work when the estimated times are reached. Do not leave blank spaces or write “To be determined” (or “TBD”). If the WCD is not likely to change the Contract Times, the space for estimated increase (decrease) should be marked “No Change in Times”.

Once Design Professional has completed and signed the form, all copies should be sent to CITY for authorization because Design Professional does not have authority to authorize changes in Price or Times. Once authorized by CITY, a copy must be sent by Design Professional to CONTRACTOR. Price and Times may only be changed by Change Order signed by CITY, Design Professional, and CONTRACTOR. If the value of the work included in the WCD exceeds the contingency or budget available for the contract, staff must obtain written approval from the Director or his or her designee before the WCD is issued. A Director or his or her designee may not approve a WCD that will exceed City Council authorization. If the work included in the WCD is needed as a result of an emergency, staff may proceed with the issuance of the WCD without

prior written approval even if the value of the work added is expected to exceed the contract contingency balance.

Once the Work covered by this directive is completed or final cost and times are determined. CONTRACTOR must submit proper documentation for inclusion in a Change Order.

**IF THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIMES A CHANGE ORDER, IF ANY, MUST BE PROCESSED PROMPTLY.**

## SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This section covers the modification of specifications for this Project. Any specification that is modified for this Project is listed in Part 3 of this Section by Division. If the Division or specification is not included in this Section, then the Project specification in the Division remains intact.
- B. Related Work Specified Elsewhere:
  - 1. Section 00700 – General Conditions
  - 2. Section 00800 – Supplementary Conditions
  - 3. Section 01320 – Construction Progress Documentation
  - 4. Section 01322 – Photographic Documentation
  - 5. Section 01340 – Submittals
  - 6. Section 01520 – Temporary Facilities
  - 7. Section 01560 – Environmental Protection and Special Controls
  - 8. Section 01570 – Temporary Erosion and Sediment Control
  - 9. Section 01580 – Project Signs
  - 10. Certifications and other commitments and agreements for continuing services to Owner as specified throughout the Contract Documents.
  - 11. KC Water Standards and Specifications For Water Main Extensions and Relocations

#### 1.02 SPECIFICATION MODIFICATIONS

- A. In the event Section 01015 conflicts with other project specifications of Divisions 1 through 40; the requirements of this Section shall govern.

#### 1.03 QUALITY ASSURANCE

- A. The Contractor is responsible for the quality assurance and quality control of the Work.

#### 1.04 INFORMATION PROVIDED BY THE CITY

- A. As specified in the Contract Documents.

#### 1.05 DESCRIPTION OF PROJECT

- A. The work to be perform under these Contract Documents shall be consistent with Section 00700 in the construction, installation, and completion of all work required in connection with the ***Prospect Elevated Water Storage Tank*** in Kansas City, Jackson County, Missouri.
- B. The work to be performed under these Construction Contract Documents is generally described as follows:  
***The project consists of designing and installing a 3.0 million-gallon elevated water storage tank and accessories as defined in Section 33 16 11 and installing process piping, yard piping, and valves, and completing all associated work as defined in the Contract Documents for a complete and fully operational project located in Jackson County, Kansas City, Missouri south of 129<sup>th</sup> Street and Robinson Pike Road on the suction side of the Prospect Pump Station in the South Booster service level. The yard piping will connect the water storage tank to a proposed 16-inch transmission main and an existing 24-inch PCCP transmission main, both identified in the Contracts Drawings. The proposed 16-inch transmission main is part of a separate project named Prospect Road Elevated Water Storage Tank Transmission Main. The yard piping includes pipe sizes 30-inch, 24-inch, and 16-inch diameters.***

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

1.06 CONTRACT DRAWINGS

- A. The Drawings on which the Form 00412 Adjustment Unit Prices and Contract are to be based are entitled *Prospect Elevated Water Storage Tank*. The Drawings are to be supplemented by additional shop and dimension drawings of materials and equipment and other drawings where specified. materials furnished by the city
- B. The City will provide the following equipment or materials to be used for the Project. All materials required to complete the Work in accordance with the Contract Documents shall be furnished, installed, and paid for by the Contractor.
  - 1. No equipment or materials will be provided by the City.

1.07 SEQUENCE OF WORK

- A. Contractor shall proceed with the work in a sequence determined by the Contractor, except as generally follows:
  - 1. Where excavation is required, call 1-800-DIGRITE or 811 to confirm location of underground utilities in accordance with Missouri One Call System requirements prior to construction as indicated.
  - 2. Complete preconstruction photographs within one week of the notice-to-proceed for the project, assuming weather conditions are such to allow adequate completion of the photographs, see Section 01322.
  - 3. Complete site locate of the tie-in point to the 24-inch PCCP transmission main within three weeks of the notice-to-proceed of the project to determine PCCP pipeline joint locations and joint type as well as elevation of the PCCP pipeline. Within two weeks after site locate is complete Contractor shall submit any required changes to the tie-in design required for successful project completion as a project RFI and piping submittals shall reflect any changes required.
  - 4. Scheduling of the work that requires shutdown of transmission mains must be approved by KC Water Project Manager prior to work. The Contractor shall include in the request the date, time, and amount of time required to shut down the service. Contractor shall assist with filling out and distributing shutdown notices under the direct supervision of the City. The Contractor shall give Owner at least one week's notice so a temporary test

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 DIVISION 1 – GENERAL REQUIREMENTS, SPECIFICATION MODIFICATIONS

- A. Conforming to Construction Drawings:
  - 1. The Contractor shall be responsible for developing Conforming to Construction Record Drawings in accordance to KC Water Standards and Specifications for Water main Extensions and Relocations.
- B. Section 01340 – Submittals:
  - 1. Schedule of Values.
    - a. As provided in the General Conditions, and after review of the preliminary progress schedule at the preconstruction conference and before submission of the first Application for Payment, Contractor shall prepare and submit to City for review a Schedule of Values for the construction phases of the project. The Schedule of Values, showing the estimated quantity and value of each kind of work must be approved by City before any Application for Payment is prepared.

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

- b. The Schedule of Values for the construction phase portion of the project shall include at least the following items:

ITEM	DESCRIPTION	UNIT	UNIT COST	TOTAL COST
1.	Mobilization	LS		
2.	30" DIP Class 54 Waterline w/Excavation & Backfill	Lin Ft		
3.	24" DIP Class 54 Waterline w/Excavation & Backfill	Lin Ft		
4.	16" DIP Class 54 Waterline w/Excavation & Backfill	Lin Ft		
5.	Valve Room – Drainage Pipe	Lin Ft		
6.	Bends w/ Restrained Joints – Specify size and degree	Each		
7.	Sleeves and Reducers – Specify size	Each		
8.	Tees w/ Backing Block – Specify size	Each		
9.	Straddle Blocks – Specify size of Main	Each		
10.	Valve Room – Drainage Pipe	Lin Ft		
11.	Sewer Crossing	Each		
12.	2" Gas Lateral Relocation	LS		
13.	Fire Hydrant	Each		
14.	Riprap	Sq Yd		
15.	Asphalt Removal & Replacement	Sq Ft		
16.	Asphalt	Sq Ft		
17.	Sidewalk	Sq Ft		
18.	Concrete Driveway	Sq Ft		
19.	Drilled Pier Foundation System	LS		
20.	Concrete Pedestal Support Structure	LS		
21.	3 Million-Gallon Composite Elevated Water Storage Tank	LS		
22.	30" 304L SST Inlet Riser Pipe	LS		
23.	30" 304L SST Outlet Riser Pipe	LS		

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

ITEM	DESCRIPTION	UNIT	UNIT COST	TOTAL COST
24.	24" 304L SST Overflow Pipe	LS		
25.	Process Piping – Valve Room	LS		
26.	Elevated Water Storage Tank Protective Coatings	LS		
27.	Elevated Water Storage Tank Protective Logo – Single KC Droplet	LS		
28.	Seeding	LS		
29.	Gas Line Relocation	LS		
30.	Traffic Control	LS		
31.	Photographs	LS		
32.	SWPPP & Erosion Control	LS		
33.	Testing	LS		
34.	Disinfection	LS		
35.	Demobilization	LS		
36.	Permits	LS		
37.	Cleanup	LS		
38.	Allowance	LS		
39.	Conforming to Construction Record Drawings & Project Record Documents	LS		

2. In accordance with paragraph TEMPORARY ENVIRONMENTAL PROTECTION, the following restrictions shall apply to Work regarding wetlands:
  - a. Not Applicable.
3. In accordance with paragraph TEMPORARY ENVIRONMENTAL PROTECTION, the following restrictions shall apply to Work regarding floodplains:
  - a. Not Applicable.
4. In accordance with paragraph APPLICABLE CODES, the following Public Works Department standard specifications are incorporated into this set of Contract Documents by reference:
  - a. American Public Works Association – Kansas City Metropolitan Chapter (APWA):
    - (1) APWA Division II Section 2200 – Paving (APWA-KCMO 2200).
    - (2) APWA Division II Section 2300 – Incidental Construction (APWA-KCMO 2300).

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

- (3) APWA Division II Section 2500 – Sanitary Sewer Piping Requirements (APWA-KCMO 2500).
    - (4) APWA Division V Section 5100 - Erosion and Sediment Control (APWA-KCMO 5100).
  5. In accordance with paragraph APPLICABLE CODES, the following Public Works Department standard details are incorporated into this set of Contract Documents by reference:
    - a. KC Water Standards and Specifications for Water Main Extensions and Relocations (May 2018):
      - (1) Sewer Crossing – Detail Number 01016-1 and 01016-3.
      - (2) Pipe Embedment and Backfill – Detail Number 02200-1.
      - (3) Butterfly Valve – Detail Number 02641-3.
      - (4) Thrust Blocks Detail Number – 02699-1 and 02669-2.
      - (5) Straight Set Hydrant Installation – Detail Number 02645-2.
- C. Preconstruction Conference.
  1. Submittals Required for the Preconstruction Conference in accordance with Section 01340.
- D. The following is a list documents that are to be submitted in electronic and hard copy formats:
  1. Preliminary Project Schedule, submit one (1) copy.
  2. Project Baseline Schedule, submit one (1) copy.
  3. Progress Schedules, submit one (1) copy.
  4. Project Recovery Schedules (as applicable), submit one (1) copy.
  5. Documents that are to be submitted in hard copy format are to be delivered to the following:

Water Services Department  
4800 East 63rd Trafficway  
Kansas City MO 64130-4626  
United States of America  
Attn: John Reddy  
Project Manager
- E. Section 01320 Construction Progress Documentation:
  1. In accordance with Section 01320, paragraph 1.06, Contractor shall provide a Schedule Level that meets the minimum requirements of a Level 3 - Detail Schedule.
  2. In accordance with Section 01320, paragraph 1.11, a Cost Correlation is a requirement of the Project.
  3. The Contractor shall prepare all schedules using Primavera version P6 or higher.
- F. Section 01322 Photographic Documentation:
  1. Electronic photographs and video navigation system for searching and viewing recorded imagery will be required as part of the Project.
  2. Preconstruction photographs and videos will be required as part of the Project.
  3. Preconstruction photographs and videos must be taken after Notice-to-Proceed.
  4. Preconstruction photographs and videos must be taken after utilities are marked.
  5. Preconstruction photographs and videos must include all haul routes.
  6. No construction can start until the photographs and videos are reviewed and approved.
  7. Construction Progress Photographs will be required as part of the Project.
  8. Construction Activity Photographs will be required as part of the Project.
  9. Postconstruction Photographs and Postconstruction Videos will be required as part of the Project.

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

10. All photographs and video provided by the Contractor will be submitted using the Document Control System in accordance with Section 01322 and Section 01340.
- G. Section 01520 Temporary Facilities:
  1. Office: The Contractor is required to maintain a suitable stationary office at or near the site. In accordance with paragraph 3.01 OFFICE, the Contractor will be allowed to use an assigned vehicle in lieu of a stationary office.
  2. Field Office for Resident Project Representatives: In accordance with Paragraph 3.02 of this Section, the Contractor shall provide a field office for the Resident Project Representative.
  3. Field Office for Resident Project Representative: In accordance with paragraph 3.02 of this Section, provide a separate field office for City's Resident Project Representative on the Site with the following minimum requirements:
    - a. 150-square-foot minimum, with minimum dimension of 8 feet.
    - b. Secure entrance doors - one set of keys.
    - c. Windows with blinds and operable sash and insect screens.
    - d. Lockable storage closet.
    - e. Resilient floor covering.
    - f. Furnishings:
      - (1) One standard size desk with three drawers, swivel desk chair with arms.
      - (2) One four foot by eight foot (4'x 8') conference table.
      - (3) One plan rack to hold a minimum of six (6) racks of Drawings.
      - (4) One standard four-drawer legal-size metal filing cabinet with lock and key.
      - (5) Six linear feet of bookshelves, 10-inch minimum depth.
      - (6) Minimum of six office chairs.
      - (7) One waste basket per desk and table.
      - (8) One tack board, 36" x 30"
    - g. Services:
      - (1) Lighting: 50 foot-candles (538 lux) at desktop height. Exterior lighting at entrance door.
      - (2) Heating and air conditioning.
      - (3) Electrical Service: Minimum of two circuits, 110V, 60 hertz. Minimum of four 110V duplex convenience outlets.
      - (4) Outdoor toilet facilities with toiletries.
      - (5) Weekly cleaning service for trailer/office and toilet facilities.
      - (6) Electric water cooler.
      - (7) 30 Mbps internet service.
- H. Section 01570 Temporary Erosion and Sediment Control:
  1. A Conceptual Erosion Control Plan is included in Drawings. Because the Contractor is responsible for compliance with the SWPPP, the Contractor shall be responsible for reviewing and revising the plan as needed to assure permit compliance for all phases of the Work. The Contractor's Bid shall include all labor, materials, and equipment needed to provide erosion and sedimentation control during all construction phases.
- I. Section 01580 Project Signs:
  1. Printers: The following is a list of local businesses who have provided printing services for City project signs. Printing location shall be coordinated with the City/Design Professional.
    - a. Almar Printing  
7735 Wornall Road

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

Kansas City, MO 64114  
Phone: (816) 523-4566

- b. Custom Color  
14320 W. 101st Terrace  
Lenexa, KS 66215  
Phone: (913) 730-3100
- c. KC Blueprint Company  
1804 Swift St.  
North Kansas City, Missouri 64116  
816-513-1048 Print Center  
816-527-0900 Home Office
- d. Office Max
- e. City Hall Basement Print Center  
414 E. 12th Street  
Kansas City, MO 64106  
Phone: (816) 513-1048

- 2. Number of Project Signs to be provided:
  - a. Contractor shall provide one (1) Project sign.

J. Public Communication:

- 1. The City is responsible for the Initial Notification for Construction.
- 2. The City will provide templates for all letters, mailers, door hangers, and any other correspondences with the public.
- 3. The Contractor shall provide a three (3) week notification to all properties affected by any planned temporary utility shut-off.
  - a. The Contractor shall provide one (1) letter as the means of notification to each property owner at the Contractor's expense.
- 4. In the event of an emergency shut-off for any utilities, the Contractor shall immediately contact the City, Engineer, and Utility Owner.

K. Traffic Control

- 1. Contractor shall be solely responsible for maintenance of traffic throughout the project area. Contractor shall maintain one lane of traffic in each direction at all times, except as approved otherwise by the City of Kansas City, Missouri Water Services Department. Contractor shall maintain access to all properties within the project area. If it is not possible to maintain access to a property due to necessary construction activities, Contractor must work with Property Owner to determine an acceptable duration and time for access to be limited, and Contractor shall work to open access as soon as possible. Contractor shall provide agreed upon durations and times in writing to on-site Water Services project representative prior to limiting property access.
- 2. Access Requirements:
  - a. Contractor shall provide flaggers as needed and requested by the City or Engineer.
  - b. Contractor shall maintain a minimum of one (1) lane of traffic each direction at all times on Robinson Pike Road.

SECTION 01015 – SPECIFIC PROJECT REQUIREMENTS: continued

END OF SECTION 01015



# ALLOWANCE AUTHORIZATION

Project Number \_\_\_\_\_ 80001977

Project Title \_\_\_\_\_ Prospect Elevated Water Storage Tank

To: \_\_\_\_\_

Authorization Number: \_\_\_\_\_

Re: \_\_\_\_\_

From: \_\_\_\_\_

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

Contract For: \_\_\_\_\_

You are authorized to perform the following item(s) of work and to adjust the Allowance Sum accordingly:

This is NOT a CHANGE ORDER and does NOT INCREASE OR DECREASE the CONTRACT AMOUNT.

Original Allowance	\$ _____
Allowance Expenditures prior to this Authorization	\$ _____
Allowance Balance prior to this Authorization	\$ _____
Allowance will be <input type="checkbox"/> increased <input type="checkbox"/> decreased by this Authorization	\$ _____
New Allowance Balance	\$ _____

APPROVAL RECOMMENDED

CITY APPROVAL

\_\_\_\_\_  
Design Professional                      Date

\_\_\_\_\_  
City's Representative                      Date

CONTRACTOR ACCEPTANCE

\_\_\_\_\_  
Construction Manager                      Date

\_\_\_\_\_  
Contractor                      Date

Attachments:

- Distribution:
- City
  - Contractor
  - Construction Manager
  - Design Professional
  - Consultant
  - Other



# APPLICATION FOR PAYMENT

**Project/Contract Number:** 80001977/9618

**Project Title:** Prospect Elevated Water Storage Tanks

Final Payment<sup>5</sup>

CONTRACTOR \_\_\_\_\_

Address \_\_\_\_\_

Application Number<sup>2</sup>: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Ordinance/Resolution Number: \_\_\_\_\_  
 Effective: \_\_\_\_\_  
 PO Number: \_\_\_\_\_  
 Vendor Number: \_\_\_\_\_

Application for Work Accomplished from \_\_\_\_\_ to \_\_\_\_\_

Original Contract Price	[1]		\$	-
Net by Change Orders through		[2]	\$	-
Current Contract Price (1+2)		[3]	\$	-
Completed Work	[4]	\$	-	
Disputed Amounts <sup>3</sup>	[-]	[4a]	\$	-
Stored Material <sup>4</sup>	[5]	\$	-	
Disputed Amounts <sup>3</sup>	[-]	[5a]	\$	-
Total Completed and Stored to Date (4+5)		[6]	\$	-
Previous Payments	[7]	\$	-	
Previous Retainage	[8]	\$	-	
Total Previous Applications (7+8)		[9]	\$	-
Amount This Application (6-9)		[10]	\$	-
Less Retainage This Application (5%)		[-]	[11]	\$ -
Release of Retainage		[12]	\$	-
Total Due This Application (10-11+12)		[13]	\$	-
<b>Liquidated Damages</b>				
Completion of Work	[14]	\$	-	[-] \$ -
Prevailing Wage <sup>7</sup>	[15]	\$	-	[-] \$ -
MBE/WBE Program <sup>7</sup>	[16]	\$	-	[-] \$ -
Workforce Program <sup>7</sup>	[17]	\$	-	[-] \$ -
<b>Total Amount Due Contractor (13 - 14 through 17)</b>		[18]	\$	-

Accompanying Documentation: <sup>1, 2, 3, 4, 5, & 6</sup> and any other information as necessary.

NOTE: Initial all figures on this Application and on the Schedule of Values that are changed to correct errors or conform to the amount recommended. Attach explanation of changes that have been made.

**CONTRACTOR's Certification:**

The undersigned CONTRACTOR certifies that (a) all previous progress payments received from OWNER on account of Work done under this Contract have been applied on account to discharge CONTRACTOR's legitimate obligations incurred in connection with Work covered by all prior Applications for Payment; (b) at time of payment, title of all Work, materials and equipment incorporated into said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to OWNER indemnifying OWNER against any such Lien, security interest or encumbrance); and (c) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective; and (d) all manufactured goods or commodities used or supplied for this Project are in compliance with Kansas City's Buy America ordinance.

\_\_\_\_\_  
 Contractor By \_\_\_\_\_ Authorized Representative (Print) \_\_\_\_\_ Signature

Date \_\_\_\_\_

State of )  
 )SS  
 County of )

Subscribed and Sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

My commission expires:

Notary Public: \_\_\_\_\_







## SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project/Contract Number: 80001977/9618 Project Title: Prospect Elevated Water Storage Tanks

From Contractor \_\_\_\_\_ To \_\_\_\_\_ Date \_\_\_\_\_

Spec. No.	Section Title	4	Firm, Address (Check box if Supplier)	Phone, FAX and e-mail	Contact

Attachments:

Signed by: \_\_\_\_\_ Date \_\_\_\_\_

Distribution:  Owner  Contractor  Construction Manager  Design Professional  Consultant  Other





## CERTIFICATE OF SUBSTANTIAL COMPLETION

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

CONTRACT FOR: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

DATE OF ISSUANCE: \_\_\_\_\_

PROJECT OR DESIGNATED PORTION SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Design Professional's and/or Construction Manager's best knowledge, information and belief, to be substantially complete. Substantial Completion is the state in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of Project or portion thereof designated above is hereby established as \_\_\_\_\_ which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

\_\_\_\_\_  
CONSTRUCTION MANAGER BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_  
DESIGN PROFESSIONAL BY \_\_\_\_\_ DATE \_\_\_\_\_

The Contractor will complete or correct the Work on the list of items attached hereto within \_\_\_\_\_ days from the above date of Substantial Completion.

\_\_\_\_\_  
CONSTRUCTION MANAGER BY \_\_\_\_\_ DATE \_\_\_\_\_

\_\_\_\_\_  
DESIGN PROFESSIONAL BY \_\_\_\_\_ DATE \_\_\_\_\_

The Owner accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at \_\_\_\_\_ (time) on \_\_\_\_\_ (date).

\_\_\_\_\_  
OWNER'S REPRESENTATIVE BY \_\_\_\_\_ DATE \_\_\_\_\_

Distribution:  Owner  
 Contractor  
 Construction Manager  
 Design Professional  
 Consultant \_\_\_\_\_  
 Other \_\_\_\_\_



# PUNCH LIST

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

CONTRACTOR \_\_\_\_\_

From \_\_\_\_\_ Site Visit Date \_\_\_\_\_

The following items require the attention of the CONTRACTOR for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the CONTRACTOR to complete all Work in accordance with the Contract Documents.

Item No.	Location (Area)	Description	Correction/Completion Date	Verification Check
----------	-----------------	-------------	----------------------------	--------------------

Attachments

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

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

DESIGN PROFESSIONAL (Firm/In House)

- Distribution:
- OWNER
  - CONTRACTOR
  - DESIGN PROFESSIONAL
  - Consultant \_\_\_\_\_
  - Other \_\_\_\_\_



# CONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

STATE OF \_\_\_\_\_ )  
 )SS  
COUNTY OF \_\_\_\_\_ )

The Undersigned, \_\_\_\_\_ of lawful  
(Name)

age, being first duly sworn, states under oath as follows:

1. I am the \_\_\_\_\_ of \_\_\_\_\_ who is the general  
(Title) (CONTRACTOR)  
CONTRACTOR for the CITY on Project No. \_\_\_\_\_ and Project Title \_\_\_\_\_.

2. All payrolls, material bills, use of equipment and other indebtedness connected with the Work for this Project have been paid and all Claims of whatever nature have been satisfied, as required by the Contract.

3. (✓) \_\_\_ Prevailing wage does not apply; or

(✓) \_\_\_ All provisions and requirements set forth in Chapter 290, Section 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works projects have been fully satisfied and there has been no exception to the full and complete compliance with these provisions and requirements and the Annual Wage Order contained in the Contract in carrying out the Contract and Work. CONTRACTOR has fully complied with the requirements of the prevailing wage law as required in the Contract and has attached affidavits from all Subcontractors on this Project, regardless of tier, affirming compliance with the prevailing wage law as stipulated in the Contract.

4. I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved (\_\_\_%) Minority Business Enterprise (MBE) participation and (\_\_\_%) Women Business Enterprise (WBE) participation on this contract, and (b) listed herein are the names of all certified M/WBE subcontractors, regardless of tier, with whom I, or my subcontractors contracted.

1. Name of MBE/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone Number (\_\_\_\_\_) \_\_\_\_\_  
IRS Number \_\_\_\_\_  
Area/Scope\*of Work \_\_\_\_\_  
Subcontract Final Amount \_\_\_\_\_

2. Name of MBE/WBE Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone Number (\_\_\_\_\_) \_\_\_\_\_  
IRS Number \_\_\_\_\_  
Area/Scope\*of Work \_\_\_\_\_  
Subcontract Final Amount \_\_\_\_\_

List additional subcontractors, if any, on a similar form and attach to the bid.

Supplier\*\* Final Amount: \_\_\_\_\_

\*Reference to specification sections or bid item number.

- (✓) \_\_\_ Met or exceeded the Contract utilization goals; or
- (✓) \_\_\_ Failed to meet the Contract utilization goals (attach waiver, substitution or modification); or
- (✓) \_\_\_ No goals applied to this Project.

5. CONTRACTOR certifies that each Subcontractor has received full payment for its respective work in connection with the Contract.

6. If applicable, I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved, company-wide, at least ten percent (10%) minority workforce participation and two percent (2%) women workforce participation and (2) a true and accurate copy of my final project workforce monthly report (HRD Form 00485.02 and final company-wide workforce monthly report (HRD Form 00485.03) are attached. **NOTE: This paragraph is only applicable if you completed a construction contract that was estimated by the City, prior to solicitation, as requiring more than 800 construction labor hours and costing in excess of \$324,000.01. If applicable you MUST attach copies of your final monthly workforce reports.**

7. This affidavit is made in behalf of the CONTRACTOR for the purpose of securing from Kansas City, Missouri, the certification of completion of the Project and receiving payment therefore.

8. If the Contract amount exceeded \$150,000, CONTRACTOR has submitted proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue and has on file proof of tax compliance from all Subcontractors. If the Contract term exceeded one (1) year, CONTRACTOR has provided proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue prior to receiving final payment and has on file proof of tax compliance from all Subcontractors prior to the Subcontractor receiving final payment from CONTRACTOR.

CONTRACTOR \_\_\_\_\_

By \_\_\_\_\_  
(Authorized Signature)

Title \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, before me appeared \_\_\_\_\_, to me personally known to be the \_\_\_\_\_ of the \_\_\_\_\_,

and who executed the foregoing instrument and acknowledged that (s)he executed the same on behalf of \_\_\_\_\_ as its free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year first above written.

My commission expires:

\_\_\_\_\_  
Notary Public



# SUBCONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

STATE OF MISSOURI )

) ss:

COUNTY OF \_\_\_\_\_ )

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated below (hereinafter Subcontractor) and I make this affidavit on behalf of Subcontractor in accordance with the requirements set forth in Section 290.290, RSMo. Subcontractor has completed all of the Work required under the terms and conditions of a subcontract as follows:

Subcontract with: \_\_\_\_\_, Contractor

Work Performed: \_\_\_\_\_

Total Dollar Amount of Subcontract and all Change Orders: \$ \_\_\_\_\_

City Certified  MBE  WBE  DBE  NA

List certifications: \_\_\_\_\_

2. Subcontractor fully complied with the provisions and requirements of the Missouri Prevailing Wage Law set forth in Sections 290.210, RSMo through 290.340, RSMo.

**Business Entity Type:**

- Missouri Corporation
- Foreign Corporation
- Fictitious Name Corporation
- Sole Proprietor
- Limited Liability Company
- Partnership
- Joint Venture
- Other (Specify)

**Subcontractor's Legal Name and Address**

\_\_\_\_\_

Phone No. \_\_\_\_\_

Fax: \_\_\_\_\_

E:mail: \_\_\_\_\_

Federal ID No. \_\_\_\_\_

I hereby certify that I have the authority to execute this affidavit on behalf of Subcontractor.

By: \_\_\_\_\_

(Signature)

\_\_\_\_\_

(Print Name)

\_\_\_\_\_

(Title)

\_\_\_\_\_

(Date)

**NOTARY**

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

My Commission Expires: \_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

## SECTION 01320 – CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes administration and procedural requirements for documenting the construction process beginning with the Notice of Intent to Contract and continuing through completion of the Work performed and Construction Contract close out.
- B. The Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with these requirements including but not limited to the following and as required herein:
  - 1. Preliminary Project Schedule.
  - 2. Project Baseline Schedule.
  - 3. Progress Schedule.
  - 4. Recovery Schedules.
  - 5. Submittals Schedule.
  - 6. Daily Labor Force reports.
  - 7. Material location reports.
  - 8. Field condition reports.
  - 9. Special reports.
  - 10. Photographic Documentation.
- C. Drawings and general provisions of the Contract; including General and Supplementary Conditions, all applicable Division 01 Sections, and all applicable Division Sections; apply to this Section.
- D. Related Work Specified Elsewhere:
  - 1. Section 00700 – General Conditions
    - a. Article 2, paragraph 2.06.B.1 – Preliminary Project Schedule.
    - b. Article 2, paragraph 2.06.B.2 – Preliminary Schedule of Shop Drawings.
    - c. Article 2, paragraph 2.07.A – Acceptable Schedule.
    - d. Article 2, paragraph 2.07.B – Project Baseline Schedule.
    - e. Article 6, paragraph 6.04 – Progress Schedule.
    - f. Article 6, paragraph 6.05 – Recovery Schedule.
  - 2. Section 01015 – Specific Project Requirements.
  - 3. Section 01322 – Photographic Documentation.

#### 1.03 SPECIFICATION MODIFICATIONS:

- A. It is understood this specification may be modified by appropriate items in Section 01015.

#### 1.04 CODES AND STANDARDS :

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. American Association of Cost Engineers (AACE):
  - 1. Comply with recommended practices.

1.05 SUBMITTALS:

- A. Schedule of Submittals: Submit in native electronic format, PDF format and six hard copies of schedule prior to the preconstruction conference. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - 2. Specification Section number and title.
  - 3. Submittal category (technical or informational).
  - 4. Name or Subcontractor of Supplier.
  - 5. Description of the Work covered.
  - 6. Scheduled date for Engineer's final release or approval.
- B. Preliminary Construction Progress Reports: Submit six hard copies and in PDF format prior to preconstruction conference.
- C. Construction Progress Reports: Submit four copies and in PDF format at monthly intervals with application for payment.
- D. Daily Construction Reports: Submit four hard copies and in PDF format at monthly intervals.
- E. Field Condition Reports: Submit four hard copies and in PDF format at time of discovery of differing conditions.
- F. Special Reports: Submit four hard copies and in PDF format at time of unusual event.

1.06 DEFINITIONS:

- A. Activity
  - 1. A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 2. Critical activities are activities on the critical path. They must start and finish on the planned start and finish times.
  - 3. Predecessor activity is an activity that must start or complete before a given activity can be started. No negative lag is allowed.
  - 4. Successor activity is an activity that can not start until the predecessor activity allows it. No negative lag is allowed.
- B. CPM (Critical Path Method) A schedule network analysis technique used to – determine the amount of scheduling flexibility (the amount of float) on various logical network paths in the project schedule network, and to determine the minimum total project duration. Start and finish dates are calculated by means of a forward pass, using a specified start date. Late start and finish dates are calculated by means of a backward pass, starting from a specified completion date, which sometimes is the project early finish date determined during the forward pass.
- C. Critical Path Generally, but not always, the sequence of schedule activities determining the duration of the project. Generally, it is the longest path through the project. However, a critical path can end, as an example, on a schedule milestone that is in the middle of the schedule model and that has a finish-on -or-before imposed date schedule constraint.
- D. Event – The starting or ending point of an activity.
- E. Float – The measure of leeway in starting and completing an activity. Float time is not for the exclusive use or benefit of either City or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date. Free float is the amount of time an activity

can be delayed without adversely affecting the early start of the following activity. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

- F. Fragnet – A partial or fragmentary network that breaks down activities into smaller – activities for greater detail.
- G. Gantt Chart – A graphic display of schedule-related information. In the typical Gantt chart, schedule activities or work breakdown structure components are listed down the left side of the chart, dates are shown across the top and activity durations are shown as date-placed horizontal bars. Also known as a Bar chart.
- H. Lag – An offset or delay from an activity to its successor. It is based on the calendar of the successor activity.
- I. Major Area – A significant construction element.
- J. Major Procurement – As discussed in Section 00700, paragraph 2.07.B.1, Major Procurement shall further defined as any materials that fall within the critical path and/or have a lead time of 30 days or greater.
- K. Milestone – A key or critical point in time for reference or measurement.
- L. Network Diagram – A graphic diagram of a network schedule, showing activities and activity relationships.
- M. Schedule Level – A project team specified rule for the relative granularity of schedule activities in an overall schedule model. Following are the descriptions and levels of detail for each schedule level:
  - 1. Level 1 – Project Summary Schedule This is a summary level schedule that highlights major project activities, milestones and key deliverables.
  - 2. Level 2 – Project Phase Summary Schedule This is a more extensive summary level schedule that includes all information from the Level 1 schedule and breaks down the project into major components by area or phase.
  - 3. Level 3 – Detail Schedule This level will show detail plans to accomplish. Procurement, Construction, Testing and Start-up. Such schedules will have logical relationships integrated between the activities and organized in such a manner to create a Critical Path and facilitate critical path analysis. It will include all milestones and major elements and will be used to support monthly progress reporting.
  - 4. Level 4 – Detailed Schedule by Work Package This level will include detailed information by each work package and display all activities to be accomplished by the workforce with durations of 7 or more calendar days.
  - 5. Level 5 – Detailed Schedule by Task This level of detail will support the short-term planning for the field, normally for those activities of less than 1-week duration. It is used for workforce supervisors to plan and coordinate work at the detail level.
- N. WBS (Work Breakdown Structure) – A deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project. Each descending level represents an increasingly detailed definition of the project work. The WBS is decomposed into work packages. The deliverable orientation of the hierarchy includes both internal and external deliverables. See also Schedule Levels.
- O. Work Package A deliverable or project work component at the lowest level of each branch of the WBS. The work package includes the schedule activities and schedule

SECTION 01320 – CONSTRUCTION PROGRESS DOCUMENTATION: continued

milestones required to complete the work package deliverable or project work component.

- P. Schedule of Monthly Payments Estimated monthly progress payments based on Baseline Schedule and Schedule of Values for each Month for the duration of the project.

1.07 COORDINATION:

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities including the scheduling and reporting of separate Contractors performing construction activities related to project.
- B. Coordinate Progress Schedules with the Schedule of Values, to estimate a Schedule of Monthly Payments, list of subcontractors, Preliminary Schedule of Shop Drawings and Samples, progress reports, Application for Payment, and other required schedules and reports.
- C. Secure time commitments for performing critical elements of the Work from parties involved. Time commitments should be captured within the schedule.

1.08 SCHEDULE LEVEL:

- A. The Schedule Level (see paragraph 1.06M) to be used for this project shall be as specified in Section 01015.
- B. If a Recovery Schedule is deemed necessary by the City in accordance with Section 00700, it shall be developed as a Schedule Level 5 regardless of the requirements listed in Section 01015.

1.09 SCHEDULE SOFTWARE:

- A. Prepare schedules using the latest version of Primavera version P6 or higher or Microsoft Project. See Section 01015 for additional or specific software requirements.

1.10 PRELIMINARY SCHEDULE OF SHOP DRAWINGS AND SAMPLES:

- A. Preparation Provide a schedule of submittals arranged in chronological order by date required by the construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery as set forth in the Contract Documents, when establishing dates.
- B. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, the estimated Schedule of Monthly Payments, and Progress Schedules.
- C. Include Shop Drawing and Sample Submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
- D. At Contractor's option, show submittals on the Preliminary Progress Schedule, instead of tabulating them separately.

1.11 SCHEDULE REQUIREMENTS

- A. Requirements According to Schedule Level Contractor shall provide the following information based in the Schedule Level defined in Section 01015. An “X” indicates that the requirement is applicable to the Schedule Level.

**Table 1. Schedule Requirements**

Item	Requirements	Schedule Level				
		1	2	3	4	5
Procedures	Comply with procedures contained the American Association of Cost Engineers (AACE) recommended practices.	X	X	X	X	X
Time Frame	Extend project schedule from date established for the Notice to Proceed to the date of Final Completion.	X	X	X	X	X
Contract Times	Contract Times shall not be changed unless specifically authorized by Change Order.	X	X	X	X	X
Activities	Treat separate major areas as a separate numbered activity for each principal element of the Work. (WBS)	X	X	X	X	X
Activity	Define activities so none is longer than 20 days, unless specifically allowed by City	X	X	X	X	X
Duration	Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.	X	X	X	X	X
Computer Software	Prepare schedules using the latest version of Primavera version P6 or higher or Microsoft Project. Refer to Section 01015 for project specific requirements.		X	X	X	X
Scheduler's Qualifications	Submit scheduler's qualifications for review and approval			X	X	X
Submittal Review Time	Include review and re-submittal times for review of Shop Drawings and Samples. Each item listed in the Preliminary Schedule of Shop Drawings and Samples shall be included in the schedule.			X	X	X
Procurement Activities	Include separate activities for the procurement process of long-lead and major items that require a cycle of more than 30 days or fall within the critical path. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.			X	X	X
Startup and Testing Time	Include not less than two days for startup and testing.			X	X	X
Constraints	Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected		X	X	X	X
Phasing	Arrange list of activities on schedule by phase.		X	X	X	X
Work by City	Include a separate activity for each area of the Work performed by City.		X	X	X	X
Products Ordered in Advance	Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.		X	X	X	X
City-Furnished Products	Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.		X	X	X	X
Work Restrictions	Show the effect of the following items on the schedule: <ul style="list-style-type: none"> <li>• Coordination with existing construction.</li> <li>• Limitations of continued occupancies.</li> <li>• Uninterruptible services.</li> <li>• Partial utilization before Substantial Completion.</li> <li>• Use of premises restrictions.</li> <li>• Provisions for future construction.</li> <li>• Seasonal variations.</li> <li>• Environmental control.</li> </ul>			X	X	X

**Table 1. Schedule Requirements**

Item	Requirements	Schedule Level				
		1	2	3	4	5
Work Stages	Show the effect of the following items on the schedule: <ul style="list-style-type: none"> <li>• Subcontract awards,</li> <li>• Submittals.</li> <li>• Purchases.</li> <li>• Fabrication.</li> <li>• Sample Testing.</li> <li>• Deliveries,</li> <li>• Installation.</li> <li>• Tests and inspections.</li> <li>• Adjusting</li> <li>• Curing.</li> </ul> Startup and placement into final use.			X	X	X
Area Separation	Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities: <ul style="list-style-type: none"> <li>• Contractor Mobilization*</li> <li>• Procurement Divided by Long Lead And Short Lead–</li> <li>• Completion of civil work</li> <li>• Completion of structural work</li> <li>• Completion of mechanical installation</li> <li>• Completion of electrical installation</li> <li>• Partial Utilization</li> <li>• Substantial Completion*</li> <li>• Achievement of Full Operations*</li> <li>• Punch List and Final Corrections*</li> <li>• Final Completion*</li> </ul> *Required element, all others to be used as applicable based on project scope.			X	X	X
Contract Modifications	For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.		X	X	X	X
Work under More than One Contract or Subcontract	Include a separate activity for each contract or subcontract.			X	X	X
Detailed by Work Package	Include detailed information by each work package and display all activities to be accomplished by the workforce with durations of 7 or more calendar days.				X	X
Detail by Tasks	Include detail by task to support the short-term planning for the field, normally for those activities of less than 1-week duration.					X

**B. Cost Correlation:**

1. Requirement to provide a Cost Correlation shall be indicated in Section 01015.
2. At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

**1.12 SCHEDULE REQUIREMENTS:**

SECTION 01320 – CONSTRUCTION PROGRESS DOCUMENTATION: continued

- A. Indicate each significant construction activity separately. Identify each Monday of each week with a continuous vertical line. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work.
- B. Preliminary Network Diagram Outline significant construction activities for the – project. To be submitted with the Preliminary Progress Schedule.

1.13 PROGRESS SCHEDULES:

- A. General – Prepare Progress Schedules using a CPM network analysis diagram.
- B. CPM Schedule Preparation – Prepare a list of all activities required to complete the – Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths:
  - 1. Activities Indicate the estimated time duration, sequence requirements, and – relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Purchase of materials.
    - c. Delivery of materials and equipment.
    - d. Fabrication.
    - e. Installation.
  - 2. Processing Process data to produce output data or a computer-drawn time scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  - 3. Format Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges:
    - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
    - b. Establish procedures for monitoring and updating CPM schedule and for reporting progress monthly. Coordinate procedures with progress meeting and payment request dates.
    - c. Use “one calendar day” as the unit of time.
  - 4. Initial Issue of Schedule Prepare initial network diagram from a list of straight – “early start-total float” sort. Identify critical activities. Prepare tabulated reports showing the following:
    - a. Contractor or subcontractor and the Work or activity.
    - b. Description of activity.
    - c. Principle events of activity.
    - d. Immediate preceding and succeeding activities.
    - e. Early and late start dates.
    - f. Early and late 'finish dates.
    - g. Activity duration in days.
    - h. Total float or slack time.
    - i. Average size of workforce.
  - 5. Schedule Updating Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

- a. Identification of activities that have changed added or deleted.
  - b. Changes in logic ties.
  - c. Changes in early and late start dates.
  - d. Changes in early and late finish dates.
  - e. Changes in activity durations in days.
  - f. Changes in the critical path.
  - g. Changes in total float or slack time.
  - h. Changes in the Contract Time.
6. Value Summaries Prepare two cumulative value lists, sorted by finish dates:–
- a. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
  - b. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
  - c. In subsequent issues of both lists, substitute actual finish dates for activities completed as of last date.
  - d. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
  - e. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
  - f. Submit value summary printouts one week before each regularly scheduled progress meeting.
- C. Reports:
1. Daily Labor Force Reports Prepare a daily labor force report recording the – following information concerning events at Project site:
    - a. List of subcontractors at Project site.
    - b. List of separate contractors at Project site.
    - c. List of all the Contractor's and subcontractor's personnel showing hours worked in labor class at Project site.
  2. Material Location Reports At monthly intervals, prepare a comprehensive list – of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
  3. Field Condition Reports Immediately on discovery of a difference between – field conditions and the Contract Documents, prepare a detailed report. Submit electronically and directly to City with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Special Reports:
- a. General Submit special reports within one day of an occurrence.
  - b. Reporting Unusual Events When an event of an unusual and significant nature – occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events; persons participating; response by Contractor's personnel; evaluation of results or effects; and similar pertinent information. Advise City in advance when these events are known or predictable.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 PROGRESS SCHEDULES:

- A. Updates – At monthly intervals, update schedule to reflect actual construction progress and activities. Progress Schedule should be provided for review and approval prior to monthly pay request. Progress Schedules will be reviewed and discussed at regularly schedule progress meetings. Contractor shall bring printed copies of CPM Schedule.
1. Revise schedule immediately after an activity revision has been recognized or made at the direction by the City. Issue updated schedule concurrently with the report of each such progress meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate actual completion percentage for each activity.
  4. Post copies in Project meeting rooms and temporary field offices.

END OF SECTION 01320



## DAILY FIELD OBSERVATION REPORT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

Contractor \_\_\_\_\_

Report Number \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

### Weather

Clear     Snow  
 Overcast     Foggy  
 Rain     Cold

### Site Conditions

Warm     Clear     Dusty  
 Hot     Muddy     \_\_\_\_\_  
 Temperature Range \_\_\_\_\_

### Day

Monday     Thursday  
 Tuesday     Friday  
 Wednesday     \_\_\_\_\_

Persons Contacted: \_\_\_\_\_

Work Observed: \_\_\_\_\_

Items Discussed: \_\_\_\_\_

Materials Delivered: \_\_\_\_\_

Requested Revisions or Interpretations: \_\_\_\_\_

Nonconforming Work Reported This Date To Contractor: \_\_\_\_\_

Remarks: \_\_\_\_\_

Attachments \_\_\_\_\_

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

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

Distribution:  Owner  
 Contractor  
 Construction Manager  
 Design Professional  
 Consultant \_\_\_\_\_  
 Other \_\_\_\_\_



# PERIODIC FIELD OBSERVATION REPORT

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

Contractor \_\_\_\_\_

Report Number \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Weather

- Clear     Snow  
 Overcast     Foggy  
 Rain     Cold

- Warm  
 Hot  
 Temperature Range \_\_\_\_\_

Site Conditions

- Clear     Dusty  
 Muddy     \_\_\_\_\_  
 Temperature Range \_\_\_\_\_

Day

- Monday     Thursday  
 Tuesday     Friday  
 Wednesday     \_\_\_\_\_

Persons Contacted:

Work Observed:

Items Discussed:

Remarks:

Attachments

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

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

- Distribution:  Owner  
 Contractor  
 Construction Manager  
 Design Professional  
 Consultant \_\_\_\_\_  
 Other \_\_\_\_\_



# WEEKLY REPORT OF WORKING DAYS

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

Contractor \_\_\_\_\_

Report Number \_\_\_\_\_ Week Ending: \_\_\_\_\_

DATE:	WORKING DAY	REMARKS		
TOTAL THIS WEEK	PREVIOUSLY	TOTAL TO DATE	WORKING DAYS IN CONTRACT	REMAINING OR OVERTIME

Signed by OWNER'S REPRESENTATIVE \_\_\_\_\_ Date: \_\_\_\_\_

Signed by CONTRACTOR \_\_\_\_\_ Date: \_\_\_\_\_

Distribution:  OWNER  CONTRACTOR  Construction Manager  Design Professional  Consultant  Other

## SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section outlines the requirements for photographic and video documentation. The Contractor is solely responsible for the development of an overall plan to fully document Site conditions and the progress of the Work.
- B. The Contractor shall hire a professional photographer to provide the services and deliverables described herein.
- C. Related Work Specified Elsewhere:
  - 1. Section 00700 – General Conditions.
  - 2. Section 00800 – Supplementary Conditions.
  - 3. Section 01015 – Specific Project Requirements.
  - 4. Section 01320 – Construction Progress Documentation.
  - 5. Section 01340 – Submittals.

#### 1.02 REFERENCES

- A. American Public Works Association – Kansas City Metropolitan Chapter (APWA):
  - 1. APWA Division II Section 2500 – Sanitary Sewer Piping Requirements (APWA-KCMO 2500).

#### 1.03 SPECIFICATION MODIFICATIONS

- A. It is understood that throughout this section these Specifications may be modified by appropriate items in Section 01015 or as otherwise indicated in the contract documents.

#### 1.04 DEFINITIONS:

- A. Preconstruction Video: A video taken to document Site conditions prior to the start of construction.
- B. Preconstruction Photographs: Photographs taken to document Site conditions prior to the start of construction. All Pre-Construction Photographs shall be digital, indexed on an interactive map and shown on a View Location Map.
- C. Construction Progress Photographs: Digital photographs taken to document the progress of construction.
- D. Construction Activity Photographs: Digital photographs taken to document specific construction activities.
- E. Post-Construction Photographs: Digital photographs taken after final restoration to document the finished condition of the Site.
- F. Affidavit of Authenticity: The photographer’s signed and notarized affidavit, attesting to the production of the original photographs, videos and their authenticity.

#### 1.05 SUBMITTALS

- A. Submit as specified in Section 01340 and in Part 3 of this Section.
- B. Phasing Plan: If applicable, submit for review and approval a phasing plan for Pre-Construction Photographs and Video.
- C. Photographer’s Qualifications: Submit for review and approval the qualification information demonstrating the photographer meets the requirements of paragraph 1.06 of this Section.
- D. Preconstruction Photographs: Submit for review and approval digital preconstruction photographs with a n interactive index map Photograph, Navigation System (see paragraph 2.05 of this Section) and affidavit of authenticity.

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

- E. Preconstruction Video: Submit for review and approval a preconstruction video with a Video Navigation System (see paragraph 2.05 of this Section) and affidavit of authenticity (see paragraph 1.04 of this Section).
- F. Construction Progress Photographs: On a monthly basis, submit digital construction photographs, interactive index map and affidavit of authenticity.
- G. Construction Activity Photographs: On a monthly basis, submit digital activity photographs (if different than progress photographs), interactive index map and affidavit of authenticity.
- H. Postconstruction Photographs/Video: Submit for review and approval digital postconstruction photographs or video, interactive index map and affidavit of authenticity.
- I. Photographer shall submit two sample prints and digital image files of the type and quality required during construction, for review and acceptance by Engineer.
- J. Perform and submit closed circuit television inspection of storm lines and sewer lines in accordance with APWA-KCMO 2500 for all new and replaced sewer lines.

1.06 QUALIT ASSURANCE

- A. The Contractor is responsible for the quality assurance and quality control of the Work.
- B. General Quality: Photographs and video shall be clear and of sufficient quality to show relevant detail. They shall not be blurred, taken in shadow or too far away to provide conclusive information. The City may require that the photographs or video be retaken should the quality be insufficient. Costs for such re-takes are the Contractor’s sole responsibility and shall be done at no extra cost to the City.
- C. Qualifications of Photographer: The Contractor shall engage the services of a professional photographer with a minimum of 3 years of experience in construction photography to document the conditions of the project site. Upon request, samples of the photographer’s prior work and/or references shall be submitted.
- D. Affidavit of Authenticity: The Contractor shall provide the photographer’s signed and notarized affidavit, attesting to the production of the original photographs, videos and their authenticity. An affidavit of authenticity shall be provided with each submittal/deliverable .

1.07 MINIMUM REQUIREMENTS

- A. The section specifies several different sets of photographic and video documentation requirements. The extent of documentation will depend upon the size and type of the project. The following table summarizes the basic documentation requirements.

**Table 1. Summary of Requirements**

<b>Set of Documentation</b>	<b>Mandatory</b>	<b>As Required by Section 01015</b>
Preconstruction Video		X
Haul Route Video		X
Preconstruction Photographs	X	
Interactive Index Map		X
Construction Progress/Activity Photographs		X

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

Postconstruction Photographs/Video		X
------------------------------------	--	---

1.08 OWNERSHIP

- A. The photographs and videos shall become the sole property of the City.

1.09 SCHEDULES

- A. Schedule of Values: Photographic/Video documentation shall be listed as one line item in the Schedule of Values.
- B. Construction Progress Documentation: Each set of photographs or videos shall be listed in the Preliminary Project Schedule as a discrete activity. See Section 01320 Construction–Progress Documentation.

1.10 PHASING

- A. Based on the nature and scope of the Work, the Contractor may phase the Preconstruction Photographs and Video. If phasing is to be implemented, the following shall apply:
  - 1. The Contractor shall submit a Phasing Plan that identifies each area of the Work.
  - 2. For each phase, Preconstruction Photographs and Videos shall be taken within 21 days of the start of construction activities unless otherwise approved in writing by the City.
- B. Under no circumstances shall construction begin in any area until the Preconstruction Photographs and/or Video have been submitted and approved by the City or Engineer.

PART 2 - PRODUCTS

2.01 PHOTOGRAPH QUALITYPHOTOGRAPH AND VIDEO NAVIGATION SYSTEM

- A. If specified in Section 01015, the Contractor shall provide an electronic photographic and video navigation system (navigation system) for searching and viewing recorded imagery.
- B. Interactive Index Map: The navigation system shall indicate the general location of each area photographed or video recorded using icons and other suitable mark-ups on the actual construction drawings in PDF format.
- C. The navigation system shall utilize standard PDF-reader software (such as Adobe Reader, Acrobat, or Bluebeam Vu) or other software that shall be included with the deliverables. Icons shall be individually hyperlinked to the respective photograph, video, affidavit of authenticity and media log file for immediate playback in Windows Media Player, VLC or other players.
- D. The navigation system shall include the following:
  - 1. Project name.
  - 2. Project number.
  - 3. Contract number.
  - 4. Name of City.
  - 5. Name of Contractor.
  - 6. Name of Engineer.
  - 7. Ranges of dates for which the photographs or videos were taken.
  - 8. The name of the photographer.
  - 9. Affidavit of Authenticity.
  - 10. Media log.
  - 11. Photographs.
  - 12. Videos.

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

- E. A navigation system shall be provided for each set of photographs and videos taken.

2.02 PHOTOGRAPHIC AND VIDEO REQUIREMENTS:

- A. Specified in PART 3 of this Section.

PART 3 - EXECUTION

3.01 PRIOR TO PHOTOGRAPHIC AND VIDEO DOCUMENTATION:

- A. Construction Limits: Prior to the Preconstruction Photographs and Video, the Contractor shall flag or mark the construction limits and excavation areas for identification, and project centerlines shall be physically marked with survey stakes and/or high visibility paint (including station numbers).
- B. Mark Utilities: Prior to the Preconstruction Photographs or Video, the Contractor shall notify utilities and have them marked so that utility locations are documented.
- C. Coordinate with City: For any work that requires a representative of the City to be present, the Contractor shall provide the City a minimum of 2 days' notice .

3.02 PRECONSTRUCTION VIDEO:

- A. If specified in Section 01015, the Contractor shall provide a preconstruction video.
- B. Scope: Prior to the start of construction, the Contractor shall prepare a color video recording with audio of all the areas to be affected by construction. All preconstruction video recordings shall have sufficient detail to reveal the condition (including defects and damage) of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, creek banks, trees, structures, foundations and other such items along the construction route and in the immediate adjacent areas, which might be affected by the construction operations. In addition, the videographer shall move beyond the construction zone as needed to ensure documentation of features and areas that may not be adequately recorded from the centerline rotations. Videos shall be taken on both sides of the street when construction is in or along a roadway (use this approach along drainage channels and in other similar situations).
- C. Schedule: Taken after utilities have been marked and prior to the placement of materials or equipment on the Site. Videos shall be submitted to the City for review and approval. Under no circumstances shall construction begin until the preconstruction video has been submitted and approved.
- D. The preconstruction video recording shall be done in the presence of a representative of the City.
- E. The Contractor shall document all pre-existing site conditions/elements of the Site, the same as listed for the Preconstruction Photographs.
- F. The video documentation shall provide a clear and continuous view of the project showing all visible utilities and features within the limits of construction.
- G. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen or in the video file metadata properties digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).
- H. The audio/video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of the original live recordings and thus shall not be copies of other audio or video recordings.

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

- I. The audio track shall contain the narrative commentary. Ample descriptive narrative shall be recorded simultaneously during all recordings. Narration shall include clearly audible comments that will deliver station number and/or street address, locations, direction of view and rotation.
- J. Typical video segments should not exceed 10 minutes in length.
- K. Rotations of 360-degrees shall be at the beginning and end of each video segment and at each 100-foot increment throughout the video.
- L. The rate of speed in the general direction of travel of the conveyance used during recording shall be controlled to provide a usable image. On average, the rate of forward travel during videotaping shall not be less than fifteen minutes for every 1000 linear feet of pipeline route or street centerline.
- M. Panning rate, zoom-in rate and zoom-out rate shall be controlled sufficiently such that playback will provide clarity of the object viewed.
- N. All recording shall be done during times of good visibility. No recording shall be done during periods of precipitation unless authorized by the City.

3.03 HAUL ROUTE VIDEO

- A. If specified in Section 01015, the Contractor shall provide preconstruction video documentation of all haul routes associated with the Project.
- B. Haul route videos shall be made at the time of the Preconstruction Photographs.
- C. Haul route videos shall meet the requirements of the paragraph 3.02 of this Section as well as the following:
  - 1. Haul routes shall be recorded during daylight hours and during good weather conditions.
  - 2. Video equipment may be mounted on a vehicle. The speed of the vehicle while recording shall not be more than 5 miles per hour (mph). If traffic or safety concerns prohibit driving 5 mph then the video shall be taken while walking the route .
  - 3. No audio/narrative commentary is required for the haul route video

3.04 PRECONSTRUCTION PHOTOGRAPHS

- A. The Contractor shall provide preconstruction photographs as specified in this Section and in Section 01015.
- B. Scope: The purpose for preconstruction photo documentation is to record existing conditions, damage and features on or adjacent to the project site .The principal reason for obtaining photographs is so that items such as cracked curbs, broken pavement, plugged culverts, driveway conditions, yard conditions, Prospect Pump Station building conditions, Grandview’s ground storage tank conditions and other existing conditions located in the Project Site may be clearly shown and documented. This will to some degree mitigate the possibility of postconstruction restoration issues with property owners in the Project area.
- C. Schedule: Take photographs after utilities have been marked, prior to placement of materials or equipment on the Site and prior to the start of construction activities in an area. Photographs shall be submitted to the City for review and approval. Under no circumstances shall construction begin until the preconstruction photographs have been submitted and approved.
- D. Preconstruction photographs shall be taken at sufficient intervals to be able to carefully document the preconstruction conditions of the Site and in no case more than 50-foot intervals along the street, right-of-way, drainage easement and water/wastewater line route before commencement of the work.
- E. In addition, select photographs shall be taken as needed along the construction limits, and of adjacent properties, to ensure documentation of features and areas that may not be adequately

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

- recorded in the centerline rotations. Photographs shall be taken along both sides of the street when construction is in or along a roadway.
- F. Overlapping composition techniques shall be employed to ensure maximum photographic coverage.
  - G. Preconstruction photographs shall be taken after the utility locations have been marked.
  - H. Preconstruction photographs shall be taken with a representative of the City present unless otherwise authorized by the City.
  - I. All preconstruction photographs shall have sufficient detail to reveal the condition (including defects and damage) of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, Prospect Pump Station building, Grandview’s ground storage tank, trees, structures, foundations and other such items along the construction route, and adjacent areas which might be affected by the construction operations. An identifier (such as house or business address/signs, property numbers, mailboxes, landscaping, etc) shall be included when practical in each view for ease of identification.
  - J. At a minimum, preconstruction photographs must be taken of the following views:
    - 1. The entire street right of way and limits of construction; whichever is greater.
    - 2. The entire easement width and length (both permanent and temporary).
    - 3. All driveways, and sidewalks.
    - 4. Fence and gate conditions.
    - 5. Other privately or publicly owned features or facilities that might be disturbed by the construction.
    - 6. Views of structures (including Prospect Pump Station building), both inside and adjacent to the project site and easements in areas where the Contractor will be working within five (5) feet of said structure.
    - 7. Prominent utility features, such as: guy wires, poles, signs, valves, fire hydrants, meters, pull boxes, etc.
    - 8. At the discretion of the Contractor, photograph offsite roadways that will be subjected to heavy usage such as for haul routes or delivery of heavy components or equipment. Refer to Paragraph 3.03 of this Section for additional requirements.
    - 9. Other significant or prominent features to protect the City and the Contractor following construction (e.g. close-up photographs of pre-existing broken curbs, cracked/failed pavement, damaged adjacent retaining walls, etc.).
    - 10. Views of structures, both inside and adjacent to the ROW/easement in areas where the Contractor will be working within five (5) feet of said structure.
    - 11. Other views as requested by the City.

3.05 CONSTRUCTION PROGRESS PHOTOGRAPHS:

- A. If specified in Section 01015, the Contractor shall provide Construction Progress Photographs.
- B. Scope: The Contractor shall provide construction progress photographs to depict the progress of the work. The Contractor shall be responsible for photographs of the Site to show the existing and general progress of the Work. The City will advise as to which views are of interest.
- C. Schedule: Photographs shall be taken at the time of the Preconstruction Photographs, a minimum of once per month throughout the duration of the Project, and at the time of the Post Construction Photographs. Construction Progress Photographs are to be submitted each month with the Contractor’s Application for Payment. Applications for Payment was not be considered acceptable until the photographs are provided.
- D. This set of photographs will be taken as close as possible to the same locations and views of the preconstruction photography.

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

3.06 CONSTRUCTION ACTIVITY PHOTOGRAPHS:

- A. If specified in Section 01015, the Contractor shall provide Construction Progress Photographs.
- B. Scope: The Contractor shall provide photographs taken to document Site conditions and specific construction activities throughout the duration of the Project.
- C. Schedule: Photographs shall be taken two times per month (every two weeks) for the duration of the Project.
- D. Construction Activity Photographs are to be submitted each month with the Contractor's Application for Payment.
- E. Photographs shall be taken to depict the work accomplished during the month. These photographs are to include, but are not limited to, the following:
  - 1. Work not yet covered up.
  - 2. When mechanical, electrical, plumbing or building inspections are scheduled.
  - 3. The beginning of installation of major items of equipment.
  - 4. After installation of major items of equipment.
  - 5. Other significant construction activities.
  - 6. As directed by the City.

3.07 POSTCONSTRUCTION PHOTOGRAPHS:

- A. If specified in Section 01015, the Contractor shall provide Postconstruction Photographs.
- B. Scope: The Contractor shall provide Postconstruction Photographs of the project area that documents the final restoration and construction improvements. Postconstruction photographs shall show the general condition of the construction zone (recording finished landscape and other restoration, plus construction improvements), and other areas that may have been affected by construction activities.
- C. Schedule
  - 1. Photographs shall be taken after completion of the Substantial Completion punch list when the project is complete, the Site is restored to the satisfaction of the City, and before submission of the Application for Final Payment.
  - 2. Postconstruction photographs shall be taken after all items have been address from the Substantial Completion inspection, after cleanup and site restoration, and before application for final payment.
- D. Postconstruction Photographs are to be submitted with the Contractor's Application for Final Payment.
- E. The Contractor shall coordinate the schedule of the postconstruction photographs with the City's Project Manager and shall provide at least 5 days written notice to allow the City's Representative to be present when the photographs are taken.

3.08 POSTCONSTRUCTION VIDEO:

- A. If specified in Section 01015, the Contractor shall provide a postconstruction video.
- B. Scope: The Contractor shall prepare a color video recording with audio of all the areas affected by construction. All Postconstruction video recordings shall have sufficient detail to reveal the final, restored condition of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, creek banks, trees, structures, foundations, and other such items along the construction route, and in the immediate adjacent areas, which might have been affected by the construction operations. In addition, videographer shall move beyond the construction zone as needed to ensure documentation of features and areas that may not be adequately recorded from the centerline rotations. Videos shall be taken on both sides of the street when construction is in or along a roadway (use this approach along drainage channels and in other similar situations).

SECTION 01322 – PHOTOGRAPHIC DOCUMENTATION: continued

- C. Schedule: The postconstruction video shall be taken in conjunction with the postconstruction photographs.
- D. Postconstruction videos are to be submitted with the Contractor’s Application for Final Payment.
- E. Unless otherwise authorized by the City, the postconstruction video recording shall be done with a representative of the City present.
- F. The Contractor shall document all postconstruction site conditions/elements of the Site as listed for the Postconstruction Photographs.
- G. The video documentation shall provide a clear and continuous view of the project alignment showing all visible utilities and features within the limits of construction.
- H. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).
- I. The audio video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of original live recordings and thus shall not be copies of other audio and video recordings.
- J. The audio track shall contain the narrative commentary. Ample descriptive narrative shall be recorded simultaneously during all recordings. Narration shall include clearly audible comments that will deliver station number and/or street address locations, direction of view and rotation.
- K. Typical video segments should not exceed 10 minutes in length.

3.09 DELIVERABLES:

- A. Refer to Section 01015 for additional deliverable required for the Project.
- B. Delivery of the documentation record shall be made as soon as is practical after the images are recorded. Deliverables include original photographs in JPG format, photographs converted to pdf format, interactive map index and navigation system.
- C. Electronic Storage Devices: Submit the navigation system non-returnable USB compatible flash drive. Submittals shall conform to the following:
  - 1. Submit with the monthly invoice two sets of digital photographs and/or videos. Each set shall be contained on a separate electronic storage device.
  - 2. Each set shall be cumulative of all photographs and/or videos taken to date.
  - 3. Affidavit(s) of Authenticity shall be included in a digital format.
- D. Document Management System: Unless otherwise noted in Section 01015, all deliverables shall be provided in an electronic format using the specified document management system and in accordance with paragraph 1.05 of this Section.

END OF SECTION 01322



# TRANSMITTAL LETTER

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

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TO: \_\_\_\_\_ Date \_\_\_\_\_  
 \_\_\_\_\_ Re: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

ATTN: \_\_\_\_\_

---

- We are sending you  Attached  Under separate cover via \_\_\_\_\_ the following items:  
 Shop Drawings  Prints  Drawings  Samples  Specifications  
 Copy of Letter  Change Order  \_\_\_\_\_

Copies	Date	No.	Description

- These are transmitted as checked below:
- For Approval  Approved as Submitted  Resubmit \_\_\_\_\_ Copies for Approval  
 For Your Use  Approved as Noted  Submit \_\_\_\_\_ Copies for Distribution  
 As Requested  Returned for Corrections  Return \_\_\_\_\_ Corrected Prints  
 For Review and Comment  \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

By: \_\_\_\_\_

- Distribution:  Owner  
 Contractor  
 Construction Manager  
 Design Professional  
 Consultant  
 Other

## SECTION 01340 - SUBMITTALS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This section provides for the submittals required by the City prior to and for the duration of the Work.
- B. All submittals shall be clearly identified by reference to a specification section and/or detail drawing if applicable. Submittals shall be clear and legible and shall include sufficient presentation of the data.
- C. No portion of the Work requiring a shop drawing, product data, or sample shall be started nor shall any materials be fabricated or installed prior to the approval of such items. Fabrication performed, materials purchased, or on-site construction accomplished which does not conform to approved shop drawings and product data shall be at the Contractor's risk. The City shall not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- D. Related Works Specified Elsewhere:
  - 1. Section 00700 – General Conditions:
    - a. Article 2, paragraph 2.06.B.1 – Preliminary Project Schedule.
    - b. Article 2, paragraph 2.06.B.2 – Preliminary Schedule of Shop Drawings and Sample Submittals.
    - c. Article 2, paragraph 2.06.B.3 – Preliminary Schedule of Values.
    - d. Article 6, paragraph 6.04 – Progress Schedule.
    - e. Article 6, paragraph 6.05 – Recovery Schedule.
    - f. Article 6, paragraph 6.06 – Substitute and “Or-Equal” Items.
    - g. Article 6, paragraph 6.18 – Shop Drawings and Samples.
  - 2. Section 01015 – Specific Project Requirements.
  - 3. Section 01320 – Construction Progress Documentation.

#### 1.02 GENERAL INFORMATION

- A. Definitions:
  - 1. Shop Drawings, product data, and Samples are technical Submittals prepared by Contractor, Subcontractor, manufacturer, or Supplier and submitted by Contractor to Owner as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each Division of the Specifications.
    - a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
    - b. Product data includes standard printed information on materials, products, and systems; not custom-prepared for this Project, other than the designation of selections from available choices.
    - c. Samples include both fabricated and physical examples of materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
  - 2. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or Samples.
    - a. Technical reports include laboratory reports, tests, technical procedures, technical records, and Contractor's design analysis.

SECTION 01340 – SUBMITTALS: continued

- b. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, Bonds, Project photographs, physical work records, statements of applicability, copies of industry standards, Project record data, schedules, security/protection/safety data, and similar type Submittals.
  - c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
- B. Quality Requirements:
- 1. Contractor shall submit Shop Drawings and Samples in accordance Section 00700, paragraph 6.18.C Submittal Procedures.
  - 2. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings shall be useable for further reproduction to yield legible hard copy.
  - 3. Documents submitted to City that do not conform to specified requirements shall be subject to rejection by City, and upon request by City, Contractor shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Contractor's failure to initially satisfy the legibility quality requirements will not relieve Contractor from meeting the required schedule for Submittals.
  - 4. All submittals by subcontractors shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time to prevent delays in delivery of materials.
  - 5. The Contractor shall check all subcontractors' submittals regarding measurements, sizes of metal members, materials, and details to determine and verify that they conform to the intent of the Project Manual. Submittals found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.
  - 6. Certificates of Compliance: Where indicated in these specifications, each submittal shall include a certificate of compliance prepared by the manufacturer or Supplier of the submitted data, certifying that the item covered complies with Contract Documents. The certificate of compliance shall be a separate document and shall include identification of all deviations from the Contract Documents.
- C. Submittal Completeness:
- 1. Contractor shall accept full responsibility for the completeness of each submittal. When an item consists of components from several sources, Contractor shall submit a complete initial submittal including all components.
  - 2. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable City to review the information effectively.
  - 3. Where standard drawings are furnished which cover several variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing.
  - 4. Reproductions or copies of Contract Documents or portions thereof will not be accepted as complete fabrication or erection drawings. Contractor may use a reproduction of Contract Documents for erection drawings to indicate information on erection or to identify detail drawing references. Whenever the Drawings are revised to show this

SECTION 01340 – SUBMITTALS: continued

additional Contractor information, Design Professional's title block shall be replaced with Contractor's title block, and Design Professional's professional seal shall be removed from the drawing. Contractor shall revise these erection drawings for subsequent Design Professional revisions to the Contract Documents.

D. Form of Submittals:

1. Submittals and other Project documents shall be transmitted in electronic format as specified.
2. Electronic Format
  - a. Transmit Submittals and Project documents in:
    - (1) Nonproprietary, native electronic format incorporating any necessary reference files, or
    - (2) Adobe \*PDF files created directly from native electronic format, or City-approved equal.
    - (3) Electronic submittal PDF files are not to be combined files or collections of files/drawings. Each drawing document must stand alone.
    - (4) Each file will be right reading and orientation the same for all consecutive resubmissions.
    - (5) For any given Submittal, the filename and format shall be consistent for initial submission and subsequent revisions of the same. Use consistent naming convention throughout. Reference to revision or dates shall not be included in a filename.
    - (6) Nonconforming Submittals are subject to rejection by Engineer.
  - b. Provide Project Record Documents, equipment instruction books and operating manuals, and other documents on CD-ROM or USB thumb drive in AutoCAD and Adobe \*PDF format as required and approved by City.
  - c. Equipment instruction books and operating and maintenance manuals shall be in Adobe \*PDF format combined in one pdf file for the complete operation and maintenance manual or divided into pdf files that represent entire volumes (corresponding to hardcopy volumes). The pdf files shall be completely bookmarked with links within the index sheet to the different sections within the manuals/volumes, corresponding to the defined tabs within the hardcopy version.
3. Hard Copy Submittals:
  - a. Selected Submittals may be provided in paper ("hardcopy") copies only with advance approval of City, and using procedures specified herein.
  - b. Equipment instruction books and operating manuals shall be provided in hardcopies in addition to specified electronic format.
  - c. See Section 01015 for a list of Submittals that are to be submitted in hard copy format.

E. Transmittal of Submittals

1. All submittals, regardless of origin, shall be stamped with the approval of Contractor and identified with the name and number of this Contract, Contractor's name, references to applicable specification paragraphs and Contract Documents and version of the submittal. Each submittal shall indicate the intended use of the item in the Work. When catalog pages are submitted, applicable items shall be clearly identified, and inapplicable data crossed out. The current revision, issue number, and date shall be indicated on all drawings and other descriptive data. Contractor's stamp of approval is a representation to City that Contractor accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar

SECTION 01340 – SUBMITTALS: continued

- data, and that Contractor has reviewed and coordinated each submittal with the requirements of the Work and the Contract Documents.
2. Electronic Submittals: The Contractor shall utilize the City's document management system as specified in Section 01320 for managing, tracking, and storing documents associated with the Project. If an internet-based document management system is to be used, additional requirements are provided in Section 01320 and Section 01015. The Contractor shall comply with the file protocols and procedures for the document management system.
  3. Hard Copy Submittals: Hard copy submittals shall be delivered in accordance with Section 01015.
- F. Submittals Required for the Preconstruction Conference
1. Following are the items requiring submittals by the Contractor at the pre-construction conference:
    - a. General Requirements.
    - b. Preliminary Project Schedule.
    - c. Preliminary Schedule of Shop Drawings and Sample Submittals.
    - d. Preliminary Schedule of Values.
    - e. Listing of Subcontractors.
    - f. Project Sign Request.
    - g. Project letters to be used during the Work.
    - h. Safety Representative.
  2. Project Specific Requirements can be found in Section 01015.

1.03 SHOP DRAWINGS AND SAMPLES

- A. Shop Drawings:
1. Shop Drawings and engineering data covering all equipment and fabricated and building materials which will become a permanent part of the Work under this Contract shall be submitted to City for review as specified herein. The data shall include drawings, descriptive information, and sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.
  2. All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in Contractor's letter of transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by Contractor (including modifications to other facilities that may be a result of the deviation) and all required piping and wiring diagrams.
- B. Product Data:
1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Work.

SECTION 01340 – SUBMITTALS: continued

2. If applicable, submittals for equipment shall include a listing of all installations where identical or similar equipment has been installed and been in operations for a period of at least one year.
  3. Certificates are statements printed on the manufacturer's or supplier's letterhead and signed by responsible officials of manufacturer of product, system, or material. Certifications shall provide a clear statement that the product, system, or material meets the specified requirements of Contract Documents. All certificates shall be dated after the Effective Date of the contract and shall clearly indicate the project name and project number.
- C. Samples:
1. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Design Professional or City for independent inspection and testing, as applicable to the Work.
- D. Instruction Books and Operating and Manuals:
1. Contractor shall submit all Operation and Maintenance Data and Manuals in Adobe \*PDF Format. Transmit documents in Adobe \*PDF files created directly from native electronic format, or scanned from high quality original document. Scanned Adobe \*PDF documents shall be of quality nearly equal native format produced Adobe \*PDF and shall at a minimum meet the following:
    - a. File resolution size shall be between 300 and 600 dots per inch.
    - b. Pages shall be rotated for viewing in proper orientation, and bookmark provided for each entry in the Table of Contents.
    - c. Digital delivery shall be provided on thumb drives or City approved method.
  2. The Requirements of this Section shall also apply to the submittal and review of Operation and Maintenance Data and Manuals.
  3. In addition to electronic Submittals specified, Equipment instruction books and operating manuals prepared by the manufacturer shall include the following:
    - a. Index and tabs.
    - b. Instructions for installation, start-up, operation, inspection, maintenance, parts lists and recommended spare parts, and data sheets showing model numbers.
    - c. Applicable drawings.
    - d. Warranties and guarantees.
    - e. Address of nearest manufacturer-authorized service facility.
    - f. All additional data specified.
    - g. Equipment Description and Data Sheets
      - (1) Example equipment description and data sheets are included at the end of this Section.
      - (2) Equipment description and data sheet shall be completed by Contractor and shall be included in each pertinent section of each manual for all items as generally indicated.
  4. Information listed above shall be bound into front, back, and spine sheet-insert style hard-back binders of three-ring type. Sheet size shall be 8-1/2 x 11. Binder color shall be black or white. Capacity shall be a minimum of 1-1/2 inches, but sufficient to contain and use sheets with ease. Provide the following accessories:
    - a. Label holder.
    - b. Business card holder.

SECTION 01340 – SUBMITTALS: continued

- c. Sheet lifters.
  - d. Horizontal pockets.
  5. The following information shall be inserted in the binder front clear cover:
    - a. City's Name and Department name.
    - b. City's facility or plant name.
    - c. Equipment item name.
    - d. Volume number (if applicable).
    - e. Contract number.
    - f. Manufacturer's name and address.
  6. The following information shall be inserted by label in the binder spine:
    - a. Equipment item name.
    - b. City's Name and Department
    - c. City's facility or plant name.
    - d. Manufacturer's name.
    - e. Contract number.
    - f. Volume number (if applicable).
  7. Submit mockup of cover and spine for Engineer's review.
- E. Survey Data:
1. All field books, notes, videotapes, and other data developed by Contractor in performing surveys required as part of the Work shall be available to City for examination throughout the construction period.
  2. All such data shall be submitted to City with the other documentation required for final acceptance of the Work.

1.04 CITY'S REVIEW OF DRAWINGS AND DATA

- A. City's review of drawings and data submitted by Contractor will cover only general conformity to the Drawings and Specifications, external connections, and dimensions which affect the layout. City's review does not indicate a thorough review of all dimensions, quantities, and details of the material, equipment, device, or item shown. City's review shall not relieve Contractor of Contractor's responsibility for errors, omissions, or deviations in the drawings and data, nor of sole responsibility for compliance with the Contract Documents.
- B. City's submittal review period shall be 21 consecutive calendar days in length and shall commence on the first calendar day immediately following the date of arrival of the submittal or resubmittal in City's office. The time required to mail the submittal or resubmittal back to Contractor shall not be considered a part of the submittal review period. Submittals shall be returned to the Contractor under one of the following mark ups:
  1. "APPROVED" is assigned when there are no notations or comments on the submittal. When returned, the Contractor may release the equipment and/or material for manufacture.
  2. "EXCEPTIONS NOTED" is assigned when a confirmation of the notations and comments is not required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
  3. "RETURNED FOR CORRECTION" is assigned when the submittal does not meet the intent of the Construction Contract Documents. The Contractor must resubmit the document revised to bring the submittal into conformance. "RETURNED FOR CORRECTION" is also assigned when notations and comments are extensive enough to require a resubmittal of the package.

SECTION 01340 – SUBMITTALS: continued

4. “NOT ACCEPTABLE” is assigned when the submittal does not meet the intent of the Construction Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Construction Contract Documents. “NOT ACCEPTABLE” is also assigned when the notations and comments are extensive enough to require a resubmittal of the package.
  5. “PRELIMINARY SUBMITTAL” is assigned when submittal is of preliminary nature that a determination of conformance with the design concept or compliance with the intent of the Contract Documents must be deferred until additional information is furnished. Contractor is to submit such additional information to permit layout and related activities to proceed.
  6. “FOR REFERENCE, NO APPROVAL REQUIRED” signifies that the submittal is for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, bulletins and similar data, all of which are useful to City in design, operation, or maintenance, but which by their nature does not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract Documents. City reviews such Submittals for general content but not for basic details.
- C. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the City at least seven working days prior to release for manufacture.
- D. Resubmittal of Drawings and Data:
1. Contractor shall accept full responsibility for the completeness of each resubmittal. Contractor shall verify that all corrected data and additional information previously requested by City are provided on the resubmittal. When corrected copies are resubmitted, Contractor shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by City on previous submissions.
  2. Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal.
  3. Resubmittals shall be made within thirty (30) days of the date of the letter returning the material to be modified or corrected, unless within 14 days Contractor submits an acceptable request for an extension of the stipulated period, listing the reasons the resubmittal cannot be completed within that time.
  4. Any need for more than one resubmission, or any other delay in obtaining City’s review of submittals, will not entitle Contractor to extension of the Contract Times unless delay of the Work is directly caused by a change in the Work authorized by a Change Order or by failure of City to review any submittal within the submittal review period specified herein and to return the submittal to Contractor.
  5. Engineer will record all labor and expenses required to review Submittals that are submitted more than one time prior to final acceptance. Contractor shall reimburse Owner for all labor and expenses required for review of all subsequent Submittals.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

SECTION 01340 – SUBMITTALS: continued

END OF SECTION 01340

## SECTION 01400 – QUALITY CONTROL

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes requirements of a general nature related to the Contractor's responsibility for quality control involving inspections, tests, certifications, and reports. This Section includes the following:
  - 1. Inspections.
  - 2. Quality Assurance – Control of Installation.
  - 3. References.
  - 4. Inspecting and Physical Testing Laboratory Services.
  - 5. Contractor's responsibilities.
  - 6. Reports.
  - 7. Equipment Calibration.
- B. Unless otherwise indicated on the Attachments or Specifications, only new materials shall be incorporated in the Work. All materials furnished by the Contractor to be incorporated in the Work shall be subject to the inspection and approval of the Owner and the Engineer. No material shall be processed for, or delivered to the Work without prior approval by the Engineer.
- C. Related Work Specified Elsewhere:
  - 1. Section 01340 – Submittals.

#### 1.02 INSPECTIONS

- A. The Engineer and the Owner shall have the right to inspect all material and equipment at all stages of collection and processing, and shall be allowed access to the site and to the Contractor's and supplier's facilities to conduct such inspections. Onsite work shall be subject to continuous inspection. Inspection by the Engineer or the Owner shall not release the Contractor from responsibility or liability with respect to material. The Engineer or the Owner will supply the Contractor a minimum of 24 hours' notice prior to unscheduled offsite inspections.
- B. When local codes or laws require approval and inspection of the work by other agencies or organizations such as for UST regulations after cleaning, the Contractor shall obtain such approval and submit one signed original and three copies of the approval to the Owner.

#### 1.03 QUALITY ASSURANCE – CONTROL OF INSTALLATION

- A. The Contractor shall monitor quality control over suppliers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. The Contractor shall comply with manufacturers' instructions, including each step in sequence.
- C. The Contractor shall examine the areas and conditions where Work is to be performed and notify the Owner of conditions detrimental to the proper and timely completion of the Work. The Contractor shall not proceed with the Work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Owner.
- D. The Contractor shall request clarification from Engineer should manufacturers' instructions conflict with Contract Documents. The clarification shall be received prior to proceeding.
- E. The Contractor shall comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- F. Work shall be performed by persons qualified to produce workmanship of specified quality.

SECTION 01400 – QUALITY CONTROL: continued

1.04 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, the Contractor shall comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The Contractor shall be familiar with applicable standards. Copies of these standards shall be obtained by the Contractor where required by product specification sections.
- C. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Engineer shall not be altered from the Contract Documents by mention or influence otherwise in any reference document.

1.05 INSPECTING AND PHYSICAL TESTING LABORATORY SERVICES

- A. The Contractor shall contract with an independent Subcontractor, upon review and acceptance by the Owner and the Engineer, to perform laboratory testing as required by these Specifications and as required by the Owner.
- B. The independent testing firm(s) shall have performed previous similar work in a satisfactory manner, be an approved subcontractor, and specialize in the types of inspections and tests to be performed. Testing firm(s) shall be authorized by authorities having jurisdiction to operate in the State of Missouri. The Contractor shall include the costs of this service in his bid.
- C. The Contractor shall provide labor and materials and necessary testing facilities at the site as required by Specifications and the independent laboratories. The Contractor shall cooperate with the Owner and the Engineer and the independent laboratory and shall provide the testing firm with at least 24 hours notice prior to specified testing.
- D. The Contractor shall be solely responsible for the adequate stability of cut soil slopes at the site and for providing a safe working condition within excavated areas.
- E. Inspecting, testing, and source quality control may occur on or off the project site. Offsite inspecting or testing shall be performed as required by the Engineer or the Owner.
- F. The Contractor shall be responsible for scheduling and coordinating inspections, tests, and similar activities with minimum delay to project.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall provide incidental labor and facilities:
  - 1. To provide access to Work to be tested.
  - 2. To obtain and handle samples at the site.
  - 3. To facilitate tests and inspections.
  - 4. To provide storage of test samples.
- B. The Engineer and Owner shall be notified 48 hours prior to expected time for operations requiring services.
- C. The Contractor shall make arrangements with the Engineer and pay for additional samples and tests required for Contractor's use.
- D. Testing or inspecting does not relieve Contractor to perform Work to contract requirements.
- E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm at the Contractor's expense.

1.07 REPORTS

- A. Transcripts or certified test reports including all test results shall be submitted for review to the Engineer. Acceptance by the Engineer shall be received prior to delivery of material. The testing shall have been performed by an approved independent testing facility within the previous six months of submittal of the reports for review. Transcripts of test results shall be accompanied by a certificate in the form of a letter from the manufacturer or supplier certifying

SECTION 01400 – QUALITY CONTROL: continued

- that the tested material meets the specified requirements and is of the same type, quality, manufacturer, and make as that specified.
- B. The Contractor may, in lieu of the specified tests and at the option of the Engineer, submit for review a notarized Certificate of Compliance in the form of a letter from the manufacturer. The Certificate shall state the following:
1. Manufacturer has performed all required tests.
  2. Materials supplied meet all test requirements.
  3. Tests were performed within six months of submittal of the Certificate.
  4. Materials that were tested are the same type, quality, manufacture, and make as those specified.
  5. Include identification of the materials.
- C. The independent testing firm shall submit a certified written report, in triplicate, of each inspection and test to the Contractor. One copy of these results will be provided to the Engineer on the same day as the testing is performed.
1. Submit additional copies of each report to the governing authority, when the authority so directs.
  2. Report Data: Reports of each inspection, test, or similar service include, but are not limited to, the following:
    - a. Date of issue.
    - b. Project title and number.
    - c. Name, address, and telephone number of testing agency.
    - d. Dates and locations of samples and tests or inspections.
    - e. Names of individuals making the inspections or test.
    - f. Designation of the Work and test method.
    - g. Identification of product and Specification Section.
    - h. Complete inspection of test data.
    - i. Test results and an interpretation of test results.
    - j. Ambient conditions at the time of sample taking and testing.
    - k. Comments or professional opinion on whether inspected or tested Work complies with requirements.
      - l. Name and signature of laboratory inspector.
      - m. Recommendations on retesting.

1.08 EQUIPMENT CALIBRATION

- A. All field test equipment will be kept under control of the Contractor's testing Subcontractor. The testing Subcontractor will be fully trained in the use of equipment, test procedures, and interpretations of results for each piece of test equipment. A copy of calibration certification will be kept by the testing Subcontractor and supplied to the Engineer.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01400

## SECTION 01520 – TEMPORARY FACILITIES

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes requirements for temporary field offices and other structures required for office, storage space for Contractor and Engineer, and includes controls over Contractor operation required for this project.
- B. Operate and maintain temporary facilities for the duration of the project and as directed by the Engineer. All cost and use charges for temporary facilities shall be included in the Contract Price.
- C. Existing facilities at the Site shall not be used for field offices.
- D. Related Work Specified Elsewhere:
  - 1. 00410.03 List of Equipment and Staffing.
  - 2. 01015 Specific Project Requirements.

#### 1.02 CODES AND STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. National Fire Protection Association:
  - 1. NFPA 10 - Standard for Portable Fire Extinguishers.
  - 2. NFPA 70 - National Electric Code.
  - 3. NFPA 241 - Standard for Safeguarding Construction, Alternation, and Demolition Operations.

#### 1.03 PROVIDED BY THE CITY

- A. The city will furnish without charge all necessary water for filling, flushing, disinfection, and testing the completed yard piping, process piping, water tower, and other construction requirements; however, should testing of an item of Work fail then the Contractor shall pay the cost at current retail rates for additional water required for retesting and/or re-disinfection of the Work.
- B. The city will provide a backflow preventer and a meter for connections to existing water mains.

#### 1.04 SUBMITTALS

- A. Submit shop drawings and product data, in accordance with Section 01340 Submittals, showing materials of construction and details of installation for:
  - 1. Site Plan: Show the proposed locations for temporary facilities including offices, temporary utilities, storage containers/buildings, vehicle access and parking areas, material laydown and staging areas, and other security measures.
  - 2. Engineer's Field Office: Dimensioned floor plan, office systems, furnishings, and equipment.
- B. Submittals shall be received by the Engineer no later than the date of the Preconstruction Meeting.

### PART 2 - PRODUCTS

#### 2.01 FIELD OFFICES

- A. General:
  - 1. Provide trailers, mobile buildings, or buildings constructed with floors raised aboveground, with steps, landings, and railings at the entrance doors.
  - 2. Buildings shall be structurally sound, secure, and weathertight.

SECTION 01520 – TEMPORARY FACILITIES: continued

3. Provide appropriate type fire extinguishers at each office and storage area.
  4. Maintain offices during the progress of the Work.
  5. Install office spaces ready for occupancy 15 days after date stated in Notice to Proceed.
- B. Contractor's Office:
1. Provide a field office for Contractor's superintendent on the Site.
  2. It shall be of size required for general use, with lights, heat, furnishings, telephone service, and other necessary facilities and utilities required by Contractor's operations.
  3. The requirement for this field office will not be waived.
- 2.02 STORAGE SHEDS AND TRAILERS:
- A. On Site:
1. Provide temporary buildings or trailers needed for storage of Equipment and Materials installed under this Contract.
  2. Provide ventilation and heating as required by Equipment and Material stored.
- B. Off Site:
1. Advise Engineer of any arrangements made for storage of Equipment and materials in a place other than Owner's Site. Furnish evidence of insurance coverage with Application for Payment as specified by the Contract Documents.

PART 3 - EXECUTION

- 3.01 OFFICE
- A. Stationary Office: If required in Section 01015, Contractor shall maintain a suitable stationary office at or near the Site during the performance of the Work
  - B. The Office shall serve as the headquarters of the Contractor's representative authorized to receive Contract Documents, instructions, other communication, or articles associated with the Work
  - C. Any communication given to the said representative or delivered at Contractor's office at the site of the Work in his absence shall be deemed to have been delivered to Contractor.
  - D. Copies of the Contract Documents shall be kept at the Office and shall be available for use always.
- 3.02 FIELD OFFICE FOR RESIDENT PROJECT REPRESENTATIVE
- A. The Contractor shall provide a field office for the Resident Project Representative.
  - B. See Section 01015 – Specific Project Requirements regarding the requirement of the Contractor to provide a field office for the Resident Project Representative.
- 3.03 LOCATION, INSTALLATION AND MAINTENANCE
- A. Place temporary buildings, trailers, and stored materials in locations acceptable to Owner or Engineer.
  - B. Install field offices and sheds to resist winds and elements of the locality where installed.
  - C. Remove when no longer needed at the Site or when Work is completed.
  - D. At completion of Work, remove temporary buildings and trailers, foundations (if any), utility services, and debris.
  - E. Prepare ground or paved areas as specified in applicable Sections.

SECTION 01520 – TEMPORARY FACILITIES: continued

3.04 WATER

- A. The City will furnish without charge all necessary water for Work (i.e., filling, flushing, disinfection, and testing completed water lines and other construction requirements.) The Contractor shall make arrangements with the City for all water used.
- B. Use of City's water facilities shall be at the direction of Water Services Department so that water service to customers served by the facilities is not impaired under any conditions, water shall not be wasted.
- C. Any water furnished by the City must be obtained from the City's existing main.
- D. The Contractor shall use the Reduced Pressure Zone (R.P.Z.) Backflow Preventer when connected to the City's water system.
- E. All costs for labor, materials, equipment, and services needed to obtain water for construction purposes shall be included in the Bid. No separate measurement and payment will be made to make connections.

3.05 OPERATION OF EXISTING VALVES

- A. The Contractor shall not operate any valves on the City's system without direct supervision from a Water Services Department Representative.
- B. If the Contractor desires the operation of any valves, he shall make a request at least twenty-four (24) hours in advance to the Water Services Department for such operation, also giving a forty-eight (48) hours in advance notice to any affected property.
- C. The hydrant branch valves may be operated in the presence of a representative of the Water Services Department with no official advance notification.
- D. All fire hydrant and water control valves shall be kept free from obstruction and available for use at all times.

3.06 TEMPORARY UTILITIES

- A. Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.
- B. Power:
  - 1. All power for lighting, operations of the Contractor's equipment, or for any other use which may be required for proper completion of the Work shall be provided by the Contractor.
  - 2. Temporary heat and lighting shall be maintained until the Work is accepted.
- C. Cellphone service:
  - 1. Contractor shall make all necessary arrangements and pay all cell phone charges in their office at the site to ensure consistent and uninterrupted coverage for their use.
- D. Sanitary Facilities:
  - 1. Contractor shall furnish temporary sanitary facilities at the site, as provided herein, for the needs of all construction workers and others performing work or furnishing services on the Project.
  - 2. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet will be furnished for each 20 persons. Contractor shall enforce the use of such sanitary facilities by all personnel at the site.
  - 3. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the City. The doors shall be self-closing. Locate the facility behind the construction fence or out of the public view.

SECTION 01520 – TEMPORARY FACILITIES: continued

3.07 BARRICADES AND LIGHTS

- A. All streets, roads, highways, and other public thoroughfares which are closed to traffic shall be protected by effective barricades on which shall be placed acceptable warning signs. Barricades shall be located at the nearest intersecting public highway or street on each side of the blocked section.
- B. All open trenches and other excavations shall have suitable barricades, signs, and lights to provide adequate protection to the public. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights.
- C. All barricades and obstructions shall be illuminated with warning lights from sunset to sunrise. Material storage and conduct of the Work on or alongside public streets and highways shall cause the minimum obstruction and inconvenience to the traveling public.
- D. All barricades, signs, lights, and other protective devices shall be installed and maintained in conformity with applicable statutory requirements and, where within railroad and highway rights-of-way, as required by the authority having jurisdiction.

3.08 EXISTING FENCING

- A. All existing fences affected by the Work shall be maintained by Contractor until completion of the Work. Fences which interfere with construction operations shall not be relocated or dismantled until written permission is obtained from the owner of the fence, and the period the fence may be left relocated or dismantled has been agreed upon.
- B. Where fences must be maintained across the construction easement, adequate gates shall be installed. Gates shall be kept closed and locked at all times when not in use.
- C. On completion of the Work across any tract of land, Contractor shall restore all fences to their original or to better condition and to their original location.

3.09 SAFETY FENCING

- A. Provide fencing along the construction site at all open excavations and tunnels to control access by unauthorized people.
- B. The safety fencing must be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 48 inches high and maximum mesh size of 2 inches, supported and tightly secured to steel posts located on maximum 10-foot centers, constructed at the approved location.
- C. Remove the fence from the work site upon completion of the Work.

3.10 PROTECTION OF PUBLIC AND PRIVATE PROPERTY

- A. Contractor shall protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by his construction operations.
- B. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences, and other surface structures affected by construction operations, together with all sod and shrubs in yards, parkways, and medians, shall be restored to their original condition, whether within or outside the easement. All replacements shall be made with new materials.
- C. No trees shall be removed outside of the permanent easement, except as indicated on the Contract Documents and as authorized by City.

3.11 DAMAGE TO EXISTING PROPERTY

- A. Contractor will be held responsible for any damage to existing structures, Work, materials, or equipment because of his operations and shall repair or replace any damaged structures, Work, materials, or equipment to the satisfaction of, and at no additional cost, to City.

SECTION 01520 – TEMPORARY FACILITIES: continued

- B. Contractor shall protect all existing structures and property from damage and shall provide bracing, shoring, or other work necessary for such protection.
- C. Contractor shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or men to or from the Work. Contractor shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

3.12 SECURITY

- A. Contractor shall be responsible for protection of the site, and all Work, materials, equipment, and existing facilities thereon, against vandals and other unauthorized persons.
- B. No claim shall be made against City by reason of any act of an employee or trespasser, and Contractor shall make good all damage to City's property resulting from his failure to provide security measures as specified.

3.13 PARKING

- A. Contractor shall provide and maintain suitable parking areas for the use of all construction workers and others performing work or furnishing services in connection with the Project, as required to avoid any need for parking personal vehicles where they may interfere with public traffic, City's operations, or construction activities.

END OF SECTION 01520

## SECTION 01560 – ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes general requirements for:
  - 1. Environmental controls.
  - 2. Safety and Protection Facilities Installation.
  - 3. Access Roads and Parking Areas.
  - 4. Traffic Control Use and Parking Areas.
  - 5. Barriers.
- B. Related Work Specified Elsewhere:
  - 1. Section 01340 – Submittals.

#### 1.02 INFORMATION PROVIDED BY THE CITY

- A. As provided in the Contract Documents.

#### 1.03 SUBMITTALS

- A. The Contractor shall submit a parking plan in accordance with Section 01340:
  - 1. The parking plan shall identify areas for construction personnel may park vehicles used for commuting to the construction site.
  - 2. Parking plan shall identify locations to park vehicles required for construction activities when not in use.
  - 3. The parking plan shall not prevent access for daily and emergency use by the agencies and utilities having jurisdiction over streets and utilities in the Work area.
  - 4. The parking plan shall provide a Contractor's contact in the event a parked vehicle inhibits access by the agencies and utilities having jurisdiction over streets and utilities in the Work area.
- B. The Contractor shall submit a Site Safety Plan as described in paragraph 3.02.

PART 2 - PRODUCTS - specified in respective Sections, this Division.

### PART 3 - EXECUTION

#### 3.01 ENVIRONMENTAL CONTROLS

- A. Dust Control:
  - 1. Contractor shall take reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by application of a chemical suppressant. When practicable, dusty materials in piles or in transit shall be covered to prevent blowing.
  - 2. Buildings or operating facilities which may be affected adversely by dust shall be adequately protected from dust. Existing or new machinery, motors, instrument panels, or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.
- B. Debris Control and Clean-Up:
  - 1. Keep the premises free at all times from accumulations of debris, waste materials, and rubbish caused by construction operations and employees. Responsibilities shall include:
    - a. Adequate trash receptacles about the Site, emptied promptly when filled.
    - b. Periodic cleanup to avoid hazards or interference with operations at the Site and to maintain the Site in a reasonably neat condition.
    - c. The keeping of construction materials such as forms and scaffolding neatly stacked.

SECTION 01560 – ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS: continued

- d. Immediate cleanup to protect the Work by removing splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from walls, floors, and metal surfaces before surfaces are marred.
- C. Pollution Control:
1. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of hazardous or toxic substances from construction operations.
  2. Provide equipment and personnel, perform emergency measures required to contain any spillages, and remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-site in approved locations and replace with suitable compacted fill and topsoil.
  3. Take special measures to prevent harmful substances from entering public waters, sanitary, or storm sewers.
  4. Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from the construction activities.
  5. No sanitary wastes will be permitted to enter any drain or watercourse other than sanitary sewers.
  6. No sediment, debris, or other substance will be permitted to enter sanitary sewers, and reasonable measures will be taken to prevent such materials from entering any drain or watercourse.
  7. Concrete washout area shall be installed and maintained according to Drawing C006 Detail E. All concrete washout shall be performed at the designated concrete washout area.
- D. Noise Control:
1. Contractor shall take reasonable measures to avoid unnecessary noise. Such measures shall be appropriate for the normal ambient sound levels in the area during working hours. All construction machinery and vehicles shall be equipped with practical sound-muffling devices and operated in a manner to cause the least noise consistent with efficient performance of the Work.

3.02 SAFETY AND PROTECTION OF WORK AND PROPERTY:

- A. General:
1. Contractor shall prepare a Site Safety Plan for their Work on the project and provide copy to Engineer and Owner prior to the beginning of construction activities on the project site. Engineer and Owner will be present on the site during construction and shall be made aware of Contractor's Site Safety Plan measures for the project.
  2. The Contractor shall provide for the safety and protection of the Work and of Materials and Equipment to be incorporated therein, whether in storage on or off the Site. Provide protection at all times against rain, wind, storms, frost, freezing, condensation, or heat so as to maintain all Work and Equipment and Materials free from injury or damage. At the end of each day, all new Work likely to be damaged shall be appropriately protected.
  3. Notify Engineer immediately at any time operations are stopped due to conditions which make it impossible to continue operations safely or to obtain proper results.
  4. Construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations, floors, pits, trenches, manholes, and ducts free of water.
  5. Protect floors from damage by proper covering and care when handling heavy equipment, painting, or handling mortar or other such materials. Use proper cribbing and shoring to prevent overloading of floors while moving heavy equipment. Provide metal pans under

SECTION 01560 – ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS: continued

- pipe-threading machines and clean such pans daily, keeping oil off floors. Restore floors to former condition where damaged or stained.
6. Concrete floors less than 28 days old shall not be loaded without written permission from Engineer.
  7. Restrict access to roofs except as required by the Work. Where access is required, provide protection with plywood, boards, or other suitable materials.
- B. Property Other than Owner's:
1. Provide for the safety and protection of property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction. Report immediately to the owners thereof and promptly repair damage to existing facilities resulting from construction operations.
  2. Names and telephone numbers of representatives of agencies and utilities having jurisdiction over streets and utilities in the Work area are listed below for Contractor's convenience. It is the Contractor's responsibility to verify the agencies and utilities listed below are the correct entities that have the respective jurisdictions within the Construction Limits. Concerned agencies or utilities shall be contacted a minimum of 24 hours prior to performing Work, closing streets and other traffic areas, or excavating near underground utilities or pole lines, unless noted otherwise.
    - a. Water:
      - (1) City of Kansas City, Missouri – Water Services Department.
      - (2) Jackson County Public Water Supply District No. 1 – Public Works Department.
    - b. Sanitary Sewer: City of Kansas City, Missouri – Public Works Department.
    - c. Storm Sewer: City of Kansas City, Missouri – Public Works Department.
    - d. Maintenance Road:
      - (1) City of Kansas City, Missouri – Public Works Department.
      - (2) City of Grandview, Missouri – Public Works Department.
    - e. Gas: Spire Energy.
    - f. Electric: Evergy.
    - g. City Engineer:
      - (1) City of Kansas City, Missouri – David Miller.
      - (2) City of Grandview, Missouri.
    - h. Fire: City of Kansas City, Missouri – Fire Department.
    - i. Police: City of Kansas City, Missouri – Police Department.
  3. Operation of valves or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.
  4. Where fences are to be breached on private property, the owners thereof shall be contacted, and arrangements made to ensure proper protection of any livestock or other property thus exposed.
  5. The applicable requirements specified for protection of the Work shall also apply to the protection of existing property of others.
  6. Before acceptance of the Work by Owner, restore all property affected by Contractor's operations to the original or better condition.
- C. Security and Protection Facilities Installation:
1. Notify Water Services Department and Engineer:
    - a. Daily initial entry and final departure from Work Site.
    - b. Any departure and re-entry of all personnel from the site during the workday.
  2. Lock entrances at end of each workday.

SECTION 01560 – ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS: continued

3. Lock entrances during the workday when all personnel depart the site.

3.03 ACCESS ROADS AND PARKING AREAS:

A. Existing On-Site Roads and Parking Areas:

1. Designated existing on-Site streets and parking facilities may be used for construction traffic. The Contractor shall:
  - a. Submit plan identifying locations for daily parking.
  - b. Provide temporary additional roads as needed for required construction access within defined limits of construction.
  - c. Maintain existing construction, and restore to original, better, or specified condition at completion of Work.
  - d. The Owner's existing parking areas are limited, but designated areas may be used for construction personnel.

3.04 TRAFFIC CONTROL AND USE OF ROADWAYS:

A. Traffic Control:

1. Comply with requirements of authorities having jurisdiction.
2. The agencies and utilities having jurisdiction over streets and utilities in the Work area.
3. Maintain access for fire-fighting equipment and access to fire hydrants.
4. Provide, operate, and maintain equipment, services, and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow on haul routes, at Site entrances, on-Site access roads, and parking areas. This includes traffic signals and signs, flagmen, flares, lights, barricades, and other devices or personnel as necessary to adequately protect the public.
5. Remove temporary equipment and facilities when no longer required. Restore grounds to original, better, or specified condition when no longer required.
6. Provide and maintain suitable detours or other temporary expedients if necessary.
7. Bridge over open trenches where necessary to maintain traffic.
8. Consult with governing authorities to establish public thoroughfares which will be used as haul routes and Site access. All operations shall meet the approval of owners or agencies having jurisdiction.

B. Maintenance of Roadways:

1. Repair roads, walkways, and other traffic areas damaged by operations. Keep traffic areas as free as possible of excavated materials and maintain in a manner to eliminate dust, mud, and hazardous conditions.
2. All operations and repairs shall meet the approval of owners or agencies having jurisdiction.

3.05 BARRIERS

A. General:

1. Furnish, install, and maintain suitable barriers as required to prevent public entry, to protect the public, and to protect the Work, existing facilities, trees, and plants from construction operations. Remove when no longer needed or at completion of Work.
2. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards or regulatory agencies.
3. Barriers shall be of a neat and reasonable uniform appearance, structurally adequate for the required purposes.
4. Maintain barriers in good repair and clean condition for adequate visibility. Relocate barriers as required by progress of Work.

SECTION 01560 – ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS: continued

5. Repair damage caused by installation and restore area to original or better condition. Clean the area.
- B. Fences:
1. Temporary fencing is not required for the project. Contractor shall protect existing access road security gate and is responsible for immediately replacing any damaged sections of existing security gate that may occur during the Contract Time at no expense to the Owner.
- C. Tree and Plant Protection:
1. Preserve and protect all existing trees and plants on Site unless noted otherwise on the drawings. The roots shall be removed for any trees marked and noted to be removed on the drawings
  2. Provide temporary barriers around each, or around each group of trees and plants. Construct to a height of six feet around trees, and to five feet from trunk to adequately protect plants.
  3. Protect root zones of trees and plants as follows:
    - a. Do not allow vehicular traffic or parking.
    - b. Do not store materials or products.
    - c. Prevent dumping of refuse or chemically injurious materials or liquids.
    - d. Prevent puddling or continuous running water.
  4. Carefully supervise excavating, grading, and filling, and subsequent construction operations to prevent damage.

END OF SECTION 01560

## SECTION 01570 – TEMPORARY EROSION AND SEDIMENT CONTROL

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes project requirements for temporary erosion and sediment control.
- B. Related Work Specified Elsewhere:
  - 1. Section 01015 – Specific Work Requirements.
  - 2. Section 01340 – Submittals.
  - 3. Section 31 20 50 – Site Preparation and Earthwork.
  - 4. Section 32 16 00 – Surface Restoration.
  - 5. Section 32 92 00 – Seeding.

#### 1.02 REFERENCES

- A. American Public Works Association – Kansas City Metropolitan Chapter (APWA):
  - 1. APWA Division V Section 5100 - Erosion and Sediment Control (APWA-KCMO 5100).

#### 1.03 DESCRIPTION

- A. The Contractor shall provide erosion and sediment control measures for all areas within and adjacent to the Project site. The Contractor shall assume that the work is to be done under the City's General Operating Permit (Permit No: MOR100006). The Contractor does not need to make separate application to the Missouri Department of Natural Resources (MDNR).
- B. Specific erosion and sediment control measures are specified in APWA 5100 and Standard Erosion and Sediment Control (ESC) Drawings These measures shall be implemented in order to control erosion and water pollution.
- C. No separate payment shall be made for Erosion and Sediment Control. The Contractor shall include in the lump sum total bid price all labor, material and equipment necessary to comply with the Section and all other Work indicated in the Contract Documents.
- D. The Contractor shall install and maintain temporary erosion and sediment control devices prior to commencing construction operations and continue through the construction period until such time as seeding and sodding has been completed and turf is established on all graded areas.
- E. The Contractor shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) utilizing the latest version of the City's SWPPP template to develop the plan. The plan must include a narrative of the types and appropriate uses of Best Management Practices (BMPs) for erosion and sediment control and stormwater management. The requirements of the SWPPP must be as stringent as those described in the City's General Operating Permit (No: MOR100006) and 10 CSR 20-6.200. Additionally, the SWPPP must comply with the City of Kansas City's MS4 permit.
- F. Failure to control erosion and water pollution will result in the Contractor being noncompliant. Any noncompliance constitutes grounds for the following enforcement actions. The Contractor shall have 24 hours after receiving a notice of noncompliance from the City's representative (i.e. Project Manager, Design Professional, Inspector/Representative of the City) to correct the problem. If weather conditions prevent the correction of BMPs within 7 calendar days, the reasons for the delay must be documented (including pictures) and there must be a narrative explaining why the work cannot be accomplished within the 7 day time period. The documentation must be filed with the regular inspection reports. The Contractor shall correct the problem as soon as weather conditions allow. If the Contractor fails to correct the problem after the time prescribed, the City will hire a remediation expert to fix the problem. In such an event, the Contractor shall be liable to the City for the remediation costs plus a 10 percent mark-up of the total contract price. If the Contractor continues to be noncompliant the Director (or an authorized agent thereof) may issue a stop work order and delay any payment until control measures are properly functioning and any damage has been mitigated. In such an

SECTION 01570 – TEMPORARY EROSION AND SEDIMENT CONTROL: continued

event, any delay to the Project schedule will result in liquidated damages assessed against the Contractor.

1.04 SPECIFICATION MODIFICATION

- A. It is understood that throughout this section, these Specifications may be modified by appropriate items in Section 01015 or as otherwise indicated on the Contract Drawings.

1.05 QUALITY INSURANCE

- A. The Contractor is responsible for the quality assurance and quality control of the Work. The Work shall be performed by a contractor with a proven record of performance for similar erosion and sedimentation control work.

1.06 INFORMATION PROVIDED BY THE CITY

- A. As provided in the Contract Documents.

1.07 SUBMITTALS

- A. The Contractor shall submit to the City/Design Professional for review and approval, in accordance with Section 01340, all specifications and data covering the proposed materials to be used for erosion and sedimentation control work.
- B. The Contractor shall submit the following to the City/Design Professional for review and approval prior to the preconstruction conference:
  - 1. The Contractor shall prepare and submit a SWPPP.
  - 2. The SWPPP shall meet the requirements of this Section, applicable references on the plans, the City's adopted Erosion and Sediment Control Specifications (ESCS), and the APWA-KCMO 5100. The Contractor shall develop, implement, and adhere to the erosion control and stormwater pollution prevention plan based upon the City's guidelines and requirements.
  - 3. Submittals shall be received by the Engineer no later than the date of the Preconstruction Meeting.
  - 4. No work can begin until the SWPPP is approved by the City/Design Professional.
  - 5. The Contractor shall update and maintain the SWPPP as necessary to develop ongoing site-specific control measures until final acceptance of the Project.

PART 2 - PRODUCTS - specified in respective Sections, this Division.

PART 3 - EXECUTION

3.01 SAFETY

- A. Perform all work in accordance with applicable Occupational Safety and Health Administration (OSHA) standards.

3.02 PERFORMANCE:

- 1. City Projects are covered by a general NPDES permit maintained by the Water Services Department's Storm Water Division. The Permit imposes a number of obligations including but not limited to, the following:
  - a. Project must be reported to Missouri Department of Natural Resources (MDNR) 90 days before the Project starts.
  - b. Each site must have and follow a writing SWPPP. Each site must be inspected weekly and following each rain event, for compliance with the SWPPP. Written inspection reports must be kept.

SECTION 01570 – TEMPORARY EROSION AND SEDIMENT CONTROL: continued

- c. All personnel on site must be briefed on the requirements of the SWPPP.
  - d. A copy of the SWPPP must be on site at all times.
  - e. All deficient items shall be promptly corrected. In no case shall the correction period exceed two calendar days.
  - f. Quarterly reports must be filed by the City with MDNR identifying and giving the status and percent complete of each Project.
  - g. MDNR must be notified if hazardous substances or contaminated soil are discovered on site.
2. The Contractor shall follow the approved SWPPP, as well as all erosion control measures included in the Contract Documents and implement other BMP measures as directed by the City/Design Professional.
  3. Contractor shall prevent erosion during his operations until vegetation is re-established. The Contractor shall prepare erosion control plans and submit in writing to the City/Design Professional any proposed modifications to the plans. The proposed modifications shall describe materials that will be used and the tasks that will be performed to control runoff the site.
  4. Erosion control devices shall be in place before land is disturbed.
  5. All earthen structures shall be seeded according to Section 32 92 00.
  6. Vegetation shall be established to provide adequate protection or develop other suitable means.
  7. Sediment trapping devices shall be installed in the proper location prior to any grading.
  8. The Contractor shall establish sediment trapping devices that functions properly.
  9. The Contractor shall prevent sediment from leaving the site and/or from damaging adjacent property.
  10. The Contractor shall prevent and or remove mud on public roads or at intersections with public roads that is related to the Project work being completed.
  11. The Contractor shall provide a temporary construction entrance to reduce/eliminate transport of mud from the construction site onto public right of way.
  12. Contractor shall provide dust control measures for any graveled areas or exposed soil areas. See this Section Paragraph 3.03A Dust Control for additional requirements.
  13. Contractor shall temporarily or permanently stabilize all areas with exposed soil. See Section 32 92 00.
  14. The Contractor shall adequately stabilize all finished cut and fill slopes.
  15. All on-site drainage channels and outlets shall be adequately stabilized.

3.03 INSTALLATION:

1. Methods, materials and maintenance shall be the sole responsibility of the Contractor. The Contractor and the City/Design Professional shall conduct weekly onsite inspections using the “Erosion and Sediment Control Checklist” provided by the Water Services Department. Remove any onsite pollutant sources (debris piles with petroleum cans, chemical containers, fueling trucks/tanks or other possible sources of pollution). Upon notification of a weather forecast with a reasonable likelihood of rain, or at the direction of the City/Design Professional, the Contractor shall construct temporary berms and install erosion control fencing as necessary to control the potential eroded sediment and prevent it from leaving the construction area. If the Contractor’s construction operations are complete to the point where seeding is the major item at hand before final acceptance can be made, and seeding or sodding is out-of-season or disallowed by the City/Design Professional, the Contractor shall construct one of the following erosion control measures:

SECTION 01570 – TEMPORARY EROSION AND SEDIMENT CONTROL: continued

- a. Incorporate the use of erosion control fencing immediately downstream of vulnerable areas that are susceptible to the formation of small streams. Maintain the erosion control devices until seeding or sodding season returns. Upon return of the sodding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and sodded at the direction of the City/Design Professional See Section 32 92 00 for additional requirements.
  - b. Terrace the ground with graded berms and incorporate the use of both temporary slope drains (See ESCS Section 10.03.4.3 and Section 31 20 50 for additional requirements) and erosion control fencing (as specified in this Section). Maintain the erosion control devices until seeding season returns. Upon return of the seeding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and seeded at the direction of the City/Design Professional See Section 32 92 00 and for additional requirements.
  - c. Place seed and irrigate as directed by Section 32 92 00. Maintain the erosion control devices until seeding season returns. Upon return of the seeding season the Contractor shall re-establish the grade and replace all dead seed at the direction of the City/Design Professional. See Section 32 92 00 for additional requirements.
2. Silt fence shall be installed, inspected and maintained in accordance with Drawing C006 – Erosion Control Details.

3.04 MAINTENANCE AND REPAIR

1. The Contractor is responsible for maintain all erosion and sediment control measures until acceptance of the Project by the City.
2. Erosion control measures showing evidence of overtopping, breaks or erosion shall be repaired or replaced with suitable materials.
3. All sediment control devices shall be regularly maintained so that sediment will not enter the storm sewer system.
4. Repair and clean-out all control measures that are not functioning properly.
5. Remove temporary measures that are no longer needed.
6. Seeded areas requiring maintenance (such as re-seeding or watering) shall be promptly addressed. See Section 32 92 00 for additional requirements.

3.05 WARRANTY

1. Seeding work shall have taken root and established satisfactory coverage before acceptance by the City. The contractor shall maintain as described in paragraph 3.03C above and shall guarantee seeding for one (1) year after acceptance. The Contractor shall scarify and re-seed any barren area greater than one (1) square foot. See Section 32 16 00.

END OF SECTION 01570

## SECTION 01580 – PROJECT SIGNS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Contractor shall provide all material, labor and equipment necessary for the fabrication, printing and installation of Project signs.
- B. This section covers project sign requirements for all Kansas City, Missouri – Water Services Department projects. Project sign requirements include the following:
  - 1. Project identification sign description.
  - 2. Project sign installation.
  - 3. Maintenance and removal of Project sign.
  - 4. Printing of signs.
  - 5. Installation of signs.
- C. Related Work Specified Elsewhere:
  - 1. Section 01015 – Specific Work Requirements.
  - 2. Section 01340 – Submittals.

#### 1.02 SPECIFICATION MODIFICATION

- A. It is understood that throughout this section, these Specifications may be modified by appropriate items in Section 01015 or as otherwise indicated on the Contract Drawings.

#### 1.03 INFORMATION PROVIDED BY THE CITY

- A. City shall provide the graphic design templates of the Project sign in an electronic format to be used in the printing process.

#### 1.04 SUBMITTALS

- A. The Contractor shall submit to the City/Design Professional for review and approval, in accordance with Section 01340.
- B. The Contractor shall submit the following to the City/Design Professional for review and approval:
  - 1. Project Sign Locations submit for review and approval a map of the Project area of marked up Drawings showing the location and orientation of the project sign no later the date of the Preconstruction Meeting. The project sign shall be located near the access road entrance to be easily viewed from Robinson Pike Road.
  - 2. Submit for review and approval notifications to homeowners and business adjacent to the location of the Project signs.
  - 3. If the Contractor has salvaged placards from previous projects, they may be re-used if approved by the City. Submit color photographs that accurately show the condition of each placard to be re-used for review and approval.
  - 4. Submit written notification to City that the Project signs have been removed.

### PART 2 - PRODUCTS

#### 2.01 PRINTERS

- A. A list of printing companies that have previous experience with printing signs for the City are included in Section 01015.

#### 2.02 FRAME

- A. Metal frame and hardware shall be in conformance with Water Services standard detail D-Installation Detail for Project Signs (see Figure 3).

SECTION 01580 – PROJECT SIGNS: continued

2.03 PLACARDS

- A. Upper Placard Size 6 feet wide by 4 feet tall.
- B. Lower Placard Size 6 feet wide by 1 foot tall.
- C. Material Coroplast® corrugated plastic sheeting or approved equal.
- D. Sheeting Thickness – ½ inch.
- E. Sheeting Color – white.
- F. Print Method – direct to Coroplast® with outdoor UV laminate coating.

2.04 PLACARD CONTENT

- A. Construction Phase Upper Placard for each Project sign the Contractor shall provide an upper placard which will be displayed through construction. An example of the Construction Phase Upper Placard is shown in Figure 1.
- B. Post-Construction Phase Upper Placard for each Project sign the Contractor shall provide an upper placard which will be displayed post construction. An example of the Construction Phase Upper Placard is shown in Figure 2.
- C. Lower Placard for each Project sign, the Contractor shall provide a lower placard Examples of the Lower Placard are shown in Figures 1 and 2.
- D. The City will provide digital files for all placards and graphic images.

2.05 NUMBER OF SIGNS TO BE PROVIDED

- A. The number of project signs to be provided is defined in Section 01015 Specific. Each Project sign includes the following:
  - 1. One (1) Construction Phase Upper Placard to be displayed during construction.
  - 2. One (1) Post-Construction Phase Upper Placard to be displayed after completion of the Work.
  - 3. One (1) Lower Placard to be displayed during construction and post-construction.
  - 4. Printing of placards.
- B. Frame as shown in Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 3).

PART 3 - EXECUTION

3.01 INSTALLATION AND PLACEMENT OF SIGNS

- A. Installation Project signs shall be fabricated and installed in accordance with Water Services standard detail D- Installation Detail for Project Signs (see Figure 3).
- B. Location Project signs shall be located within the Site as defined by Section 00700 General Conditions. Project signs shall be erected in a conspicuous place but shall not interfere with the vision of pedestrian or vehicular traffic such as to create a hazard Signs shall be located in the public right of way or in an easement acquired for the Project Locations of the signs shall be coordinated with the City prior to installation and submitted accordance with paragraph 1.04 of this Section.
- C. The Contractor shall notify any homeowners or businesses adjacent to the location of the signs at least three (3) days prior to erecting signs.
- D. Project sign(s) shall be erected t less than two (2) days before the start of construction activities. No construction activities are allowed until the Project signs are erected.
- E. Project signs shall remain in place for the duration of the Project and shall be maintained in a true, plumb and neat condition.

SECTION 01580 – PROJECT SIGNS: continued

3.02 REPLACEMENT OF UPPER PLACARDS

- A. Upon completion of the Work and at the direction the City, the Contactor shall remove the Construction Phase Upper Placard (Figure 1) on all Project signs and replace them with the Post-Construction Upper Placard (Figure 2).
- B. The Lower Placards are to remain in place.

3.03 REMOVAL OF PROJECT SIGNS

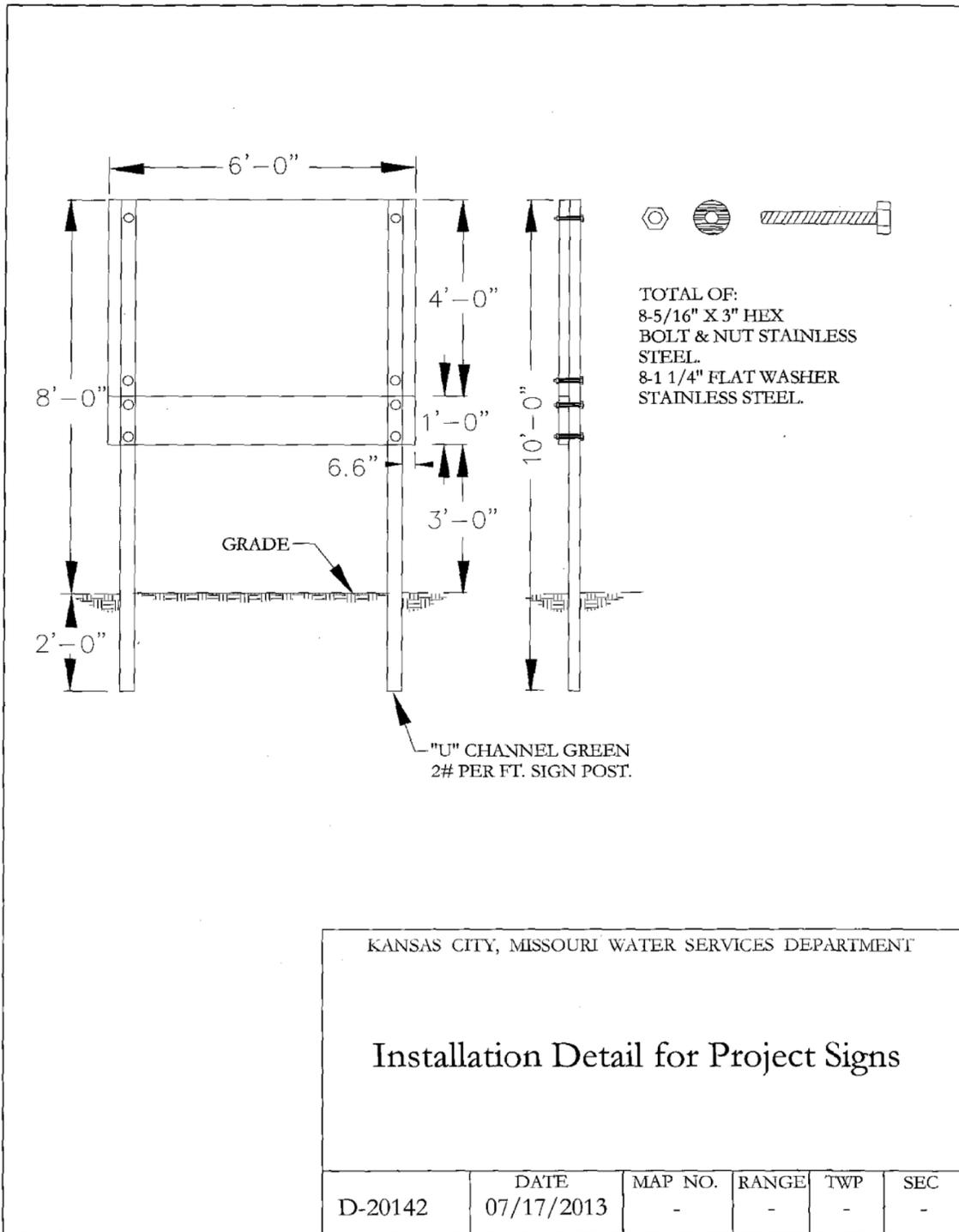
- A. All Project signs shall be maintained for thirty (30) calendar days after completion of the Work or as otherwise directed by the City.
- B. Contractor shall remove all Project signs and restore the area disturbed by construction activities.
- C. Project signs shall be removed from the Project areas and will become property of the Contractor.
- D. The Contractor may dispose of Project signs or salvage and reuse them on future City projects. The City will assess the condition of the signs and determine the appropriateness of reuse.
- E. Within three (3) days of the removal of signs, Contractor shall provide the City written notice that all Project signs have been removed from the Site.



Figure 1 – Example Construction Phase Upper Placard and Lower Placard



Figure 2 – Example Post-Construction Phase Upper Placard and Lower Placard



**Figure 3 – Installation Detail for Project Signs**

END OF SECTION

## SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes administrative and procedural requirements governing Contractor's selection of products for use in the Project.
- B. Related Work Specified Elsewhere:
  - 1. Division 03 – Concrete.
  - 2. Division 07 – Thermal & Moisture Protection.
  - 3. Division 08 – Doors and Windows.
  - 4. Division 09 – Finishes.
  - 5. Division 23 – Heating, Ventilating, and Air Conditioning (HVAC).
  - 6. Division 26 – Electrical.
  - 7. Division 31 – Earthwork.
  - 8. Division 32 – Exterior Improvements.
  - 9. Division 33 – Utilities.
  - 10. Division 40 – Process Integration.
- C. Section 01320 – Construction Progress Documentation.
- D. Section 01340 – Submittals.

#### 1.02 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in these Contract Documents, such as "specialties," "systems," "structures," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
  - 1. Products: Items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "Material," "Equipment," "system," and terms of similar intent.
    - a. Named Products: Items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
    - b. Foreign Products: Distinguished from "domestic products," are items substantially manufactured (50% or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50%) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
  - 2. Materials: Products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.
  - 3. Equipment: Product with operational or nonoperational parts, whether motorized, or manually operated, that may require service connections, such as wiring or piping.

#### 1.03 SUBMITTALS

- A. Submittal of preliminary procurement schedule is specified in Section 01320.
- B. Submittals for products are specified in Section 01340 and in applicable Sections of Division 03 through Division 40.

#### 1.04 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING: continued

1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete Project requirements in a timely manner, consult with Engineer to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.
- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
  1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.
  2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, Engineer will determine which products shall be retained and which are incompatible and must be replaced.
- C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
  1. No available domestic product complies with the Contract Documents.
  2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.
- D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
  1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
  2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated Equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
    - a. Name of product and manufacturer including address (and telephone number).
    - b. Model and serial number.
    - c. Capacity.
    - d. Speed.
    - e. Ratings.
- E. Electronic Equipment Compliance:
  1. Contractor warrants that all equipment, devices, items, systems, software, hardware, or firmware provided shall properly, appropriately, and consistently function and accurately process date and time data (including without limitation: calculating, comparing, and sequencing). This warranty supercedes anything in the Specifications or other Contract Documents which might be construed inconsistently. This warranty is applicable whether the equipment, device, item, system, software, hardware, or firmware is specified with or without reference to a manufacturer's name, make, or model number.

1.05 TRANSPORTATION AND SHIPMENT:

- A. Shipment Preparation.
  1. Contractor shall require manufacturers and Suppliers to prepare products for shipment in a manner to facilitate unloading and handling, and to protect against damage,

SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING: continued

deterioration, or unnecessary exposure to the elements in transit and storage. Provisions for protection shall include the following:

- a. Crates or other suitable packaging materials.
  - b. Covers and other means to prevent corrosion, moisture damage, mechanical injury, and accumulation of dirt in motors, electrical equipment, and machinery.
  - c. Suitable rust-preventive compound on exposed machined surfaces and unpainted iron and steel.
  - d. Grease packing or oil lubrication in all bearings and similar items.
- B. Marking: Each product item shall be tagged or marked as identified in the delivery schedule or on Submittals. Complete packing lists and bills of material shall be included with each shipment. Each piece of every item need not be marked separately, provided that all pieces of each item are packed or bundled together, and the packages or bundles are properly tagged or marked.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
1. Schedule delivery to minimize long-term storage at the Site and to prevent overcrowding of construction spaces. Allow ample time to avoid delay of the Work.
  2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  3. Deliver products to the Site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected. Inspect shipment to assure:
    - a. Product complies with requirements of Contract Documents and reviewed Submittals.
    - b. Quantities are correct.
    - c. Containers and packages are intact and labels are legible.
    - d. Products are properly protected and undamaged.
  5. Store products at the Site in a manner that will facilitate inspection and measurement of quantity or counting of units. Mark deliveries of component parts of Equipment to identify the Equipment, to permit easy accumulation of parts, and to facilitate inspection and measurement of quantity or counting of units.
  6. Store heavy Materials away from the Project structure in a manner that will not endanger the supporting construction.
  7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, and with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
  8. Protect motors, electrical Equipment, plumbing fixtures, and machinery of all kinds against corrosion, moisture deteriorations, mechanical injury, and accumulation of dirt or other foreign matter. All space heaters furnished in equipment shall be connected and operated continuously.
  9. Protect exposed machined surfaces and unpainted iron and steel as necessary with suitable rust preventive compounds.
  10. Protect bearings and similar items with grease packing or oil lubrication.

SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING: continued

11. Handle and store steel plate, sheet metal, and similar items in a manner to prevent deformation.
  12. For storage of pipe and other products on easements and rights-of-way in residential and commercial areas, do not exceed the minimum required by scheduled laying operations, and conform to all requirements of public authorities. Store or place pipe along roads, set back from shoulder or curb, and at an angle tending to deflect vehicles if struck. Place or block pipe to preclude its accidental movement.
- B. Handling:
1. Provide equipment and personnel necessary to unload and handle products, by methods to prevent damage or soiling to products, or packaging.
  2. Handle by methods to prevent bending or overstressing. Where lifting points are designated, lift components only at those points.
  3. Provide additional protection to surrounding surfaces as necessary to prevent damage.
- C. Maintenance of Storage.
1. Inspect stored products on a scheduled basis.
  2. Verify that storage facilities comply with manufacturer's product storage requirements, including environmental conditions continually maintained.
  3. Verify that surfaces of products exposed to elements are not adversely affected; that any weathering of finishes is acceptable under requirements of Contract Documents.
  4. For mechanical and electrical Equipment in long term storage, provide manufacturer's service instructions to accompany each item, with notice of enclosed instructions on exterior of package. Service Equipment on a regularly scheduled basis.
- D. Protection after Installation: Provide substantial coverings as necessary to protect installed products from damage from subsequent construction operations. Remove coverings when no longer needed or as specified.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION:

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise specified or indicated, new at the time of installation.
1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
  2. Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Continued Availability: Where, because of the nature of its application, Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard products for which the manufacturer has published assurances that the products and its parts are likely to be available to Owner at a later date.
  4. Conform to applicable Specifications, codes, standards, and regulatory agencies.
  5. Comply with size, make, type, and quality specified, or as specifically approved in writing by Engineer.
  6. Manufactured and Fabricated Products:
    - a. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
    - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
    - c. Equipment and Materials shall be suitable for service conditions intended.

SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING: continued

- d. Equipment capacities, sizes, and dimensions indicated or specified shall be adhered to unless variations are specifically approved in writing by Engineer.
- e. Provide labels and nameplates where required by regulatory agencies or to state identification and essential operating data.
7. Do not use products for any purpose other than that for which designed.
8. To the fullest extent possible, provide products of the same kind from a single source.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS:

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place except as required for proper movement and performance, and accurately located and aligned with other Work.
  1. Obtain and distribute copies of manufacturer's printed instructions and recommendations if not a part of Submittals, containers, or packaging to parties involved in the installation, including a copy to Engineer and Resident Project Representative.
  2. Maintain one complete set of instructions at the Site during installation and until completion.
  3. Handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformance with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

3.02 PERFORMANCE:

1. City Projects are covered by a general NPDES permit maintained by the Water Services Department's Storm Water Division. The Permit imposes a number of obligations including but not limited to, the following:
  - a. Project must be reported to Missouri Department of Natural Resources (MDNR) 90 days before the Project starts.
  - b. Each site must have and follow a writing SWPPP. Each site must be inspected weekly and following each rain event, for compliance with the SWPPP. Written inspection reports must be kept.
  - c. All personnel on site must be briefed on the requirements of the SWPPP.
  - d. A copy of the SWPPP must be on site at all times.
  - e. All deficient items shall be promptly corrected. In no case shall the correction period exceed two calendar days.
  - f. Quarterly reports must be filed by the City with MDNR identifying and giving the status and percent complete of each Project.
  - g. MDNR must be notified if hazardous substances or contaminated soil are discovered on site.
2. The Contractor shall follow the approved SWPPP, as well as all erosion control measures included in the Contract Documents and implement other BMP measures as directed by the City/Design Professional.
3. Contractor shall prevent erosion during his operations until vegetation is re-established. The Contractor shall prepare erosion control plans and submit in writing to the City/Design Professional any proposed modifications to the plans. The proposed

SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING: continued

modifications shall describe materials that will be used and the tasks that will be performed to control runoff the site.

4. Erosion control devices shall be in place before land is disturbed.
5. All earthen structures shall be seeded according to Section 32 92 00.
6. Vegetation shall be established to provide adequate protection or develop other suitable means.
7. Sediment trapping devices shall be installed in the proper location prior to any grading.
8. The Contractor shall establish sediment trapping devices that functions properly.
9. The Contractor shall prevent sediment from leaving the site and/or from damaging adjacent property.
10. The Contractor shall prevent and or remove mud on public roads or at intersections with public roads that is related to the Project work being completed.
11. The Contractor shall provide a temporary construction entrance to reduce/eliminate transport of mud from the construction site onto public right of way.
12. Contractor shall provide dust control measures for any graveled areas or exposed soil areas. See this Section Paragraph 3.03A Dust Control for additional requirements.
13. Contractor shall temporarily or permanently stabilize all areas with exposed soil. See Section 32 92 00.
14. The Contractor shall adequately stabilize all finished cut and fill slopes.
15. All on-site drainage channels and outlets shall be adequately stabilized.

3.03 INSTALLATION:

1. Methods, materials and maintenance shall be the sole responsibility of the Contractor. The Contractor and the City/Design Professional shall conduct weekly onsite inspections using the “Erosion and Sediment Control Checklist” provided by the Water Services Department Remove any onsite pollutant sources (debris piles with petroleum cans, chemical containers, fueling trucks/tanks or other possible sources of pollution). Upon notification of a weather forecast with a reasonable likelihood of rain, or at the direction of the City/Design Professional, the Contractor shall construct temporary berms and install erosion control fencing as necessary to control the potential eroded sediment and prevent it from leaving the construction area. If the Contractor’s construction operations are complete to the point where seeding is the major item at hand before final acceptance can be made, and seeding or sodding is out-of-season or disallowed by the City/Design Professional, the Contractor shall construct one of the following erosion control measures:
  - a. Incorporate the use of erosion control fencing immediately downstream of vulnerable areas that are susceptible to the formation of small streams. Maintain the erosion control devices until seeding or sodding season returns. Upon return of the sodding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and sodded at the direction of the City/Design Professional See Section 32 92 00 for additional requirements.
  - b. Terrace the ground with graded berms and incorporate the use of both temporary slope drains (See ESCS Section 10.03.4.3 and Section 31 20 50 for additional requirements) and erosion control fencing (as specified in this Section). Maintain the erosion control devices until seeding season returns. Upon return of the seeding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and seeded at the direction of the City/Design Professional See Section 32 92 00 and for additional requirements.

SECTION 01600 – PRODUCT DELIVERY, STORAGE, AND HANDLING: continued

- c. Place seed and irrigate as directed by Section 32 92 00. Maintain the erosion control devices until seeding season returns. Upon return of the seeding season the Contractor shall re-establish the grade and replace all dead seed at the direction of the City/Design Professional. See Section 32 92 00 for additional requirements.
2. Silt fence shall be installed, inspected and maintained in accordance to the Drawing C006 – Erosion Control Details.

3.04 MAINTENANCE AND REPAIR

1. The Contractor is responsible for maintain all erosion and sediment control measures until acceptance of the Project by the City.
2. Erosion control measures showing evidence of overtopping, breaks or erosion shall be repaired or replaced with suitable materials.
3. All sediment control devices shall be regularly maintained so that sediment will not enter the storm sewer system.
4. Repair and clean-out all control measures that are not functioning properly.
5. Remove temporary measures that are no long needed.
6. Seeded areas requiring maintenance (such as re-seeding or watering) shall be promptly addressed. See Section 32 92 00 for additional requirements.

3.05 WARRANTY

1. Seeding work shall have taken root and established satisfactory coverage before acceptance by the City. The contractor shall maintain as described in paragraph 3.03C above and shall guarantee seeding for one (1) year after acceptance. The Contractor shall scarify and re-seed any barren area greater than one (1) square foot. See Section 32 16 00.

END OF SECTION 01600



## SUBSTITUTION REQUEST

Project/Contract Number: 80001977/9618

Project Title: Prospect Elevated Water Storage Tanks

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To: \_\_\_\_\_ Authorization Number: \_\_\_\_\_  
From: \_\_\_\_\_  
Re: \_\_\_\_\_ Date: \_\_\_\_\_  
Contract For: \_\_\_\_\_

---

Specification Title: \_\_\_\_\_  
Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

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Proposed Substitution: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone No. \_\_\_\_\_  
Trade Name: \_\_\_\_\_ Model No. \_\_\_\_\_  
Installer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone No. \_\_\_\_\_  
History:  New Product  2-5 years old  5-10 years old  More than 10 years old  
Differences between proposed substitution and specified product: \_\_\_\_\_

---

Point-by-point comparative data attached – REQUIRED

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Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
  - Same warranty will be furnished for proposed substitution as for specified product.
  - Same maintenance, service, and availability of replacement parts, as applicable, are available.
  - Proposed substitution will not affect or delay Progress Schedule, except as stated below.
  - Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
  - Proposed substitution does not affect dimensions and functional clearances, except as stated below.
  - Payment will be made for changes to building design, including architectural or engineering design, detailing, licenses, royalties, and construction costs caused by the requested substitution.
  - Coordination, installation, and changes in the Work as necessary for accepted substitution will be completed in all respects.
- 

Reason for not providing specified item: \_\_\_\_\_

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Similar Installation:

Project: \_\_\_\_\_ Design Professional: \_\_\_\_\_  
Address: \_\_\_\_\_ Owner: \_\_\_\_\_  
Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work:  No  Yes; explain \_\_\_\_\_

---

Savings to Owner for accepting substitution: \_\_\_\_\_

---

Proposed substitution changes Contract Time:  No  Yes; add/deduct \_\_\_\_\_ days.

Supporting Data Attached:

Product Data  Drawings  Tests  Reports  Samples  \_\_\_\_\_

Attachments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Submitted by: \_\_\_\_\_

Signature: \_\_\_\_\_

Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-Mail: \_\_\_\_\_

Additional Comments:  Contractor  Subcontractor  Supplier  Manufacturer  DP  \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### DESIGN PROFESSIONAL'S REVIEW AND ACTION

- Substitution approved – Make submittals in accordance with Specification Section 01300.
- Substitution approved as noted – Make submittals in accordance with Specification Section 01300.
- Substitution rejected – Use specified materials.
- Substitution Request received too late – Use specified materials.

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Distribution:  Owner  
 Design Professional  
 Contractor  
 Consultant  
 Construction Manager  
 Other

## SECTION 01640 – PRODUCT SUBSTITUTIONS

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Related Work Specified Elsewhere:
  - 1. Section 01320 – Construction Progress Documentation.
  - 2. Section 01340 – Submittals.
  - 3. Section 01600 – Product Delivery, Storage, and Handling.

#### 1.02 DEFINITIONS

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Changes in products, Materials, Equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
  - 1. Revisions to the Contract Documents requested by Owner or Engineer.
  - 2. Specified options of products and construction methods included in the Contract Documents.
  - 3. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

#### 1.03 SUBMITTALS

- A. Substitution Request Submittal: Engineer will consider requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of Engineer.
  - 1. Submit electronic version of each request for substitution for consideration in Adobe \*PDF Format. Submit requests in the form and according to procedures required for Change Order proposals. Requests for substitution shall not be submitted in the form of a Request for Information (RFI).
  - 2. Identify the Equipment or Material, the fabrication, or installation method to be replaced in each request. Include related Specification Section/Article and Drawing numbers.
  - 3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
    - a. Statement indicating why specified product or method of construction cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
    - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - d. Product data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Identification of available sales, maintenance, repair, and replacement services.

SECTION 01640 – PRODUCT SUBSTITUTIONS: continued

- g. A statement indicating the effect of the substitution on Contractor's construction progress schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on the overall Contract Times. If specified product cannot be provided within the Contract Times, provide letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delay in delivery.
  - h. An itemized estimate of costs that will result directly or indirectly from approval of the substitution, including:
    - (1) A proposal of the net change, if any, in the Contract Price.
    - (2) Costs of redesign required by the proposed change.
    - (3) Costs of resulting claims as determined in coordination with other contractors having work on the Project affected by the substitution.
  - i. Statement indicating whether or not incorporation or use of the substitute is subject to payment of any license fee or royalty.
  - j. Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents, will perform adequately the functions and achieve the results called for by the general design, is similar in substance to that specified, and is suitable for same use as that indicated and specified.
  - k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
4. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within two weeks of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of the substitution within two weeks of receipt of the request, or two weeks of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a Change Order.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS:

- A. Conditions: Engineer will receive and consider Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by Engineer. If the following conditions are not satisfied, Engineer will return the requests without action except to record noncompliance with these requirements.
  - 1. Extensive revisions to the Contract Documents are not required.
  - 2. Proposed substitution is in keeping with the general intent of the Contract Documents and will produce indicated results.
  - 3. Substitution request is timely, fully documented, and properly submitted.
  - 4. The specified product or method of construction cannot be provided within the Contract Times. Engineer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
  - 5. The requested substitution offers Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  - 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

SECTION 01640 – PRODUCT SUBSTITUTIONS: continued

7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility.
  8. The specified product or method of construction cannot be coordinated with other materials and where Contractor certifies that the proposed substitution can be coordinated.
  9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where Contractor certifies that the proposed substitution provides the required warranty.
- B. Engineer's review and acceptance of Submittals shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents. Engineer's acceptance of Submittals not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval of a substitute. Acceptance by Engineer shall not relieve Contractor from responsibility for errors or omissions in the Submittals.
- C. Reference General Conditions and Supplementary Conditions for additional information and Owner's cost reimbursement for review.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS:

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place except as required for proper movement and performance, and accurately located and aligned with other Work.
1. Obtain and distribute copies of manufacturer's printed instructions and recommendations if not a part of Submittals, containers, or packaging to parties involved in the installation, including a copy to Engineer and Resident Project Representative.
  2. Maintain one complete set of instructions at the Site during installation and until completion.
  3. Handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformance with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01640

## SECTION 01770 – CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section provides for the procedures and submittals required by City prior to acceptance of the Work including, but not limited to, the following:
  - 1. Final Acceptance.
  - 2. Final Clean-Up.
  - 3. Project Record Documents.
- B. Related Work Specified Elsewhere:
  - 1. Section 00700 – General Conditions.
  - 2. Section 01340 – Submittals.
  - 3. Section 01785 – Warranties.

#### 1.02 SUBSTANTIAL COMPLETION:

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following:
  - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100% completion for the portion of the Work claimed as Substantially Complete.
    - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.
    - b. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete Work, and reasons the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship Bonds, maintenance agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases enabling Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Submit record drawings, instruction books and operating manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver tools, spare parts, extra stock, and similar items.
  - 7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 8. Complete start-up testing of systems and instruction of Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the Site, along with mockups, construction tools, and similar elements.
  - 9. List any exception to the above requirements in the request, the reason for the exception being requested, and the period of time for the exception to be cleared.
- B. Inspection Procedures: On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare the Certificate of Substantial Completion following inspection or advise Contractor of construction that must be completed or corrected before the certificate will be issued.
  - 1. Engineer will repeat inspection when requested and assured by Contractor that the Work is Substantially Complete.
  - 2. Results of the completed inspection will form the basis of requirements for final acceptance.

SECTION 01770 – CLOSEOUT PROCEDURES: continued

1.03 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following:
  - 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
  - 2. Submit an updated final statement, accounting for final additional changes to the Contract Price.
  - 3. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by Engineer.
  - 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the Date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  - 5. Submit consent of surety to final payment.
  - 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 7. Submit a final liquidated damages settlement statement.
  - 8. List any exception to the above requirements in the request, the reason for the exception being requested, and the period of time for the exception to be cleared.
- B. Reinspection Procedure: Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Engineer.
  - 1. Upon completion of reinspection, Engineer will prepare a certificate of final acceptance. If the Work is incomplete, Engineer will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
  - 2. If necessary, reinspection will be repeated.

1.04 PROJECT RECORD DOCUMENTS

- A. Contractor shall submit all Record Documents in accordance with Section 01340.
- B. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for Engineer's reference during normal working hours.
- C. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
  - 1. Record information concurrently with construction progress.
  - 2. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Mark each document "PROJECT RECORD" in neat, large, printed letters.
  - 3. Mark new information that is important to Owner but was not shown on Contract Drawings or Shop Drawings.
  - 4. Note related Change Order numbers where applicable.

SECTION 01770 – CLOSEOUT PROCEDURES: continued

5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
6. Upon completion of the Work, submit record drawings to Engineer for Owner's records.
7. Include the following:
  - a. Depths of various elements of foundation in relation to finish first floor datum.
  - b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - c. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.
  - d. Where Submittals are used for mark up, record a cross reference at corresponding location on Drawings.
  - e. Field changes of dimension and detail.
  - f. Changes made by Change Order or other Modifications.
  - g. Details not on original Contract Drawings.
- D. Record Specifications: Maintain one complete copy of the Project Manual including Addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction.
  1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
  2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
  3. Note related record drawing information and product data.
  4. Upon completion of the Work, submit record Specifications to Engineer for Owner's records.
  5. Include the following:
    - a. Manufacturer, trade name, catalog number, and Supplier of each product and item of Equipment actually installed, particularly optional and substitute items.
    - b. Changes made by Addendum, Change Order, or other Modifications.
    - c. Related Submittals.
- E. Record Product Data: Maintain one copy of each product data Submittal. Note related Change Orders and markup of record Drawings and Specifications.
  1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Site and from the manufacturer's installation instructions and recommendations.
  2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
  3. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.
- F. Record Samples Submitted: Immediately prior to Substantial Completion, Contractor shall meet with Engineer and Owner's personnel at the Project Site to determine which Samples are to be transmitted to Owner for record purposes. Comply with Owner's instructions regarding packaging, identification, and delivery to Owner.
- G. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records, and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Engineer for Owner's records.

SECTION 01770 – CLOSEOUT PROCEDURES: continued

- H. Operation and Maintenance Instructions: Arrange for each installer of Equipment that requires regular maintenance to meet with Owner's personnel at Project Site to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:
    - 1. Instruction books and operating manuals.
    - 2. Record documents.
    - 3. Spare parts and materials.
    - 4. Tools.
    - 5. Lubricants.
    - 6. Fuels.
    - 7. Identification systems.
    - 8. Control sequences.
    - 9. Cleaning
    - 10. Warranties and bonds.
    - 11. Maintenance agreements and similar continuing commitments.
  - I. Instruction Books and Operating Manuals: Organize operation and maintenance data into suitable sets of manageable size as specified in Section 01340.
  - J. Warranties and Bonds: Specified in Section 01785 and Section 00700.
- 1.05 FINAL CLEAN-UP:
- A. Contractor shall replace all surface material and restore paving, curbing, sidewalks, gutters, shrubbery, fences, sod, and other surfaces disturbed to a condition of equal or better than original condition.
  - B. All excavated material shall be removed and disposed of properly.
  - C. Contractor shall provide material for filling depressions caused by settlement.
  - D. Contractor shall remove surplus pipe materials, tools, temporary structures, and rubbish. Restore construction site to its original condition or better.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01770

## SECTION 01785 – WARRANTIES

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.
- B. Related Work Specified Elsewhere:
  - 1. Section 00700 – General Conditions.
  - 2. Section 00800 – Supplementary Conditions.
  - 3. Section 01340 – Submittals.
  - 4. Section 01780 – Contract Closeout Procedures.
  - 5. Division 03 – Concrete.
  - 6. Division 07 – Thermal & Moisture Protection.
  - 7. Division 08 – Doors and Windows.
  - 8. Division 09 – Finishes.
  - 9. Division 23 – Heating, Ventilating, and Air Conditioning (HVAC).
  - 10. Division 26 – Electrical.
  - 11. Division 31 – Earthwork.
  - 12. Division 32 – Exterior Improvements.
  - 13. Division 32 – Utilities.
  - 14. Division 40 – Process Integration.
  - 15. Certifications and other commitments and agreements for continuing services to Owner as specified throughout the Contract Documents.
- C. Refer to Section 00700 and Section 00800 for terms of the Contractor's period for correction of the Work.
- D. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve Suppliers, manufacturers, and Subcontractors required to countersign special warranties with Contractor.
- E. Specific Provision: Warranty on all Equipment and Materials provided under this Contract shall be the longer of the following:
  - 1. 30 months from delivery.
  - 2. 24 months from Substantial Completion.
- F. Specific Provision: If any item of Equipment (in part or the whole unit) or Materials requires replacement due to failure to perform its intended duty within the applicable warranty time stated above, the warranty duration for that item as an entire unit shall become whichever duration of the following is longer:
  - G. 30 months from the original delivery date of the equipment.
  - H. 24 months from the original date of Substantial Completion of the equipment.
  - I. 12 months from startup of the item as an entire unit with required replacement parts installed.
- J. Specific Provision: The warranty duration periods indicated above shall supersede any and all standard manufacturer's warranty provisions unless those standard manufacturer warranty provisions provide a duration longer than that stated above and/or provide more stringent warranty requirements. Warranty durations stated elsewhere in these Specifications that are longer in duration than stated in Paragraph 1.01 shall supersede those included in this Paragraph 1.01.

SECTION 01785 – WARRANTIES: continued

1.02 DEFINITIONS:

- A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by manufacturer to Owner.
- B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for Owner.

1.03 WARRANTY REQUIREMENTS:

- A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted construction.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be as previously defined in this Section.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Expressed warranties made to Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the Law. Expressed warranty periods shall not be interpreted as limitations on the time in which Owner can enforce such other duties, obligations, rights, or remedies.
  - 1. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, Owner reserves the right to refuse to accept the Work, until Contractor presents evidence that entities required to countersign such commitments are willing to do so.
- F. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the contract Documents.

1.04 SUBMITTALS:

- A. Submit written warranties to Engineer prior to the date certified for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the Date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of Engineer.
  - 1. When a designated portion of the Work is completed and occupied or used by Owner, by separate agreement with Contractor during the construction period, submit properly executed warranties to Engineer within 15 days of completion of that designated portion of the Work.
- B. When the Contract Documents require Contractor, or Contractor and a Subcontractor, Supplier, or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by required parties. Submit a draft to Owner, through Engineer, for approval prior to final execution.
  - 1. Refer to Divisions 03 through 40 Sections for specific content requirements and particular requirements for submitting special warranties.

SECTION 01785 – WARRANTIES: continued

- C. Form of Submittal: At Final Completion, compile two copies of each required warranty properly executed by Contractor, or by Contractor and a Subcontractor, Supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Contract Documents.
- D. Bind warranties and bonds in heavy-duty, commercial-quality, durable three-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the installer.
  - 2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," and as required by Section 01340.
  - 3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01785

## DIVISION 03 - CONCRETE

### SECTION 03 10 00 – CONCRETE FORMWORK

#### PART 1 - GENERAL

##### 1.01 SUMMARY:

- A. This Section includes formwork for cast-in-place concrete.

##### 1.02 RELATED REQUIREMENTS:

- A. SECTION 03 20 00 – CONCRETE REINFORCEMENT.
- B. SECTION 03 30 00 – CONCRETE.

##### 1.03 REFERENCE STANDARDS:

- A. Applicable Standards:
  - 1. American Concrete Institute (ACI):
    - a. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
    - b. ACI 301 - Specifications for Structural Concrete.
    - c. ACI 318 - Building Code Requirements for Reinforced Concrete.
    - d. ACI 347R - Guide to Formwork for Concrete.
  - 2. ASTM International (ASTM):
    - a. ASTM C31/C31M REV A – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
    - b. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
    - c. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS FOR FACING:

- A. Where concrete will be exposed to view after construction:
  - 1. Use exterior grade plywood at least 5/8 inch thick or steel forms capable of producing a smooth, uniform appearance.
  - 2. Do not use form-facing materials with raised grain, torn surfaces, worn edges, dents, or other defects that will impair the texture of concrete surfaces.
- B. Where concrete will not be exposed to view after construction:
  - 1. Exterior grade plywood at least 5/8 inch thick.
  - 2. Steel.
  - 3. Wood fiberboard.
  - 4. Dressed lumber free of loose knots.
- C. Treat forms with commercially available form releasing agents that will not bond with, stain, or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion, nor shall it impede the wetting of surfaces to be cured with water or curing compounds. Form releasing agents shall be VOC compliant with a maximum VOC content of 3.8 lbs./gal. (450 g/L), or less where area restrictions are more stringent.
- D. Clean forms of sawdust, dust, dirt, and other foreign materials.

##### 2.02 FORM TIES:

- A. Break back, coil, or screw type, except where otherwise specified.

SECTION 03 10 00 – CONCRETE FORMWORK: continued

- B. Use water-seal coil type in walls below grade and in walls of water bearing structures. Removable through-wall tapered ties shall not be used.
- C. Coil type shall leave conical depression in concrete.
- D. Space as required against pressure of fresh concrete.
- E. The portion of the form tie remaining in place shall provide for a clearance of two times the minimum dimension of the tie, but not less than 3/4 inch, from the formed surface.

2.03 CHAMFER STRIPS:

- A. Chamfer: 3/4 inch except where otherwise indicated.
- B. Place in all forms to provide chamfer where concrete will have exposed projecting corners.

PART 3 - EXECUTION

3.01 FORM CONSTRUCTION:

- A. Conform to ACI 301, 318, and 347R, except Shop Drawings for formwork, shoring, and reshoring shall not be submitted for approval.
- B. Adequately brace, stiffen, and support forms to prevent perceptible deflection or settlement, and to hold plumb, level, and true to line.
- C. Construct and maintain forms to the tolerances given in ACI 117.
- D. Construct sufficiently tight to prevent mortar leakage.
- E. Avoid offsets between adjacent forms and construct so that shores, braces, and stiffening members are in line with those below.
- F. Space studs and stringers as required to support facing against concrete pressure, but not more than 12 inches for 5/8-inch plywood or 16 inches for 3/4-inch plywood. Maximum deflection of facing materials reflected on concrete surfaces exposed to view shall be 1/240 of the span between structural members of the formwork.
- G. Use wales, strongbacks, shores, and bracing as required.
- H. Form all necessary openings or chases for piping, ductwork, and similar items where indicated or as required for the Work.
- I. Construct forms to be removable in sections without marring concrete surface.
- J. Surface of forms shall provide a smooth, dense, plane surface to finished concrete where exposed to view.
- K. Contractor shall be responsible for structural adequacy, design, engineering, and construction of the formwork.
- L. Stay-in-place metal forms shall not be used.

3.02 TIME-IN-PLACE FOR FORMS:

- A. It is the responsibility of Contractor to consider all applicable factors and leave the formwork in place until it is safe to remove them.
- B. All removal shall be performed in a manner which will prevent damage to the concrete and ensure the complete safety of the structure.
- C. Where forms support more than one element, the forms shall not be removed until the form removal criteria are met by all supported elements.
- D. Evidence that concrete has gained sufficient strength to permit removal of forms shall be determined by tests on control cylinders. All control cylinders shall be stored in the structure or as near the structure as possible so they receive the same curing conditions and protection methods as given those portions of the structure they represent. Control cylinders shall be removed from the molds at an age of no more than 24 hours. All control cylinders shall be prepared and tested in accordance with ASTM C31/C31M REV A and ASTM C39/C39M at

SECTION 03 10 00 – CONCRETE FORMWORK: continued

the expense of Contractor by an independent laboratory that complies with ASTM C1077. Control cylinders shall be tested within 4 hours after removal from the Site.

- E. Forms shall not be removed unless the minimum time or minimum compressive strength requirements below are met.
  - 1. Formwork Not Supporting Weight of Concrete:
    - a. Formwork for walls, columns, sides of beams, gravity structures, slabs-on-ground and other vertical type formwork not supporting the weight of concrete shall remain in place 24-hours minimum after concrete placement is completed.
  - 2. Formwork Supporting Weight of Concrete:
    - a. Formwork supporting weight of concrete and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction or other superimposed loads to which the supported concrete may be subjected. As a minimum, no forms or shoring shall be loosened or removed until control concrete test cylinders indicate the concrete has attained the following compressive strengths for the respective structural members:

<u>Structural Member</u>	<u>Percent of Design Compressive Strength</u>
Unshored slab and beam forms or forms which can be removed without disturbing shores	70
Slab or beam shoring	85

END OF SECTION 03 10 00

## SECTION 03 20 00 – CONCRETE REINFORCEMENT

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes steel reinforcement bars, ties, welded wire fabric, bolsters, chair supports, and accessories.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE:

- A. SECTION 03 10 00 - CONCRETE FORMWORK.
- B. SECTION 03 30 00 - CONCRETE.

#### 1.03 REFERENCE STANDARDS:

- A. Applicable Standards:
  - 1. American Society for Testing and Materials (ASTM):
    - a. A615/A615M - Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
    - b. A706/A706M - Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
    - c. A1064/A1064M – Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
  - 2. American Concrete Institute (ACI):
    - a. 301 - Specifications for Structural Concrete.
    - b. SP 66 - Detailing Manual.
    - c. 318 - Building Code Requirements for Structural Concrete.
    - d. 117 - Specifications for Tolerances for Concrete Construction and Materials.
  - 3. American Welding Society (AWS):
    - a. A5.5 - Low Alloy Steel Electrodes for Shielded Metal Arc Welding.
    - b. B2.1 - Welding Procedure and Performance Qualification.
    - c. D1.4 - Structural Welding Code Reinforcing Steel.
  - 4. Concrete Reinforcing Steel Institute (CRSI):
    - a. Manual of Standard Practice.

#### 1.04 SUBMITTALS:

- A. Submit as specified in DIVISION 01.
- B. Include, but not limited to, the following:
  - 1. Complete bar schedule, bar details, and erection drawings to conform to ACI SP 66.
  - 2. Drawing with each type of bent bar marked with identification mark. Straight bars shall have mark number or be identified by size and length.
  - 3. Erection drawings shall be clear, easily legible, and to a minimum scale of:
    - a. 1/4 inch = 1 foot (1:50).
    - b. 1/8 inch = 1 foot (1:100) if bars in each face are shown in separate views.
  - 4. Size and location of all openings.
  - 5. Concrete protective cover.
  - 6. Grade of steel.
  - 7. Lap splice lengths.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Store steel reinforcement blocked up off the ground and in orderly stacks.
- B. Store only bars with the same identifying label in the same stack.

SECTION 03 20 00 – CONCRETE REINFORCEMENT: continued

1.06 TESTING:

- A. Perform at the mill for each heat.
- B. Submit certified test results upon request.

PART 2 - PRODUCTS

2.01 REINFORCEMENT BARS, TIES, AND STIRRUPS:

- A. Materials:
  - 1. Conform to ASTM A615, Grade 60, except as otherwise specified.
  - 2. Cold-drawn wire for spiral column ties shall conform to ASTM A82.
  - 3. Reinforcement indicated or specified to be welded shall conform to ASTM A706.
- B. Fabrication of Bars:
  - 1. Fabricate with cold bends conforming to the recommended dimensions shown in ACI 318.
  - 2. Fabricate bars according to the tolerances given in ACI 117.
  - 3. Field fabrication will be allowed only if Contractor has equipment to properly fabricate steel.
  - 4. Attach metal or plastic tags with identifying mark or length corresponding to mark number or length on Drawing. Straight bars shall have mark number or size and length. Bent bars shall have mark number.
  - 5. Contractor may, at his option, continue steel reinforcement through openings in walls and slabs, then field-cut the opening so that there will be the required concrete cover between ends of bars and edge of opening.

2.02 WELDED WIRE REINFORCEMENT:

- A. Conform to ASTM 1064.
- B. Wire sizes W1.4 and smaller shall be galvanized.
- C. Provide mats only. Rolled fabric is not acceptable.

2.03 BOLSTERS, CHAIRS, AND ACCESSORIES:

- A. Conform to ACI SP 66 and the CRSI Manual of Standard Practice.
- B. Provide all spacers, bolsters, chairs, ties, and other devices necessary to properly space, place, support, and fasten steel reinforcement in place during the concrete placement.
- C. Metal accessories shall be galvanized or plastic-coated where legs will be exposed in finished concrete surfaces.
- D. Do not use rocks, broken bricks, wood blocks, or concrete fragments for support of steel reinforcement.

2.04 PRECAST CONCRETE BLOCK BAR SUPPORTS:

- A. May be used only for bar supports in slabs on ground.
- B. Conform to ACI SP-66 and the CRSI Manual of Standard Practice.
- C. Each block shall have a minimum of 9 square inches of bearing area. Space as required by the particular condition of weight, bearing surface, and rigidity of the steel reinforcement.

PART 3 - EXECUTION

3.01 PLACEMENT OF STEEL REINFORCEMENT:

- A. Place all steel reinforcement before concrete is cast in accordance with approved erection drawings, ACI 117, ACI 318, and the CRSI Manual of Standard Practice.

SECTION 03 20 00 – CONCRETE REINFORCEMENT: continued

- B. Remove oil, mill scale, pitting, mud, loose rust, ice, and other materials that would reduce bond from bars before placing.
- C. Tie securely with 16 gage (1.6 mm) or larger annealed iron wire.
- D. Place to maintain concrete cover to conform to ACI 117 and ACI 318, unless otherwise indicated.
- E. Splice steel where indicated. Splices shall be in full contact and shall conform to ACI 318.
  - 1. Unless otherwise indicated, lap splices shall be Class B as defined by ACI 318.
  - 2. Splice steel using Cadweld Series T-splices where indicated or approved.
    - a. Provide a manufacturer's representative to give on site instructions to all welders who will perform the splices in the field.
    - b. Contractor shall have the manufacturer's representative instruct, observe, and approve in writing those persons doing the welding.
    - c. Contractor shall arrange for the manufacturer's representative to return at the request of the Engineer.
  - 3. Lenton Mechanical Splices:
    - a. Lenton mechanical splices shall be used where indicated.
    - b. The Lenton mechanical splices shall develop in tension and compression at least 125% of the yield strength ( $F_y$ ) of the bar spliced.
    - c. Lenton mechanical splices shall be positive locking, taper threaded type coupler.
  - 4. Any additional Contractor-proposed splice shall be submitted for acceptance of location and splice length.
- F. Lap welded wire reinforcement in accordance with of ACI 318, but not less than the length of one mesh plus 2 inches (50 mm).
- G. Connection of reinforcement bars to steel shapes or plate shall be with a Cadweld Series B-splice.
- H. Do not bend bars embedded in hardened or partially hardened concrete without approval from Engineer. If bending is permitted, conform to procedures of ACI 301 unless otherwise prescribed by the governing building code.
- I. Do not weld reinforcing bars unless specifically indicated. Where welding is indicated, provide bars conforming to ASTM A706/A706M and comply with AWS D1.4.
- J. Reinforcement shall be placed and tied prior to pouring concrete. Reinforcement bars shall not be inserted or otherwise adjusted after concrete has been placed.

END OF SECTION 03 20 00

## SECTION 03 30 00 – CONCRETE

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes concrete for the interior and exterior on grade slabs and structures. The concrete for the tank construction is covered in specification 33 16 11.

#### 1.02 RELATED REQUIREMENTS:

- A. SECTION 03 10 00 – CONCRETE FORMWORK.
- B. SECTION 03 20 00 – CONCRETE REINFORCEMENT.
- C. SECTION 09 90 00 - PROTECTIVE COATINGS.
- D. SECTION 33 16 11 – COMPOSITE ELEVATED WATER STORAGE TANKS.

#### 1.03 REFERENCE STANDARDS:

- A. Comply with the provisions of the following codes, specifications, and standards, except as otherwise indicated.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
  - 1. American Concrete Institute (ACI):
    - a. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
    - b. ACI 301 - Specifications for Structural Concrete.
    - c. ACI 302.1R - Guide for Concrete Floor and Slab Construction.
    - d. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
    - e. ACI 305R – Guide to Hot Weather Concreting.
    - f. ACI 306R – Guide to Cold Weather Concreting.
    - g. ACI 308.1 - Specification for Curing Concrete.
    - h. ACI 309R - Guide for Consolidation of Concrete.
    - i. ACI 313 - Standard Practice for Design and Construction of Concrete Silos and Stacking Tubes for Storing Granular Materials.
    - j. ACI 318 - Building Code Requirements for Structural Concrete.
    - k. ACI 506R - Guide to Shotcrete.
    - l. ACI 506.2 - Specification for Shotcrete.
  - 2. ASTM International (ASTM):
    - a. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
    - b. ASTM C31/C31M REV A – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
    - c. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
    - d. ASTM C39/C39M – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
    - e. ASTM C40/C40M – Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
    - f. ASTM C42/C42M – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
    - g. ASTM C78/C78M REV B - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
    - h. ASTM C88 – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
    - i. ASTM C94/C94M – Standard Specification for Ready-Mixed Concrete.

SECTION 03 30 00 – CONCRETE: continued

- j. ASTM C114 – Standard Test Methods for Chemical Analysis of Hydraulic Cement.
- k. ASTM C117 – Standard Test Method for Material Finer than 75 $\mu$  (No. 200) Sieve in Mineral Aggregates by Washing.
- l. ASTM C136/C136M – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- m. ASTM C142/C142M – Standard Test Method for Clay Lumps and Friable Particles in Aggregates.
- n. ASTM C143/C143M REV A – Standard Test Method for Slump of Hydraulic Cement Concrete.
- o. ASTM C150/C150M – Standard Specification for Portland Cement.
- p. ASTM C172/AC172M REV A – Standard Practice for Sampling Freshly Mixed Concrete.
- q. ASTM C192/C192M – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
- r. ASTM C231/C231M – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- s. ASTM C233/C233M - Standard Test Methods for Air-Entraining Admixtures for Concrete.
- t. ASTM C260/C260M REVA – Standard Specification for Air-Entraining Admixtures for Concrete.
- u. ASTM C295/C295M – Standard Guide for Petrographic Examination of Aggregates for Concrete.
- v. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- w. ASTM C430 – Standard Test Method for Fineness of Hydraulic Cement by the 45 $\mu$  (No. 325) Sieve.
- x. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
- y. ASTM C566 –Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying.
- z. ASTM C595/C595M - Standard Specification for Blended Hydraulic Cements.
- aa. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- bb. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- cc. ASTM C1107/C1107M REVA - Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink).
- dd. ASTM C1193 – Standard Guide for Use of Joint Sealants.
- ee. ASTM C1218/C1218M - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
- ff. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
- gg. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction. (Nonextruding and Resilient Bituminous Types).
- hh. ASTM D1752 REVA - Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- ii. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

SECTION 03 30 00 – CONCRETE: continued

- jj. ASTM E1155M – Standard Test Method for Determining  $F_F$  Floor Flatness and  $F_L$  Floor Levelness Numbers (Metric).
- 3. Concrete Plant Manufacturers Bureau (CPMB):
  - a. 100 - Concrete Plant Standards.
  - b. 102 - Recommended Guide Specifications for Batching Equipment and Control Systems in Concrete Batch Plants.
- 4. Plant Mixer Manufacturers Division (PMMD):
  - a. 100 - Concrete Plant Mixer Standards.
- 5. Federal Specification (FS):
  - a. SS-S-200 - Sealants, Joint: Two-Component, Jet-Blast-Resistant, Cold-Applied, for Portland Cement Concrete Pavement.
  - b. TT-S-227 - Sealing Compound: Elastomeric Type, Multi-Component (for Calking, Sealing, and Glazing in Buildings and Other Structures).
- 6. National Bureau of Standards (NBS) Specifications for Scales.
- 7. Truck Mixer Manufacturers Bureau (TMMB):
  - a. Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards.

1.04 SUBMITTALS:

- A. Submit as specified in Division 01.
- B. Include, but not limited to, product data and Shop Drawings of the following:
  - 1. Nonshrink grouts.
  - 2. Admixtures.
  - 3. Bonding agents.
  - 4. Curing agents.
  - 5. Expansion joint materials.
  - 6. Joint sealants.
- C. Mill Certificates:
  - 1. Submit to Engineer a minimum of one copy for each cement shipment.
- D. Concrete Mix Design Proportions:
  - 1. Submit as specified in PART 2, Paragraph 2.01.D. - Mix Proportions, this Section.
  - 2. Submit for each mix design, including aggregate gradation data.
  - 3. Resubmit for any change in each mix design.
- E. Production Test Reports: Submit as specified in Division 01 and PART 2, Paragraph 2.01.E. - Measurement of Materials, this Section.

1.05 QUALITY ASSURANCE:

- A. Field Testing: Shall be performed by an ACI Concrete Field Testing Technician Grade 1.
- B. Submit qualification records of field testing and finishing technicians prior to placing concrete.

PART 2 - PRODUCTS

2.01 CONCRETE:

- A. Materials:
  - 1. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
    - a. Portland cement: ASTM C150, Type I/II. Supplement with the following:
      - (1) Fly ash: ASTM C618, Class F or C. Class C fly ash shall have a Dunstan ratio no greater than 3.0. The Dunstan Ratio (R) shall be defined as  $(CaO - 5)/Fe_2O_3$  expressed as a percent.

SECTION 03 30 00 – CONCRETE: continued

- (2) Total cementitious materials shall not contain more than between 15% to 25% pozzolan.
  - b. The maximum amount retained on the No. 325 sieve shall be 10% as determined in accordance with ASTM C430.
  - c. The maximum amount of alkalis ( $\text{Na}_2\text{O} + 0.658 \text{K}_2\text{O}$ ) shall be 0.60% determined in accordance with ASTM C114. A running average of three Samples shall not exceed a maximum of 0.50%.
2. Fine Aggregate:
- a. Conform to ASTM C33, except deleterious substances shall not exceed (by weight):
    - (1) Clay Lumps: 0.25%.
    - (2) Material Finer than No. 200 (75 $\mu$ ) Sieve: 2.0%.
    - (3) Coal and Lignite: 0.25% except use sand containing not more than 0.05% coal and lignite when used in concrete for finished floor surfaces.
    - (4) Other Deleterious Substances: 0.25%.
  - b. Approved service record of 3 years with a history indicating that the fine aggregate is not chemically reactive.
  - c. For a new fine aggregate source, or when 3 years' approved service records are not available, or when the service records are unacceptable; the aggregate shall be evaluated for potential reactivity. Aggregate must be considered innocuous in accordance with petrographic examination by ASTM C295.
  - d. Fine aggregate considered deleterious or potentially deleterious shall not be used without approval.
  - e. Maintain fine aggregate free of ice and frozen lumps.
  - f. Fineness modulus shall be between 2.3 and 3.1.
3. Coarse Aggregate:
- a. Conform to ASTM C33 except deleterious substances shall not exceed the following percentages (by weight):
    - (1) Clay lumps and friable particles..... 1.0.
    - (2) Shale or shale-like material..... 1.0.
    - (3) Coal and lignite..... 0.05.
    - (4) Material finer than No. 200 sieve..... 1.5.
    - (5) Sum of all deleterious material..... 3.0.
  - b. Approved service record of 3 years with a history indicating that the coarse aggregate is not chemically reactive.
  - c. For a new coarse-aggregate source, when 3 years' approved service records are not available, or when the service records are unacceptable; the aggregate shall be evaluated for potential reactivity. Aggregate must be considered innocuous in accordance with petrographic examination by ASTM C295 and tests conforming to ASTM C1260.
  - d. Coarse aggregate considered deleterious or potentially deleterious shall not be used without approval.
  - e. Blast furnace slag will not be permitted.
  - f. Maintain coarse aggregate free of ice and frozen lumps.
  - g. Grading Requirements:
    - (1) Size No. 57, from 1-inch (25-mm) to No. 4 (4.75-mm) sieve for all concrete unless otherwise specified.
4. Mixing Water:
- a. Only potable water will be acceptable.

SECTION 03 30 00 – CONCRETE: continued

5. Admixtures:
  - a. Water-Reducing Type:
    - (1) Conform to ASTM C494, Type A or Type D.
    - (2) Conform to manufacturer's recommendations for use.
    - (3) Technical assistance of the manufacturer's field representative shall be furnished upon request.
  - b. Air-Entraining Type:
    - (1) Conform to ASTM C260.
    - (2) Conform to manufacturer's recommendations for use.
    - (3) Technical assistance of the manufacturer's field representative shall be furnished upon request.
    - (4) Testing of air-entraining admixtures shall conform to ASTM C233.
  - c. Admixtures shall not contain any chloride ions.
  - d. Storage: Admixtures shall be stored in such a manner as to avoid contamination, evaporation, freezing, temperature changes, settling, or any damage which would adversely affect their characteristics.
- B. Laboratory Testing of Materials for Use in Concrete:
  1. An approved independent testing laboratory shall be selected and paid by Contractor to perform all required laboratory tests of materials proposed for use in the production of concrete and to determine mix proportions when laboratory trial batches are required.
  2. Contractor shall deliver representative Samples of all proposed concrete materials to the laboratory for the following testing:
    - a. Fine Aggregate:
      - (1) ASTM C33 (as amended by PART 2, Paragraph 2.01.A. - Materials, this Section).
      - (2) ASTM C40.
      - (3) ASTM C88.
      - (4) ASTM C117.
      - (5) ASTM C136.
      - (6) ASTM C142.
      - (7) Fineness modulus.
      - (8) ASTM C295 and ASTM C1260 or approved service records.
    - b. Coarse Aggregate:
      - (1) ASTM C33 (as amended by PART 2, Paragraph 2.01.A. - Materials, this Section).
      - (2) ASTM C88.
      - (3) ASTM C136.
      - (4) ASTM C142.
      - (5) ASTM C295 and ASTM C1260 or approved service records.
    - c. Air-entraining admixture shall be tested conforming to ASTM C233.
  3. The laboratory test results shall be part of the design mix submittal specified in this PART 2, Paragraph 2.01.D. - Mix Proportions.
- C. Concrete Qualities Required:
  1. Compressive Strength:
    - a. Minimum 28-day compressive strength = 4,000 psi for all construction unless otherwise indicated.
    - b. Minimum 28-day compressive strength = 2,000 psi for fill concrete.

SECTION 03 30 00 – CONCRETE: continued

- c. Compressive-strength determinations shall be made from 4-inch diameter by 8-inch long or 6-inch diameter by 12-inch long concrete cylinders tested in accordance with ASTM C39.
  2. Slump of concrete shall be between 2 inches and 4 inches as tested in accordance with ASTM C143 excluding water-reducing admixtures. Slump of concrete shall not exceed 8 inches including the effects of all admixtures.
  3. Air Content:
    - a. 6% ±1.5% unless otherwise indicated or specified.
    - b. 3% maximum for all concrete receiving steel-troweled finish.
    - c. Testing shall be in accordance with ASTM C231.
  4. Water-Cementitious Materials Ratio:
    - a. In addition to the aforementioned requirements, maximum water-cementitious materials ratio shall be limited as follows:
      - (1) 0.42 for all concrete unless otherwise specified.
  5. Chloride Ion Content:
    - a. Maximum water-soluble chloride ion content, in percent by weight of cement:
      - (1) 0.30 for all concrete unless otherwise specified.
    - b. Testing shall be in accordance with ASTM C1218.
- D. Mix Proportions:
  1. Concrete shall be homogeneous, readily placeable, uniformly workable, and finishable; proportioned to conform to ACI 211.1.
  2. Mix proportions for all concrete, unless otherwise specified, shall be selected preferably on the basis of field experience; but in the case where sufficient or suitable strength test data is not available, concrete shall be proportioned on the basis of laboratory trial mix design.
    - a. Field experience using test results within the preceding year, with the materials and plant to be employed may be the basis of mix proportioning, provided that not less than 30 consecutive satisfactory compressive-strength tests on concrete using the proposed materials with a similar mix are available. A compressive-strength test is defined as the average 28-day compressive strength of two 6-inch by 12-in three 4-inch by 8-inch companion cylinders or made conforming to ASTM C172 and ASTM C31 and tested conforming to ASTM C39.
      - (1) The standard deviation of compressive-strength tests shall be computed as a basis for design of the mix. The design average compressive strength shall exceed the specified strength by at least:
        - (a) 400 psi if standard deviation is less than 300 psi.
        - (b) 550 psi if standard deviation is 300 to 400 psi.
        - (c) 700 psi if standard deviation is 400 to 500 psi.
        - (d) 900 psi if standard deviation is 500 to 600 psi.
        - (e) 1,200 psi if standard deviation is greater than 600 psi .
      - (2) Submit the following test data to Engineer for approval prior to placing concrete:
        - (a) Fine Aggregate:
          - 1). ASTM C33.
          - 2). ASTM C40.
          - 3). ASTM C88.
          - 4). ASTM C117.
          - 5). ASTM C136.
          - 6). ASTM C142.

SECTION 03 30 00 – CONCRETE: continued

- 7). Fineness modulus.
  - 8). ASTM C295 and ASTM C1260 or approved service records.
  - (b) Coarse Aggregate:
    - 1). ASTM C33.
    - 2). ASTM C88.
    - 3). ASTM C136.
    - 4). ASTM C142.
    - 5). ASTM C295 and ASTM C1260 or approved service records.
  - (c) Cement:
    - 1). Mill certificate.
    - 2). ASTM C430.
  - (d) Concrete:
    - 1). Fine and coarse aggregate, water and cement sources.
    - 2). Mix proportions, slump and air content.
    - 3). Data on 30 consecutive satisfactory compressive strength tests and standard deviation calculations.
- b. Laboratory Trial Batch: When laboratory trial batches are used as a basis for determining mix proportions, all such Work shall be performed by the laboratory as specified in PART 2, Paragraph 2.01.B. - Laboratory Testing of Materials for Use in Concrete, this Section.
- (1) Laboratory trial batches shall be used to establish a water-cement ratio, compression-strength curve with at least three points, each representing the strength of a separate trial batch. At least one point shall be above and one below the strength required. Each point on the curve shall represent the average of at least three cylinders tested at 28 days or an earlier age when approved by Engineer. The slump and air content shall be at the maximum limits specified in PART 2, Paragraph 2.01.C. - Concrete Qualities Required, this Section.
  - (2) A point on the water-cement ratio, compressive-strength curve shall be selected that will provide an average compressive strength at least 1,200 psi greater than the specified minimum strength.
  - (3) Submit the following test data to Engineer for approval prior to placing concrete.
    - (a) Fine Aggregate:
      - 1). ASTM C33.
      - 2). ASTM C40.
      - 3). ASTM C88.
      - 4). ASTM C117.
      - 5). ASTM C136.
      - 6). ASTM C142.
      - 7). Fineness modulus.
      - 8). ASTM C295 and ASTM C1260 or approved service records.
    - (b) Coarse Aggregate:
      - 1). ASTM C33.
      - 2). ASTM C88.
      - 3). ASTM C136.
      - 4). ASTM C142.
      - 5). ASTM C295 and ASTM C1260 or approved service records.
    - (c) Cement:

SECTION 03 30 00 – CONCRETE: continued

- 1). Mill certificate.
- 2). ASTM C430.
- (d) Concrete:
  - 1). Fine and coarse aggregate, water and cement sources.
  - 2). Laboratory mix proportions, slump and air content.
  - 3). Water-cement ratio, compressive-strength curve.
  - 4). ASTM C1218.
3. Prior to placing any concrete, the laboratory selected by Contractor shall report the results of the testing and mix designs to the following:
  - a. Engineer, Kansas City Office (one copy).
  - b. Resident Project Representative, Field Office (one copy).
  - c. Contractor (copies as required).
  - d. Concrete Supplier (copies as required).
- E. Measurement of Materials:
  1. General Requirements:
    - a. Conform to ACI 304R.
    - b. Beam or springless dial-type scale conforming with NBS - "Specifications for Scales."
    - c. Volumetric measurement of water shall be performed with an approved automatic valve.
  2. Concrete Plant Scale Accuracy and Calibration Frequency:
    - a. The concrete plant scales shall be accurate to  $\pm 0.4\%$  of the capacity of the scale.
    - b. The scales shall be calibrated at intervals as specified in PART 3, Article 3.09 - Testing, this Section.
  3. Individual Batch Accuracy:
    - a. Cement:  $\pm 1.0\%$ .
    - b. Water:  $\pm 1.0\%$  by volume or weight.
    - c. Aggregates:  $\pm 2.0\%$ .
    - d. Admixtures:  $\pm 3.0\%$  by volume or weight.
    - e. Fly Ash:  $\pm 1.0\%$ .
- F. Mixing and Delivery:
  1. Conform to ACI 304R.
  2. Cement temperature, when added to mix, shall not exceed 170°F (77°C).
  3. Adjust the amount of mix water to compensate for the moisture content of the aggregates.
  4. Concrete Plant:
    - a. Conform to "Concrete Plant Mixer Standards" of the Plant Mixer Manufacturers Division, Concrete Plant Manufacturers Bureau, and "Concrete Plant Standards" of the Concrete Plant Manufacturers Bureau.
    - b. Charge with 5% to 10% of the mixing water both in advance and after the addition of aggregates and cement.
    - c. Charge with remaining water uniformly with the other materials.
    - d. Avoid charging in excess of manufacturer's rating.
    - e. Discharge mixed concrete completely prior to recharging.
    - f. Mixing Time:
      - (1) Start immediately when all ingredients, except the last of the water, are in the mixer.
      - (2) Minimum mixing time shall conform with mixer manufacturer's instructions, but not be less than the following:

SECTION 03 30 00 – CONCRETE: continued

Capacity of Mixer Cubic Yards	Minimum Time of Mixing
1 or less.....	1 minute
2.....	1 minute, 15 seconds
3.....	1 minute, 30 seconds
4.....	1 minute, 45 seconds
5.....	2 minutes
6.....	2 minutes, 15 seconds

Add 15 seconds' mixing time for each additional cubic yard of concrete.

5. Mixing of Concrete at Plant Off Jobsite:
  - a. Mix concrete in central mixer or truck mixer. Transport in truck mixer turning at agitation speeds only.
  - b. Water added to concrete having a slump below the specified minimum shall be at Contractor's risk. If the water added produces a slump greater than the specified maximum, the concrete will be rejected. If water is added, the concrete shall be remixed for a minimum of 25 revolutions. Water shall not be added after the truck mixer has begun to discharge concrete.
  - c. Truck mixer shall conform to "Truck Mixer, Agitator, and Front Discharge Concrete Carrier Standards" of the Truck Mixer Manufacturers Bureau.
  - d. Ready-mixed concrete shall be produced and delivered conforming to ASTM C94 as applicable.
  - e. Contractor shall furnish Owner with a concrete delivery ticket for each load of concrete. The ticket shall have the following information recorded:
    - (1) Serial number of ticket.
    - (2) Time batched.
    - (3) Time arrived on jobsite.
    - (4) Amount of concrete (by volume).
    - (5) Mix number.
    - (6) Amount of all water added at jobsite by Contractor.
    - (7) Name of ready-mix batch plant.
    - (8) Date.
    - (9) Truck number.
    - (10) Name of purchaser.
6. Plant and truck mixer uniformity shall be tested according to ASTM C94. Frequency of tests shall be as specified in PART 3, this Section.

2.02 GROUT:

- A. Grout for Dry Packing:
  1. Volume: 1 part Portland cement to 2 parts sand.
  2. Keep water to a minimum as required for placing by the dry packing method.
  3. Place after the mixed grout has been allowed to stand for 2 hours.
  4. The sand and cement shall be as specified for concrete.
- B. Flowable Nonshrinking Grout:
  1. Required for setting handrail posts, for setting equipment recommended by the manufacturer to be set with nonshrinking grout, and in other places indicated.
  2. Grout shall be nonmetallic and conform to ASTM C1107.
  3. Prepare and place conforming to manufacturer's printed instructions.

SECTION 03 30 00 – CONCRETE: continued

4. For equipment bases, the concrete surfaces shall be grit blasted or roughened with a chipping hammer prior to grouting. The foundation plates shall be cleaned of any grease, oil, paint, primers, or epoxy coatings.
- C. Grout for Bonding:
1. Proportion (by weight): 1 part cement to 1-1/2 parts sand.
  2. Keep water to a minimum.
- 2.03 BONDING AGENT:
- A. Provide moisture-insensitive, epoxy-resin bonding agent conforming to ASTM C881, Type V.
- 2.04 CONCRETE ACCESSORIES:
- A. Expansion Joints:
1. Expansion Joint Filler: Premolded cork of thickness indicated and conforming to ASTM D1752, Type III, self-expanding cork. Unless indicated to be asphalt-impregnated fiber.
  2. Expansion Joint Filler: Preformed asphalt-impregnated fiber of thickness indicated and conforming to ASTM D1751. Use where indicated.
  3. Bond Breaker: Polyethylene tape or other plastic tape as recommended by sealant manufacturer.
  4. Sealant Backer Rod: Provide closed cell backer rod or other backing material as recommended by sealant manufacturer.
  5. Joint Sealants:
    - a. Multi-component sealant as follows:
      - (1) Joint Sealant - General Use:
        - (a) BASF Building Systems: Sonneborn Sonolastic NP 2 (vertical use) and Sonolastic SL 2 (horizontal use).
        - (b) Epoxy Systems Products Company: Product #11.
        - (c) Euclid Chemical Company: Eucolastic II.
        - (d) Pecora Corporation: NR-200, Dynatred.
      - (2) Joint Sealant - Potable Water Treatment and Storage Facilities:
        - (a) Sika Corporation: Sikaflex-2c NS.
        - (b) All sealants used at the West Reservoir shall be NSF 61 product certified. Include NSF 61 product certification with submittal.
- 2.05 CURING AGENT:
- A. Apply to all concrete surfaces unless otherwise indicated or specified.
- B. Curing agent shall conform as follows:
1. ASTM C309, Type 1: Use where concrete surface is not exposed to direct sunlight after placement.
  2. ASTM C309, Type 1-D: Use where slabs are exposed to direct sunlight for a period of seven days minimum after placement. Curing and sealing agent with fugitive dye shall be readily distinguishable upon the concrete surface for at least four hours after application but shall be inconspicuous within seven days after application.
  3. ASTM C309, Type 2: Use as specified in PART 3, Article 3.05 - Hot Weather Concreting, this Section.
- C. Curing compound used on floors to be sealed, painted, tiled, topped, dampproofed, waterproofed, or covered with resilient floor covering shall be guaranteed not to interfere with application of sealer, paint, tile mortar, or tile adhesive after a 28-day curing period.
- D. Curing compound shall be VOC compliant with a maximum VOC content of 2.9 lbs./gal (350 g/L), or less where Project location regulations are more stringent.

SECTION 03 30 00 – CONCRETE: continued

2.06 CONCRETE FLOOR CURING AND SEALING AGENT:

- A. Apply to all interior concrete floor surfaces.
- B. Curing and sealing agent shall conform as follows:
  - 1. ASTM C1315, Type I, Class A: Use where slabs are not exposed to direct sunlight after placement.
  - 2. ASTM C1315, Type I, Class A with Fugitive Dye: Use where slabs are exposed to direct sunlight for a period of seven days minimum after placement. Curing and sealing agent with fugitive dye shall be readily distinguishable upon the concrete surface for at least four hours after application but shall be inconspicuous within seven days after application.
  - 3. ASTM C1315, Type II, Class A: Use as specified in PART 3, Article 3.05 - Hot Weather Concreting, this Section.
- C. Apply as soon as possible and in conformance with manufacturer's written instructions.

PART 3 - EXECUTION

3.01 PREPARATION FOR CONCRETE PLACEMENT:

- A. Openings Through Concrete: Provide openings through concrete as indicated and for the proper installation of all equipment, piping, wiring, ductwork and similar items, installed under this Contract.
- B. Installation of Embedded Items:
  - 1. Provide for accurate installation of embedded items installed under this Contract.
  - 2. Securely fix floor drains in place to prevent flotation while placing concrete. Uniformly and accurately slope finish floor slab toward the drains.
  - 3. Embedded items shall be as indicated or specified, or as selected by Contractor and approved by Engineer.
  - 4. During cold weather, protect pipe sleeves, shear pockets, and blockouts from moisture which may freeze, expand, and crack the sleeve, pocket or blockout and concrete structure.
  - 5. Grease or tape anchor bolt threads to protect from concrete splatter.
- C. Installation of Joints:
  - 1. Construction Joints:
    - a. Location:
      - (1) Locate joints, which are not indicated or specified, in conformance with ACI 318.
      - (2) Locate joints to limit the length of all concrete placements to not more than 50 feet in any dimension.
      - (3) Obtain Engineer's approval of joints located by Contractor prior to preparation of reinforcing steel drawings.
    - b. Preparation and Installation:
      - (1) Clean and break laitance or other foreign material from bonding surface.
      - (2) Tighten forms remaining in place (where applicable) to prevent seepage between forms and hardened concrete.
      - (3) Provide waterstops and shear keys as indicated or specified and as required in any new construction joint requested by Contractor.
    - c. Waterstops:
      - (1) Install in all construction joints where indicated.

SECTION 03 30 00 – CONCRETE: continued

- (2) Install conforming to manufacturer's printed instructions. All joints and splices of PVC waterstop shall be 100% fused. Use thermostatically controlled splicing iron as recommended by manufacturer.
2. Expansion Joints:
  - a. Install filler, backer rod and sealant in strict conformance with manufacturer's written instructions.
  - b. Reinforcing steel shall not extend through expansion joints unless indicated otherwise.
  - c. Attach rigid joint filler to the face of the joint prior to placing adjacent concrete. The filler shall occupy the entire width of the joint.
  - d. Install sealant backer rod for sealant except where indicated to be omitted. Install bond breaker where indicated.
  - e. Clean joints surfaces immediately before application of sealant.
  - f. Install joint sealants to conform to ASTM C1193. Tool sealants to provide smooth, uniform bead with a slightly concave surface, eliminate air pockets, and insure sealant contact and adhesion with sides of joint.
  - g. Protect joints from moisture and ice during freezing.
- D. Cutting and Bonding to Existing Concrete:
  1. Cutting Existing Concrete:
    - a. Use methods and equipment that will avoid damage to adjacent parts of the structure from heavy blows or vibration.
    - b. Cut existing concrete with power concrete saw where possible to prevent spalling and chipping and to form neat, straight edge.
    - c. Remove all loose or cracked concrete resulting from cutting existing concrete, leaving only sound, undamaged concrete adjacent to new Work.
    - d. Leave access opening edges with a neat, true grout surface to the opening size indicated.
    - e. Cut reinforcing steel with sufficient length remaining (approximately 38 bar diameters) for bending and lapping into new construction.
  2. Bonding to Existing Concrete:
    - a. Roughen concrete to 1/4-inch (6-mm) amplitude by use of a pneumatic chipping hammer or other approved means.
    - b. Thoroughly clean the concrete surface and apply the bonding agent in accordance with manufacturer's written instructions.

3.02 PLACING OF CONCRETE:

- A. Conventional Placing:
  1. General Requirements:
    - a. Conform to ACI 304R.
    - b. Bonding surfaces, including reinforcement, shall be clean, free of laitance and foreign materials.
    - c. Face horizontal bonding surfaces with 1-inch thick coat of fresh "grout for bonding." Wet all other surfaces.
    - d. Place concrete on properly prepared and unfrozen subgrade and only in dewatered excavation and forms.
    - e. Use forms for all concrete except where otherwise indicated or specified.
    - f. Do not place concrete that has partially hardened or has been contaminated by foreign materials.



SECTION 03 30 00 – CONCRETE: continued

3. Take special precautions to avoid bending or displacing waterstop while placing concrete around it.
4. Delay construction at a joint a minimum of 16 hours where placement is continued past joint, except where otherwise indicated.

3.03 FINISHING:

A. Unformed Surfaces:

1. Screed Finish:
  - a. Use as first stage for all concrete finishes.
  - b. Use as final finish on surfaces that will be covered by additional concrete, grout placement, or mortar setting bed except as otherwise specified.
  - c. Immediately after screeding, use a wood float, darby, or bullfloat to eliminate high and low spots and to embed large aggregate. This shall be done in a manner to produce even, uniform surfaces so that surface irregularities do not exceed 3/8 inch in 10 feet when used as final finish.
2. Floated Finish:
  - a. Use as second stage of broomed, troweled, or magnesium-troweled finish.
  - b. Float with mechanical float. Hand floating will be permitted only in areas inaccessible to mechanical float.
  - c. On surfaces not to receive troweled or magnesium-troweled finish, finish with wood or cork float after mechanical floating to a true uniform surface so that surface irregularities do not exceed 1/8 inch in 10 feet, except at floor drains.
3. Broomed Finish:
  - a. Use as final finish on all outdoor slabs including pavements, and sidewalks.
  - b. After floated finish, draw a stiff bristle broom across the surface making uniform corrugations, perpendicular to the direction of traffic, not more than 1/16 inch deep.
4. Troweled Finish:
  - a. Use as final finish on inside floors and on all other unformed surfaces not otherwise indicated or specified.
  - b. Trowel with mechanical steel trowel to obtain a smooth, dense finish. Hand steel trowel shall be used in areas not accessible by mechanical trowel. The final troweling shall be done after the concrete has become hard enough so that no mortar adheres to the edge of trowel and a ringing sound is produced as the trowel passes over the surface.
  - c. Do not trowel before surface water has evaporated or has been removed with a squeegee.
  - d. Finish to a true uniform surface so that surface irregularities do not exceed 1/8 inch in 10 feet, except at floor drains.
  - e. Do not add sand or cement to the floor surface.
5. Floor Flatness and Levelness:
  - a. Finish to a true uniform surface so that surface irregularities do not exceed 1/8 inch in 10 feet, except at floor drains.
  - b. All slabs not meeting the above minimum tolerance tests shall be removed and replaced at Contractor's expense.

B. Repair of Defective Surfaces:

1. Defined as any concrete surface showing misalignment, rock pockets, poor joints, holes from ties, voids, honeycomb, or any other defective area.
2. Repairing:
  - a. Repair as soon as forms have been removed.

SECTION 03 30 00 – CONCRETE: continued

- b. Chip surface back to minimum depth of 1/2 inch, chip edges perpendicular to surface, prewet depression and brush with neat cement immediately before patching.
- c. Patch surfaces using stiff mortar with same sand-cement ratio as original concrete and with minimum water for placing. Blend with white cement to match concrete color.
- d. Compact mortar into depressions so that after curing, hole is filled and mortar is flush with surface. Use hammer and ramming rod for compacting the holes.
- e. Moist-cure for 3 days or use curing compound.
- f. Engineer shall be notified of areas containing defects or where reinforcing steel is exposed, prior to determination of repair method.

3.04 CURING:

- A. Cure concrete by one of the following methods in accordance with ACI 308.1:
  - 1. Leaving in forms for a minimum of 7 days. Keep formwork wet to prevent drying of concrete surfaces.
  - 2. Using one coat of a liquid membrane forming compound as specified. Apply immediately after removal of forms (which have been continuously wet); or in case of a slab, after the concrete has been finished and is hardened sufficiently to walk on.
  - 3. Curing of concrete during hot or cold weather shall conform to PART 3 - Hot Weather Concreting and Cold Weather Concreting, this Section.

3.05 HOT WEATHER CONCRETING:

- A. Follow the recommendations of ACI 305R if any of the following conditions occur:
  - 1. When the temperature is 90°F or above.
  - 2. When the temperature is likely to rise above 90°F within the 24-hour period after concrete placement.
  - 3. When there is any combination of high air temperature, low relative humidity, and wind velocity which would impair either concrete strength or quality.
- B. Concrete shall have a maximum temperature of 85°F during placement.
- C. Dampen subgrade and forms with cool water immediately prior to placement of concrete.
- D. Protect freshly placed concrete immediately after placement so that the rate of evaporation as determined by ACI 305R (Figure 4.2) does not exceed 0.2 pound per square foot per hour.
- E. Protect concrete with suitable insulation if rapidly decreasing nighttime temperatures occur, which would cause thermal shock to concrete placed during warm daytime temperatures.
- F. Protect the concrete with temporary wet covering during any appreciable delay between placement and finishing.
- G. Begin curing unformed surfaces immediately after finishing and continue for 24 hours. Curing shall consist of application and maintenance of water-saturated material to all exposed surfaces; horizontal, vertical, and otherwise. After the 24-hour interval, continue curing using one of the following methods:
  - 1. Moist curing for 6 days.
  - 2. Application of one coat of curing compound as specified.
  - 3. Application and maintenance of curing paper or heat-reflecting plastic sheets for 6 more days.
- H. Begin curing formed concrete immediately after placing. Curing shall consist of keeping forms continuously wet for 24 hours. Thereafter, continue curing using one of the following methods:

SECTION 03 30 00 – CONCRETE: continued

1. Loosen forms and position soaker hose so that water runs down along concrete surfaces. Continue for 6 days.
  2. Strip forms and apply curing compound as specified. Do not allow concrete surfaces to dry prior to application of curing compound.
- 3.06 COLD WEATHER CONCRETING:
- A. When the temperature is 40°F or is likely to fall below 40°F during the 24-hour period after concrete placement, follow the recommendations of ACI 306R to prevent loss of concrete strength or quality.
  - B. Minimum temperature for concrete as mixed shall be as indicated on lines 2, 3, and 4 of Table 5.1 of ACI 306R. Maximum temperature for concrete as mixed shall be 10°F greater than the corresponding minimum temperature.
  - C. Place and maintain concrete so that its temperature is never less than the temperature indicated on line 1 of Table 5.1 of ACI 306R. Maintain the required temperature for the time duration indicated on Tables 5.1 and 7.1 of ACI 306R.
  - D. Monitor temperature of concrete in place at corners or edges of formwork as applicable.
  - E. Air Heaters:
    1. Do not expose concrete to carbon monoxide or carbon dioxide fumes from heaters or engines.
    2. Oil- or coke-burning salamanders will not be permitted.
    3. Heaters shall be ultramatic portable heaters made by the Union Chill Mat Company or Engineer approved equal.
    4. Personnel shall be present at all times to maintain safe, continuous operation of heating system.
  - F. Control temperature and humidity of protected concrete so that excessive drying of concrete surfaces does not occur.
  - G. Calcium chloride will not be permitted as a concrete accelerator or to thaw frozen subgrade prior to concrete placement.
  - H. The maximum allowable temperature drop during the first 24-hour period after protection is discontinued shall be as indicated on line 1 of Table 5.1 of ACI 306R.
  - I. Cure the concrete in accordance with Chapter 10 of ACI 306R.
- 3.07 LOW-STRENGTH CONCRETE:
- A. Low-Strength Concrete:
    1. Defined as either:
      - a. Concrete whose average, of any sets of three consecutive 28-day compressive strength tests, is below the required 28-day strength.
      - b. Concrete whose individual 28-day strength test (average of two 6-inch by 12-inch or three 4-inch by 8-inch cylinders) is more than 500 psi below the required 28-day strength.
    2. Should concrete meet either definition of low-strength concrete as a minimum, the Contractor shall take the following steps:
      - a. Increase the cement content. The increase shall be based on a statistical evaluation of the strength data, the design water-cement ratio, compressive-strength curve, and acceptable mix-design literature as follows:
        - (1) If sufficient concrete has been furnished to accumulate 30 tests, these should be used to establish a new target average strength in accordance with ACI 318, Section 5.3.

SECTION 03 30 00 – CONCRETE: continued

- (2) If less than 30 tests have been made, the new target average strength should be at least as great as the average strength used in the initial selection of the mix proportions. Increase the target average strength based on a statistical evaluation of the available strength data, the design water-cement ratio, compressive-strength curve, and acceptable mix-design literature. If the statistical average equals or exceeds the initial mix-design level, a further increase in the average level is required.
- b. Remove and replace with acceptable concrete when the quality and location of the low-strength concrete is such that Engineer considers the strength or durability of the structure is impaired and so orders.
3. Low-strength concrete shall be considered defective Work as defined in DOCUMENT 00700 – GENERAL CONDITIONS.
- B. Potentially Low-Strength Concrete: Defined as concrete whose 7-day test (average of two 6-inch cylinders or three 4-inch cylinders) is less than 70% of the specified minimum 28-day compressive strength.
- C. Construction delays caused by low-strength or potentially low-strength concrete shall not relieve Contractor from responsibility for late completion even though extensions of time may be granted.

3.08 MISCELLANEOUS CONCRETE ITEMS:

- A. Equipment Bases:
  1. Construct equipment bases, pads, and foundations as indicated or, when not indicated, conforming to equipment manufacturer's requirements.
  2. Reinforce conforming to typical detail unless otherwise indicated.
  3. Equipment bases shall include concrete, reinforcing steel, formwork as required, and anchor bolts. Place grout for equipment installed under this Contract.
  4. Finish top area of bases between anchor bolts and forms with a troweled finish.

3.09 TESTING:

- A. Field Testing of Concrete Plant and Mixing Trucks:
  1. The concrete plant shall be inspected and tested to ensure conformance with ACI 304R and the "Concrete Plant Standards of the Concrete Plant Manufacturers Bureau." The scales shall be calibrated at the initial setup and at 3-month intervals thereafter.
  2. Mixing trucks shall be inspected and tested to ensure conformance with ACI 304R and "Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers Bureau" of the National Ready-Mix Concrete Association. Tests shall be done at initial setup and every 3 months thereafter.
  3. Submit test reports when requested.
- B. Field Testing of Concrete and Making of Concrete Test Cylinders:
  1. Owner shall furnish test equipment, test cylinder molds, and certified personnel to perform all required field tests, make the required concrete test cylinders, and deliver test cylinders to the testing laboratory. Contractor shall coordinate testing schedule with Owner.
  2. Field testing personnel shall be on Site throughout placement of concrete.
  3. Concrete sampling for tests and cylinder making shall be done conforming to ASTM C172. Samples shall be taken at random and at the point of truck discharge.
  4. Perform the following tests:

SECTION 03 30 00 – CONCRETE: continued

- a. Prepare test cylinders conforming to ASTM C31, with not less than one set of cylinders (four 6-inch cylinders or six 4-inch cylinders) from each day's placement for each 100 cubic yards or fraction thereof.
  - b. Slump test conforming to ASTM C143. Perform tests on the first batch produced each day, for every 50 cubic yards or fraction thereafter, and with every set of test cylinders. Additional tests shall be run when directed by Engineer.
  - c. Air content test conforming to ASTM C231. Perform for first batch of day and with each set of test cylinders.
  - d. The batch of concrete being tested for slump or air content shall not be placed until acceptable results are obtained.
  - e. Discard concrete used for slump and air tests.
  - f. Perform concrete and air temperature tests for first batch of day and with each set of test cylinders. Additional readings shall be taken when directed by Engineer.
  - g. Any batch of concrete with slump or air content not in conformance with Specifications shall be rejected.
  - h. Furnish slump, air content, and temperature test results to the testing laboratory for inclusion in the cylinder test reports.
- C. Laboratory Testing of Concrete During Construction:
1. An independent testing laboratory shall be selected and paid by Owner to perform the required laboratory tests and statistical evaluations of aggregates and concrete being used in the Work.
    - a. Laboratory shall cure and test concrete cylinders conforming to ASTM C192 and C39, testing one set of cylinders at 7 days of age and one set at 28 days of age. A set of cylinders shall be two 6-inch cylinders or three 4-inch cylinders.
    - b. Engineer shall have the right to observe all phases of concrete cylinder curing and testing.
    - c. Should the test results indicate low strength concrete as defined in PART 3, Article 3.07 - Low-Strength Concrete, this Section, Contractor shall take immediate corrective action.
    - d. Should the material tests taken during construction indicate nonconformance with the Specifications, Contractor shall take immediate corrective action.

3.10 REPAIR, REPLACEMENT, AND FIELD MODIFICATIONS:

- A. Embedded items and concrete that are misplaced or damaged during construction shall not be repaired, replaced, or field-modified without approval of Engineer.

END OF SECTION 03 30 00

## DIVISION 07 – THERMAL AND MOISTURE PROTECTION

### SECTION 07 27 36 - SPRAYED FOAM INSULATING AIR BARRIER SYSTEM

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Section Includes:
  - 1. Walltite® US spray-applied closed cell polyurethane foam (ccSPF) air barrier system for exterior wall assemblies.
- B. Related Requirements:
  - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- C. Related Work Specified Elsewhere:
  - 1. SECTION 09 96 47 – SPRAY-APPLIED THERMAL BARRIER

##### 1.02 REFERENCES

- A. Reference Standards:
  - 1. Air Barrier Association of America (ABAA):
    - a. ABAA Quality Assurance Program
  - 2. ASTM International (ASTM):
    - a. ASTM C518-10, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
    - b. ASTM C1029-13, Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
    - c. ASTM C1177/C1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
    - d. ASTM C1325-08b, Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units
    - e. ASTM C1338-14, Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings
    - f. ASTM D1621-10, Standard Test Method of Compressive Properties of Rigid Cellular Plastics
    - g. ASTM D1622-08, Standard Test Method for Apparent Density of Rigid Cellular Plastics
    - h. ASTM D1623-09, Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
    - i. ASTM D4541-09e1, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
    - j. ASTM D6226-10, Standard Test Method for Open Cell Content of Rigid Cellular Plastics
    - k. ASTM E84-13a, Standard Test Method for Surface Burning Characteristics of Building Materials
    - l. ASTM E96/E96M-13, Standard Test Method for Water Vapor Transmission of Materials
    - m. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials
    - n. ASTM E2178-13, Standard Test Method for Air Permeance of Building Materials
    - o. ASTM E2357-11, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

3. California Department of Public Health (CDPH) Section 01350
    - a. CDPH Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, 2010
  4. Center for Polyurethane Insulation (CPI):
    - a. Health & Safety Training Course
  5. International Code Council-Evaluation Service (ICC-ES):
    - a. ICC-ES AC 377 Acceptance Criteria for Spray-Applied Foam Plastic Insulation
    - b. ICC-ES AC 71 Acceptance Criteria for Foam Plastic Sheathing Panels Used as Weather-resistive Barriers
    - c. ICC-ES AC 148 Acceptance Criteria for Flexible Flashing Materials
  6. National Fire Protection Association (NFPA):
    - a. NFPA 285 (2012), Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.
    - b. NFPA 259 (2013), Standard Test Method for Potential Heat of Building Materials
  7. Occupational Safety and Health Administration, U.S. Department of Labor (OSHA):
    - a. Health and Safety Practices for SPF Applications
  8. Spray Foam Coalition, of the Center for the Polyurethanes Industry (SFC):
    - a. Guidance on Best Practices for the Installation of Spray Polyurethane Foam
    - b. Ventilation Considerations for Spray Polyurethane Foam
  9. United States Environmental Protection Agency (EPA):
    - a. Ventilation Guidance for Spray Polyurethane Foam Application
  10. Underwriters Laboratories, Inc. (UL):
    - a. UL 263 - Fire Tests of Building Construction and Materials
    - b. UL 1715 - Fire Tests of Interior Finish Material
  11. UL Environment (ULe)
    - a. UL 2818 - GREENGUARD Certification Program for Chemical Emissions for Building Materials, finishes and Furnishings
    - b. UL 2821 - GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions for Building Materials, Finishes and Furnishings
- B. Other Organizations:
1. American Association for Laboratory Accreditation (AALA)
  2. International Accreditation Service Inc. (IAS)
  3. International Standards Organization (ISO)

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Pre-application Conference: Organize and convene a pre-application conference not less than 2 weeks prior to commencing Work of this Section.
1. Required Attendance: Contractor, architect, installer, air barrier manufacturer's product representatives, and representatives of related trades including covering materials, substrate materials and adjacent materials.
  2. Agenda:
    - a. Construction site safety relating to potential hazards or fire risks during application;
    - b. Materials approved for use and their compatibility;
    - c. Details of air barrier construction;
    - d. Coordination with substrate preparation;
    - e. Coordination with installation of adjacent and covering materials;

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

- f. Sequence of air barrier construction;
- g. Construction and testing of mock-up, and;
- h. Protection of completed air barrier installation.

1.04 ACTION SUBMITTALS

A. Submit in accordance with DIVISION 1:

- 1. Product Data: For each component of the air barrier system.
  - a. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; temperature and other limitations of installation conditions, and; tested physical and performance properties of products.
  - b. Installation instructions for each component of the air barrier system.
- 2. Shop Drawings:
  - a. Submit shop drawings showing locations and extent of air barrier assemblies and details of all typical conditions; intersections with other envelope assemblies and materials; membrane counter-flashings; details showing how gaps in the construction will be bridged; how inside and outside corners are negotiated; how materials that cover the air barrier are secured with air-tight condition maintained, and; how miscellaneous penetrations such as conduits, pipes, electric boxes and similar items are sealed.
  - b. Submit shop drawings of proposed mock-ups showing plans, elevations, large-scale details, and connections to the test apparatus.
- 3. Samples: Submit a clearly labeled sample prepared by the installer, of spray-applied polyurethane foam specified, 12 inches by 12 inches (300 mm by 300 mm) minimum size and approximately 3 inches (75 mm) thick, applied with a minimum of 2 passes and to a rigid back-up material such as plywood.
- 4. Certificates:
  - a. Copy of the SPF applicators ABAA certification
  - b. Include a statement that materials are compatible with adjacent material proposed for use.
  - c. Submit documentation from primary materials manufacturer indicating compatibility of products not manufactured by primary manufacturer.
  - d. Documentation confirming GREENGUARD Gold Certification or Documentation confirming compliance with CDPH Section 01350
- 5. Tests and Evaluation Reports:
  - a. Submit the manufacturers Corporate Sustainability Report (e.g. Global Reporting Initiative).
  - b. Submit research/evaluation report for foam plastic insulation from ICC-ES or equivalent.
  - c. Submit reports indicating that field peel-adhesion test on all materials to which sealants are adhered have been performed and the changes made, if required, to other approved materials, in order to achieve successful adhesion.
    - 1) Include recommended values for field adhesion test on each substrate.
- 6. Sample Warranty: Submit manufacturer's specimen warranty.

1.05 INFORMATIONAL SUBMITTALS

A. Submit in accordance with DIVISION 01:

- 1. Contractor Qualifications: Submit certificates of completion for all workers for CPI's Health and Safety Training Course.
- 2. Quality Assurance Program:

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

- a. Submit evidence of current accreditation and installer certification numbers for those assigned to this Project under ABAA's Quality Assurance Program, at time of bidding.
- b. Submit evidence of closed cell spray foam air barrier manufacturer's current approval as an ABAA evaluated material and assembly.

1.06 CLOSEOUT SUBMITTALS

- A. Submit in accordance with DIVISION 01:
  1. Warranty:
    - a. Submit manufacturer's executed written warranty against material defects.
    - b. Submit installer's executed written warranty against installation defects.

1.07 QUALITY ASSURANCE

- A. Comply with standards referenced in Article 1.2 - REFERENCES.
- B. Manufacturer:
  1. Obtain primary materials from a single manufacturer regularly engaged in manufacturing air barrier membranes and with a minimum of 10 years of experience manufacturing air barrier and insulation products utilized in non-residential building projects.
  2. Spray Foam System Compounder shall be a member of CPI and ISO 9001 Certified.
  3. Provide foam products which comply with applicable regulations controlling the use of volatile organic compounds (VOC), with a maximum VOC content less than 50 g/L.
- C. Installer Qualifications:
  1. Pre-bid accredited by ABAA and whose applicators are certified in accordance with the ABAA Quality Assurance Program.
  2. Completion of manufacturer's training program for installation of specified air barrier, and not less than 5 installations similar in size and complexity in the past 3 years, of which 3 have been completed by the crew assigned to the Project.
  3. Installers shall have their photo identification certification cards in their possession and available on the Project site, for inspection upon request.
- D. Accredited Laboratory Testing for Materials: Engage laboratory accredited by AALA or IAS for in-field mock-up testing, performance standards, and assembly tests listed in Article 2.2 – PERFORMANCE REQUIREMENTS and 2.3 CLOSED CELL SPRAY FOAM AIR BARRIER SYSTEM.
- E. Mock-Ups: General Contractor is responsible for coordinating the construction of the mock-up in accordance with Division 1 requirements, and as specified herein. Mock-ups shall be representative of primary exterior wall assemblies and acceptable to the Architect.
  1. Size: Approximately 8 feet long by 8 feet high (2.4 m long by 2.4 m high) including air barrier system components, back-up wall construction, glazing, and typical penetrations which make up the exterior wall assembly(ies).
  2. Testing:
    - a. Mock-Up Tests for Air and Water Infiltration: Test mock-up for air and water infiltration as prescribed by the Project requirements.
      - 1) Sequence: Perform the air leakage and water penetration tests of mock-up prior to installation of cladding and trim but after installation of all fasteners for cladding and trim and after installation of other penetrating elements.
      - 2) Deficiencies: If deficiencies are observed, reconstruct mock-up and retest until satisfactory results are obtained. Deficiencies include air leakage beyond limits specified for project requirements, uncontrolled water leakage, and unsatisfactory workmanship.

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

- b. Mock-Up Tests for Adhesion: Test mock-up of materials for adhesion and material compatibility in accordance with manufacturers' recommendations. Perform test after curing period recommended by the manufacturer. Record mode of failure and the area(s) which failed to meet the Project requirements of 16 psi when tested in accordance with the ASTM D4541 standard. When the air barrier material manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report shall indicate whether this requirement has been met.
- 3. Approval of mock-up(s) does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Architect specifically approves such deviations in writing.
- 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Architect or architect's representative to be alerted to product installation and is required to confirm installation before product is concealed

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, manufactured date, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier membrane manufacturer. Protect stored materials from direct sunlight.
- C. Handle materials in accordance with manufacturer's recommendations and applicable regulatory requirements.
- D. Remove empty containers, excess materials and debris from site as soon as possible for recycling or disposal in accordance with applicable local, state, and federal regulations.
  - 1. Follow applicable regulatory requirements for recycling and disposal of waste materials.

1.09 FIELD CONDITIONS

- A. Ambient Conditions:
  - 1. Temperature: Install air barrier and auxiliary materials to within range of ambient and substrate temperatures recommended by the air barrier system manufacturer.
    - a. Do not install spray foam when temperature is within 5 deg F (-15 deg C) of the dew point.
  - 2. Moisture: Do not apply air barrier to damp or wet substrates, including areas exposed to or contaminated by, snow, rain, fog, or mist.
  - 3. Ventilation: Provide adequate ventilation during application of air barrier in enclosed spaces. Maintain ventilation until foam products have cured.
    - a. Comply with OSHA, CPI/SFC, and EPA requirements specified in Article 1.02 - REFERENCES.
    - b. CPI/SFC Guidance document for ventilation considerations for SPF Application.
  - 4. Substrate: Substrates to receive the Spray foam air barrier material and other auxiliary materials are required to be clean, sound, and secure.

1.10 WARRANTY

- A. General: The Contractor shall warrant the sprayed foam air barrier to be free of defects in accordance with the General Conditions. This warranty shall be extended by the following manufacturer and installer warranties:
  - 1. Material Warranty: Provide manufacturer's warranty that all components of the sprayed foam air barrier system are free of defects in materials.

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

- a. Warranty Period: 3 years from Date of Substantial Completion of spray foam air barrier installation.
2. Installation Warranty: Provide installer's warranty that the sprayed foam air barrier installation is free of defects in workmanship, including all components of the sprayed foam air barrier manufacturer's air barrier assembly.
  - a. Warranty Period: 3 years from Date of Substantial Completion of spray foam air barrier installation.

PART 2 - PRODUCTS

2.01 AIR BARRIER MANUFACTURERS

- A. Acceptable Manufacturers:
  1. Spray Foam: BASF Corporation, 1703 Crosspoint Ave, Houston, TX 77054, Toll Free Tel: 1(800)706-0712, Email: [spfinfo@basf.com](mailto:spfinfo@basf.com), Web Site: [www.spf.basf.com](http://www.spf.basf.com)
  2. Transition Membrane: BASF Corporation, 889 Valley Park Drive, Shakopee, MN 55379, Toll Free Tel: 1(800)243-6739, Web Site: <https://www.master-builders-solutions.basf.us/en-us/contact>
- B. Or Engineer approved equal.

2.02 PERFORMANCE REQUIREMENTS

- A. Material Performance: Provide materials which have an air permeance not to exceed 0.04 cfm/sq.ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa) when tested in accordance with ASTM E2178.
- B. System Performance: Substantiate that air barrier material used as or in a system assembly, will have an air permeance not to exceed 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa) when tested in accordance with ASTM E 2357.
- C. Wall Assembly:
  1. Exterior wall assembly shall comply with NFPA 285.
  2. The wall must have a potential heat of 1961 BTU/ft<sup>2</sup> (22.3 MJ/m<sup>2</sup>) or less (per inch of thickness) when tested in accordance with NFPA 259.
  3. Fire Resistant Assemblies: If a fire- resistance rating is required for the wall assembly, then the wall must be tested in accordance with ASTM E 119 or UL 263 or have substantiation in the form of an Engineering Judgment based on results from tested assemblies.
- D. Connections to Adjacent Materials and Assemblies: Provide connections to prevent air leakage at the following locations:
  1. Foundation and walls, including penetrations, ties and anchors;
  2. walls and building fenestration e.g. doors, storefronts, windows, curtain walls, and louvers;
  3. dissimilar wall assemblies and fixed openings within those assemblies;
  4. wall and roof connections;
  5. floors over unconditioned space;
  6. walls, floor and roof across construction, control and expansion joints;
  7. utility, pipe, and duct penetrations;
  8. seismic and expansion and control joints, and;
  9. leakage pathways in the building envelope.

2.03 CLOSED CELL SPRAY FOAM AIR BARRIER SYSTEM

- A. Closed Cell Spray Polyurethane Foam Air Barrier System at Walls: "Walltite ® US", spray-

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

applied air barrier system, incorporating materials complying with ASTM C1029, Type II, and the following properties:

1. Properties:
  - a. Density (ASTM D1622): Nominal 2.0-lb/cu.ft. (32-kg/cu. m).
  - b. Closed-cell Content (ASTM D6226): 90 percent (minimum).
  - c. Design R-Values (ASTM C518): R-6.7 per inch (25 mm) thickness.  
R-28 at 4 inches (102 mm) thick.
  - d. Flame Spread (ASTM E84): 25 or less.
  - e. Smoke Developed (ASTM E84): 350 or less.
  - f. Compressive Strength (ASTM D1621): 26 psi (0.18 MPa) minimum.
  - g. Tensile Strength (ASTM D1623, Type C): 62.4 psi (0.43 MPa) minimum.
  - h. Water Vapor Transmission (ASTM E96): 1.39 perm-inch (79.6 ng/Pa•s•m<sup>2</sup> at 25 mm) thick.
  - i. Blowing Agent: EPA-approved, zero ozone-depleting blowing agent.
- C. Fungi Resistance: "Pass" rating when tested in accordance to ASTM C 1338.

2.04 AUXILIARY MATERIALS

- A. Sealant at Transitions in Substrate and Connections to Adjacent Elements: One-component, high-performance, very low-modulus, high-movement, non-sag, fast-curing, hybrid sealant, "MasterSeal ® NP 150™" (BASF Construction Systems); or approved substitution.
- B. Transition Membrane: For use between spray polyurethane foam air barrier and roofing and other adjacent materials, and for use to flash around building fenestration, wall penetrations, and similar conditions, in accordance with local building codes.
  1. General: Comply with both general recommendations for air barriers and with air barrier material manufacturer's recommendations.
  2. "MasterSeal AWB®660-I" fluid-applied air/water-resistive barrier membrane including:
    - a. Sheathing Joint Fabric: Air barrier manufacturer's reinforced, nonwoven, polyester fabric and preformed corners.
      - 1) Provide "Quick Corner™ 6", pre manufactured corner reinforcement for use with sheathing joint fabric specified.
    - b. Transition Membrane: "TF MEMBRANE" polyester-faced, 30-mil (0.76-mm) thick, self-sealing, rubberized asphalt membrane.
    - c. Flashing Primer: "WS FLASHING PRIMER" water-based primer.
- C. Counter flashing for Masonry Through-Wall Flashing: "MasterSeal®-TWF"; or approved substitution.
- D. Foam Stop Angle: Metal or plastic angle used for foam stop.
  1. Plastic: Extruded thermoplastic angle, 60 mils (1.52 mm) thick, "Jam-Ex" (EXO-TEC Manufacturing, Inc.); or approved substitution.
- E. Primers: Air barrier manufacturer's recommended primers to enhance foam adhesion to certain substrates, including penetrating water-based epoxy primer/sealer, "FE Coat 1601", or elastomeric acrylic primer, "Spraycoat 1800".
- F. Portable SPF Application Units: "Kit" foam containers with closed cell SPF, Class 1, nominal 2 lb per cubic foot (907 grams per 0.028 cubic meter) density, for incidental use; one of the following:
  1. "Touch n' Seal" (Convenience Products).
  2. "Versi-Foam" (RHH Foam Systems, Inc.).
- G. One-Component Foams (OCF): Air barrier manufacturer's suggested open cell, one component product for use around windows and doors; one of the following:
  1. "Touch n' Seal" (Convenience Products).

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

2. "Versi-Tite Window & Door Foam Sealant" (RHH Foam Systems, Inc.).
- H. Brick Ties: Ties should be compatible for use with Spray Polyurethane Foam applications. The following are examples of approved brick ties to be used with continuous SPF insulation:
  1. "CTP-16" (Construction Tie Products).
- I. Block Filler: Heavy-bodied, copolymer-based block filler, "MasterSeal AWB®-600 FL" (BASF Building Systems).
- J. Intumescent Coating for NFPA 285 compliance per requirements when using behind metal panels.
  1. Walltite coated with TPR2 F10E Intumescent @ 18 wet mils and a topcoat TPR2 F1 @ 6.6 wet mils

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions under which the air barrier system will be installed, with installer present, for compliance with requirements.
  1. General: Verify that surfaces and conditions are suitable prior to commencing work of this Section. Notify Architect or designated representative in writing of anticipated problems using air barrier over substrate prior to proceeding. Do not proceed with installation until unsatisfactory conditions have been corrected.
  2. Verify that concrete is visibly dry and has cured and aged for minimum time period recommended in writing by concrete design engineer and producer.
    - a. General contractor is responsible for ensuring that the surface to receive spray foam is dry enough for proper foam adhesion.
  3. Ensure that the following conditions are met:
    - a. Surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants;
    - b. Concrete surfaces are cured and dry, smooth without large voids, spalled areas and sharp protrusions;
    - c. Masonry surfaces are smooth or have been suitably prepared by others, unless preparation is performed under this Section of the Work;
    - d. Masonry joints are flush and completely filled with mortar, and all excess mortar on masonry ties has been removed;
    - e. Substrate areas meet the requirements of the transition membrane manufacturer.

3.02 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate in accordance with manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
  1. Ensure that penetrating work is in place and clean-up by other trades is complete.
  2. Prepare surfaces by air blast, vacuum, brushing, scrubbing, scraping, or grinding to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion and integrity of the spray polyurethane foam.
  3. Metal: Wipe down metal surfaces to remove release agents and other non-compatible coatings, using clean sponges or rags soaked in a cleaning material compatible with the spray polyurethane foam. If necessary, prime metal to receive spray polyurethane foam to ensure adhesion.
  4. Ensure masonry veneer anchors are in place and compatible with the spray foam.
- B. Prime substrate for application of TF MEMBRANE strips as recommended by manufacturer

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

and as follows:

1. Prime masonry and concrete substrates with appropriate conditioning primers;
  2. Prime glass-mat-faced gypsum sheathing with an adequate number of coats to achieve required bond, and adequate drying time between coats
  3. Prime wood, metal, and painted substrates
  4. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air barrier and at protrusions. Provide termination bar and sealant if necessary
  5. Read all material safety data sheets (if applicable) for materials being installed and coordinate requirements with other trades
  6. Discuss the spray areas and plans for safely protecting workers performing the application and keeping others out of that area during the application (spraying)
- C. Protect adjacent construction and materials from spray-applied materials as follows:
1. Mask and cover adjacent areas to protect from over spray
  2. Ensure that required foam stop or back-up material are in place to prevent over spray and achieve complete seal;
  3. Shut down and seal off existing ventilation equipment. Install temporary ducting and fans to ensure adequate ventilation of work area. Consult EPA's "Ventilation Guidance for Spray Polyurethane Foam Application" document available at the following link:  
<http://www.epa.gov/dfe/pubs/projects/spf/ventilation-guidance.html>  
Additional guidance on ventilation can be found in the Spray Foam Coalition, of the Center for the Polyurethanes Industry, "Ventilation Considerations for Spray Polyurethane Foam" document available at the following link:  
<http://polyurethane.americanchemistry.com/Spray-Foam-Coalition/Guidance-on-Ventilation-During-Installation-of-Interior-Applications-of-High-Pressure-SPF.pdf>
  4. Erect barriers, isolate and restrict access to work area and post warning signs to advise non protected personnel to avoid the spray area.

3.03 TRANSITION MEMBRANE INSTALLATION

- A. Transition Detail Strip Installation (MasterSeal® 660-I, SHEATHING FABRIC, and TF MEMBRANE): Install transition strip materials including, but not limited to the air/water-resistive barrier, transition membrane material, and through-wall flashing material, to provide continuity throughout the building envelope. Apply products in accordance with manufacturer's current application procedures and Project requirements.
- B. Transition Membrane:
1. Install MasterSeal® 660-I / SHEATHING FABRIC and/or TF MEMBRANE and sealant in accordance with the Drawings and Specifications to form a seal with adjacent construction and maintain a continuous air/water-resistive barrier.
    - a. General Contractor:
      - 1) Make provisions to coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane, and;
      - 2) to install strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over both substrates.
  2. Primer and Self-Adhering Membrane Flashing:
    - a. Primer: Apply WS FLASHING PRIMER to substrates scheduled to receive TF MEMBRANE and at required amount. Limit priming to areas that will be covered with TF MEMBRANE on the same day. Re prime areas exposed for more than 24 hours.
    - b. Membrane: Apply TF MEMBRANE as soon as possible after WS FLASHING

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

PRIMER is dry and tacky. Using a wallpaper roller, extension-handled counter top roller, or weighted hand roller, firmly roll the TF MEMBRANE to the area being sealed. As the TF MEMBRANE is applied, pull more of the release film from the TF MEMBRANE, exposing the adhesive surface, pressing down on the TF MEMBRANE with a roller and keeping the TF MEMBRANE smooth.

- c. Spray Foam Over Membrane: The polyester face of the TF Membrane is not required to be coated with the MasterSeal® 660-I liquid applied material if the Walltite product will be directly applied over it. If the TF membrane will be exposed such as at a window opening, coat the polyester face of the TF Membrane with the MasterSeal® 660-I liquid applied material to provide a surface suitable to receive sealants, etc.
3. General Contractor:
  - a. Make provisions to connect and seal exterior wall air/water-resistive barrier membrane continuously to roofing membrane, concrete below-grade structures, floor-to-floor construction, exterior door framing, storefront systems, glazed curtain wall systems, window systems, louvers, and other construction interfaces used in exterior walls, using accessory materials;
  - b. Apply joint sealants forming part of air/water-resistive barrier assembly within sealant manufacturer's recommended application procedures, and;
  - c. Fill gaps in perimeter frame surfaces of exterior door framing, storefront systems, glazed curtain wall systems, window systems, louvers, and miscellaneous penetrations of air/water-resistive barrier membrane with foam sealant.
4. Flashing Membranes:
  - a. Primer: Apply WS FLASHING PRIMER to perimeter frame surfaces of exterior door framing, storefront systems, glazed curtain wall systems, window systems, louvers, and other construction interfaces used in exterior walls.
  - b. Apply WS FLASHING PRIMER and TF MEMBRANE transition strip so that a minimum of 3 inches (75 mm) of coverage is achieved over both.
5. Repair: Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fish mouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.
- C. Through-Wall Flashing Installation:
  1. Primer: Apply WS FLASHING primer to wall substrates that will receive MasterSeal® 660-I membrane. Limit priming to areas that will be covered with MasterSeal®-TWF on the same day. Re-prime areas exposed for more than 24 hours.
  2. Preformed Corners at Building Corners when Applicable: Install appropriate preformed inside and outside corners, and end dams; embedded in MasterSeal NP 150 sealant.
  3. Ensure that wall substrates that will receive MasterSeal®-TWF membrane have been primed, and that the primer is tacky. If time and other factors have caused the primer to lose tackiness, apply a second coat.
  4. Membrane: Cut MasterSeal®-TWF membrane into workable lengths.
    - a. Remove half of the release paper lengthwise and fold it along the membrane.
    - b. Install the membrane onto the primed substrate, smoothing it to avoid formation of fish mouths.
    - c. Remove the second half of the release paper and complete the installation in the same manner, ensuring fish mouth-free application. Repair fish mouths that may form by slitting them and applying MasterSeal NP 150 sealant to seal the repair.
    - d. Provide a minimum 2-inch (51-mm) lap onto preformed corners.
    - e. Firmly post-roll the adhered membrane with a hard roller. Apply MasterSeal NP

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

- 150 sealant to terminating edges and laps.
5. Drip Edge:
    - a. Membrane Drip Edge:
      - 1) In order to use the intrinsic drip edge feature, position the membrane so the adhesive-free side extends a minimum 1/4 inch (7mm) through the outer wall to form a drip.
      - 2) Apply a bead of MasterSeal NP 150 sealant under the drip edge to seal the bottom.
    - b. Metal Drip Edge: If using a metal drip edge, position the membrane so the adhesive-treated side laps onto the metal drip edge.
  6. Membrane Securement Methods:
    - a. TF MEMBRANE:
      - 1) Apply WS FLASHING PRIMER to the backup wall above MasterSeal®-TWF membrane. Once tacky, apply a strip of TF MEMBRANE 4 inches (102 mm) wide across the top of the MasterSeal®-TWF membrane, centering the TF MEMBRANE so that half the TF MEMBRANE extends onto the primed backup wall.
      - 2) Post roll TF MEMBRANE and saturate with MasterSeal® to create a seamless transition.
    - b. Termination Bar:
      - 1) Adhere MasterSeal®-TWF membrane to the backup wall.
      - 2) Attach the termination bar to the top horizontal edge of the MasterSeal®-TWF membrane and to the backup wall.
      - 3) Apply MasterSeal NP 150 to the top edge of ENERSHIELD®-TWF membrane to create a uniform seal.
    - c. Masonry Joint: Build MasterSeal®-TWF membrane directly into a course of block to secure flashing between CMU courses.
- D. Install materials in accordance with BASF recommendations, and the following:
1. Seal around penetrations with termination mastic, MasterSeal NP 150 sealant, membrane counter flashing or other procedure in accordance with manufacturer's recommendations.
  2. Connect air barrier in exterior wall assembly continuously to the air barrier of the roof, to concrete below-grade structures, to exterior doors, storefront, curtain wall, windows, louvers, and other intersection conditions, and perform sealing of penetrations, using accessory materials and in accordance with the manufacturer's recommendations.
  3. At changes in substrate plane, provide transition material (bead of polyurethane sealant, mastic, MasterSeal NP 150 sealant, membrane counter flashing or other material recommended by manufacturer) under membrane to eliminate sharp 90-degree inside corners and to make a smooth transition from one plane to another.
  4. Provide mechanically fastened noncorrosive metal sheet to span gaps in substrate plane and to make a smooth transition from one plane to the other. Ensure substrate continuously supports membrane.
  5. At through-wall flashings, seal exposed top edge of strip with bead of mastic or MasterSeal NP 150 sealant as recommended by manufacturer.
  6. At deflection and control joints, provide backup for the membrane to accommodate anticipated movement.
  7. At expansion and seismic joints provide transition to the joint assemblies.
  8. Apply a bead of MasterSeal NP 150 sealant or trowel coat of mastic along membrane seams at reverse-lapped seams, rough cuts, and as recommended by the manufacturer.
  9. At end of each working day, seal top edge of membrane to substrate with termination

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

mastic or MasterSeal NP 150 sealant.

10. Do not allow materials to come in contact with chemically incompatible materials.
11. Do not expose membrane to sunlight longer than 180 days.

3.04 SPRAYED FOAM AIR BARRIER SYSTEM APPLICATION

A. General: Spray-apply polyurethane foam materials in accordance with manufacturer's recommendations.

1. Health and Safety: Follow industry health and safety practices as outlined on [www.spraypolyurethane.org](http://www.spraypolyurethane.org)
2. Equipment: Use equipment to spray polyurethane foam complying with the manufacturer's recommendations for the specific type of application.
  - a. Record equipment settings on the Daily Work Record in accordance with the ABAA Quality Assurance Program.
  - b. Each proportioner unit shall supply only one spray gun.
3. Ambient Conditions: Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer.
4. Install the spray foam using a "picture frame technique" against studs or brackets. Use a "flash coat" of WALLTITE installed over low melting asphalt or plastic based materials to avoid high exotherm temperatures. Allow the foam to cool down to the recommended temperature before adding successive lifts per design requirements.
5. Apply in consecutive passes as recommended by manufacturer to thickness as indicated on Drawings, but not less than 1/2 inch (12.70 mm) unless feathering for tying in to existing installed SPF, and not greater than 2 inches (50.80 mm). Detail work/thickness, shall be performed in accordance with manufacturer's recommendations.
6. When applying to flexible plastic flashings and self-adhering flashings and membranes, the first application of SPF should be a flash coat of material.
7. Install to specified thickness tolerances, but not less than minus ¼ inch and not more than plus 1/2 inch (12.70 mm) as long as it does not occlude the air cavity. Consideration must be given to designed air space; verify tolerances with design professional.
8. Do not install spray polyurethane foam within 3 inches (76.20 mm) of heat-emitting devices such as light fixtures and chimneys.
9. Finished surface of foam insulation shall be free of voids.
10. Remove masking materials and overspray from adjacent areas as soon as reasonable. Ensure cleaning methods do not damage work performed by others.
11. Trim excess thicknesses that would interfere with the application of cladding/covering system by other trades.
12. Clean and restore surfaces soiled by work of this Section. Consult with manufacturers of the work soiled before cleaning to ensure methods used will not damage the work.
13. Complete connections to other components and repair gaps, holes and other damage using material as recommended by the manufacturer.
14. Use care to avoid installations that result in non-restrained edges of the SPF when applied over other construction materials that are not permanently and firmly bonded to the substrate, especially at openings.

3.05 FIELD QUALITY CONTROL

- A. Field Quality Assurance: Implement the ABAA Quality Assurance Program requirements. Cooperate with ABAA auditors and independent testing and inspection agencies engaged by the Owner. Do not cover air barrier until it has been inspected, tested and accepted.
- B. Installer Self-Inspection: Conduct daily inspections and record the results of these inspections

SECTION 07 27 36 – SPRAYED FOAM INSULATING AIR BARRIER SYSTEM: continued

on a Daily Work Record in accordance with the ABAA Quality Assurance Program. Make Daily Work Records available for review upon request.

- C. Owner's Inspection and Testing: Cooperate with Owner's testing agency, if utilized. Allow access to work areas and staging. Notify Owner's testing agency in writing, of schedule for Work of this Section to allow sufficient time for testing and inspection. Daily inspection and testing may be required. Do not cover Work of this Section until testing and inspection is accepted.
- D. ABAA Site Inspections: Arrange and pay for site audits by ABAA to verify conformance with the manufacturer's instructions, the ABAA Quality Assurance Program, and this Section of the Project Specifications.
  - 1. Perform audits in accordance with ABAA protocol. Forward written inspection reports to the Architect within 3 working days of the receipt of the audit report.
  - 2. If the inspections reveal defects, promptly remove and replace defective work at no additional expense to the Owner.

3.06 PROTECTING AND CLEANING

- A. Protect air barrier assemblies from damage during application and remainder of construction period, in accordance with manufacturer's written instructions.
  - 1. Coordinate with installers and installation of materials which cover the SPF air barrier system, to ensure exposure period does not exceed that recommended by the air barrier manufacturer.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction and acceptable to the primary material manufacturer of the affected material.

END OF SECTION 07 27 36

## SECTION 07 92 00 - JOINT SEALANTS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

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

#### 1.02 SUMMARY:

- A. This Section includes sealants and related materials for application in the joint locations specified in PART 2, this Section.

#### 1.03 REFERENCES:

- A. Applicable Standards:
  - 1. American Society for Testing and Materials (ASTM):
    - a. C920 - Elastomeric Joint Sealants.
    - b. C1193 - Guide for Use of Joint Sealants.

#### 1.04 SUBMITTALS:

- A. Submit as specified in DIVISION 1.
- B. Includes, but not limited to, the following for each type of sealant or associated material required:
  - 1. Product data and Specifications, including instructions for joint preparation and sealer application.
  - 2. Color charts.

#### 1.05 QUALITY ASSURANCE:

- A. Manufacturer of sealants shall have a minimum of five years of successful experience in the production of types of sealants required.
- B. Sealant installer shall be certified by the sealant manufacturer as having the necessary experience and equipment to install the materials properly.
- C. Obtain joint sealant materials from a single manufacturer for each different product required.

#### 1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver all materials in original sealed containers or bundles with labels and inscriptions legible and intact, and informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store all materials in areas suitable to prevent deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

#### 1.07 PROJECT CONDITIONS:

- A. Environmental Conditions:
  - 1. Do not proceed with installation of joint sealers under the following conditions:
    - a. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40°F (4.4°C).
    - b. When joint substrates are wet due to rain, frost, condensation, or other causes.
- B. Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are more or less than allowed by joint sealer manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

SECTION 07 92 00 - JOINT SEALANTS: continued

- D. Proceed with application only when forecasted weather conditions are favorable for proper cure and development of bond strength.

1.08 WARRANTY

- A. The Manufacturer shall warrant that all material shall be free from defects caused by faulty material or workmanship for a minimum period of two (2) years from the date of Substantial Completion, unless otherwise specified.
- B. Warranties shall comply with the requirements of Section 01785.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Manufacturer listed under each type of material is to establish minimum quality and specific type. Equivalent products of manufacturers listed below will be acceptable subject to suitability for intended condition.
- B. Sealants and Caulking:
  - 1. BASF Corporation.
  - 2. Dow Corning Corp.
  - 3. General Electric.
  - 4. Pecora Corporation.
  - 5. Sika Chemical Corp.
  - 6. Sonneborn Building Products.
  - 7. Tremco Manufacturing Company.
  - 8. W. R. Meadows, Inc.
- C. Sealant Backer Rod (Closed-Cell):
  - 1. Bostik Construction Products Div.
  - 2. Sonneborn Building Products - Sonofoam.
  - 3. W. R. Meadows - Sealtight Backer Rod or Cera-Rod.

2.02 GENERAL:

- A. Before purchase of each specified sealant, investigate its compatibility with the joint surfaces, joint fillers, and other materials in the joint system. Select materials for compatibility with joint surfaces and other indicated exposures, and, except as otherwise indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.
- B. Provide colors as selected by Engineer's Consultant from manufacturer's standard colors.

2.03 ELASTOMERIC SEALANTS:

- A. Sealants conforming to equivalent Federal Specifications will be acceptable.
- B. One-Component Urethane Sealant - Use NT:
  - 1. Conform to ASTM C920, Type S, Grade NS, Class 35. Use classification as required by locations stated below.
  - 2. Manufacturers:
    - a. Pecora Corp. - Dynatrol I.
    - b. Tremco - Dymonic.
    - c. Basf – Masterseal MP1
  - 3. Use in the following locations:
    - a. Exterior and interior joints around perimeter door, louvers and frames.

SECTION 07 92 00 - JOINT SEALANTS: continued

- b. Exterior and interior joints at penetration of walls, decks, and floors by piping, conduit, and other services or equipment except fire-rated penetrations.
- c. Veneer Joints (VJ).
- d. Roof flashing materials as indicated.
- e. Roof flashing reglets and retainers.
- f. Miscellaneous locations as indicated.
- g. Miscellaneous locations as required (but not indicated).

2.04 MISCELLANEOUS MATERIALS:

- A. Joint Cleaner: Type as recommended by the sealant manufacturer for the joint surfaces to be cleaned, which is not harmful to substrates and adjacent surfaces and which does not leave oily residues or have detrimental effect on sealant adhesion or in-service performance.
- B. Joint Primer/Sealer: Type as recommended by the sealant manufacturer for the joint surfaces to be primed or sealed.
- C. Bond-Breaker Tape:
  - 1. Polyethylene tape or other plastic tape as recommended by the sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint, where such adhesion would result in sealant failure.
  - 2. Provide self-adhesive tape where applicable.
- D. Sealant Backer Rod:
  - 1. Compressible rod stock, preformed, resilient, nonwaxing, nonextruding strips of flexible, nongassing plastic foam, nonabsorbent to water and gas, and of size, shape and density, sealant depth, and that otherwise contributes to optimum sealant performance.
  - 2. Rod shall be of size that will compress 25% in joint width and shape to control joint depth, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side and provide a highly compressible backer to minimize the possibility of sealant extrusion when joint is compressed.

PART 3 - EXECUTION

3.01 JOINT SURFACE PREPARATION:

- A. Joint Cleaning:
  - 1. Clean joint surfaces immediately before application of sealant.
  - 2. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust, paints (except for permanent protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealers, oil, grease, waterproofing water repellents, water, surface dirt, and frost.
  - 3. Clean concrete, masonry, and similar porous joint surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above operations by vacuuming or blowing out joints with oil-free compressed air.
  - 4. Clean metal and other nonporous surfaces with chemical cleaners or other means which are not harmful to substrates and do not leave residues capable of interfering with adhesion of joint sealers.
  - 5. Remove laitance and form-release agents from concrete.
- B. Joint Priming: Prime joint substrates as required by joint sealant manufacturer. Confine primers to areas of joint sealer bond; do not allow spillage or migration onto adjoining surfaces.

SECTION 07 92 00 - JOINT SEALANTS: continued

- C. Surface Protection: Use where required to prevent contact of sealant with adjoining surfaces which would otherwise be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.02 APPLICATION:

- A. Conform to sealant manufacturer's printed instructions except where more stringent requirements apply.
  - 1. For sealant installation, comply with ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install joint-filler units at depth or position in joint to coordinate with other Work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between ends of joint fillers. Do not stretch, twist, puncture, or tear joint fillers. Remove absorbent joint fillers which have become wet prior to sealant installation and replace with dry materials.
- C. Install sealant backer rod for sealants except where indicated to be omitted.
- D. Install bond-breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to back of joints would result in sealant failure.
- E. Install sealants by proven installation techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths, which allow optimum sealant-movement capability.
- F. Install sealants to depths as indicated or, if not indicated as recommended by sealant manufacturer within the following limitations:
  - 1. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2 inch deep nor less than 1/4 inch deep.
- G. Unless indicated otherwise, provide a slightly concave surface conforming to ASTM C1193. (Provide recessed or flush configuration where indicated.)
- H. Do not allow sealants or compounds to overflow from confines of joint or spill onto adjoining surfaces. Clean the adjoining surfaces to eliminate evidence of spillage without damage to adjoining surfaces or finishes.
- I. Immediately after sealant installation and prior to time skimming or curing begins, tool nonsag sealants to form smooth uniform beads of configuration indicated to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Do not use tooling agent which would discolor sealants or adjacent surfaces or are not approved by sealant manufacturer. Remove excess sealant from surfaces adjacent to joint.

3.03 CURE AND PROTECTION:

- A. Cure sealants in compliance with manufacturer's printed instructions and recommendations to obtain high early bond strength, internal cohesive strength, and surface durability. Cure and protect sealants in a manner which will minimize increases in modulus of elasticity and other accelerated aging effects. Replace or restore sealants which are damaged or deteriorated during construction period. Repaired areas shall be indistinguishable from original Work.

3.04 FIELD QUALITY CONTROL:

- A. After nominal cure of exterior joint sealants which are exposed to weather, test for water leaks as follows:
  - 1. Flood joint exposure with water directed from a 3/4-inch garden hose and connected to water system with 25-psi minimum static water pressure.

SECTION 07 92 00 - JOINT SEALANTS: continued

2. Hold hose perpendicular to wall face, 2'-0" from joint, and move stream of water along joint at approximate rate of 20 feet per minute.
  3. Test approximately 5% of total joint system in locations which are typical of every joint condition and which can be inspected easily for leakage on opposite face.
  4. Perform tests in presence of Engineer's Consultant.
- B. Repair sealant installation at leaks or, if leakage is excessive, replace sealant installation as required. Do not perform repair or replacement work until joints are dry.

END OF SECTION 07 92 00

DIVISION 08 - DOORS AND WINDOWS

SECTION 08 16 13 - FIBERGLASS DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes heavy-duty, corrosion-resistant, fiberglass-reinforced plastic (FRP) doors and frames.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 08 70 00 - FINISH HARDWARE.

1.02 REFERENCES:

- A. Applicable Standards:
  - 1. American Standards for Testing and Materials (ASTM):
    - a. E84 - Surface Burning Characteristics of Building Materials.
  - 2. American National Standards Institute (ANSI):
    - a. A117.1 - Specifications for ADA requirements and handicap accessibility.
    - b. A250.4-2001 - Swinging doors and frames.

1.03 SUBMITTALS:

- A. Submit as specified in DIVISION 1.
- B. Includes, but not limited to, the following:
  - 1. Product Data: Include product literature, elevations, profiles, construction details, and specifications. Include instructions pertaining to product storage and handling.
  - 2. Shop Drawings: Include elevations of each door and frame type, details, and door schedule using Engineer's door numbers.
  - 3. Samples: Include small Sample (approximately 8" x 10") to show door and frame construction. Also provide color chips for selection of color(s) by Engineer/Architect from manufacturer's standards.
  - 4. Warranty.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. Ship all doors and frames as complete units, with trim and all necessary items which may be required for final installation.
- B. Deliver all materials to the site in sealed, undamaged containers, fully identified.
- C. Store materials in original containers, on end, and in a manner to prevent falling or damage to face, corners, or edges.

1.05 QUALITY ASSURANCE:

- A. Doors and frames shall be by the same manufacturer.
- B. Hardware, glass, glazing, and louvers shall be coordinated with door system manufacturer to assure proper reinforcement and fit.
- C. Manufacturer shall be capable of manufacturing door system suitable for intended purpose and of quality as specified herein.

1.06 WARRANTY:

- A. Fiberglass-reinforced plastic doors and frames warrants for 10 years for material and workmanship and shall be lifetime guaranteed not to fail due to corrosion.

SECTION 08 16 13 - FIBERGLASS DOORS AND FRAMES: continued

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Advance Fiberglass Inc. - Fib-R-Dor, by Chase Industries. [bobhook79@gmail.com](mailto:bobhook79@gmail.com)
- B. Chem-Pruf Door Co. [bobhook79@gmail.com](mailto:bobhook79@gmail.com)
- C. Special Lite Inc. - Sal Donze, [sal@kinassoc.com](mailto:sal@kinassoc.com)
- D. Simon Door - Esmi, [esmi@simondoor.com](mailto:esmi@simondoor.com)

2.02 CONSTRUCTION:

- A. Door Construction:
  - 1. Doors shall be of fiberglass-reinforced plastic (FRP) using polymers tailored to the specific corrosive environment. Glass content shall be a minimum of 35% by weight. Doors shall be flush construction with no seams or cracks, 1-3/4-inch thickness. Voids between door plates shall be filled with Polypropylene Honeycomb (PPC) core material or non-wood material to achieve minimum R-value of 3.0. Doors shall have a flame spread of 25 or less per ASTM E84.
  - 2. Plates, styles, and rails shall be constructed of layered FRP and molded in one continuous piece to door dimensions.
    - a. Use vinyl ester resin for plate construction.
  - 3. Doors shall have adequate reinforcing and compression members to accommodate hinges and all other required hardware.
  - 4. Window and louver opening moldings shall be molded integrally with or molded separately and securely fastened to door plates so moisture will not penetrate the door cavity. Provide windows with glazing pins sealed to maintain integrity of system.
  - 5. Color shall be a color as selected by Engineer from manufacturer's full range of colors and glosses.
    - a. Finish shall be smooth/gloss free of cavities and crevices.
    - b. Manufacturer's standard high performance molded in finish or two-part aliphatic polyurethane coating.
- B. Frame Construction:
  - 1. Frame construction shall be similar to door construction and materials, of stick and header type, mortised and tenoned for the header joint, 2" depth x 5-3/4" width.
  - 2. Frames shall have adequate reinforcing for hinges and other hardware. Mortises for hinges shall be molded into frame.
  - 3. Provide fiberglass frames for doors, transoms and fixed interior windows.
- C. Doors and frames shall be prefitted and assembled so that no cutting or other modifications shall be required in the field.
- D. Door Louvers: Provide louvers with blades or baffles formed of 1/8"-inch solid fiberglass set into a solid four piece frame with corner reinforcement.
- E. Provide doors with all necessary screws, anchors, fasteners, and expansion bolts as required for installation. Metal shall be of corrosion-resistant material. Maintain warranty same as for doors.
- F. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.
  - 1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
  - 2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.
- G. Transom Panels: Construct same as adjacent doors and frames.

SECTION 08 16 13 - FIBERGLASS DOORS AND FRAMES: continued

- H. Removable Mullion: Construct same as adjacent frames.
- I. Hardware: Specified in SECTION 08 70 00.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Frames:
  - 1. Erect frames as walls progress.
  - 2. Erect doors after completion of adjacent walls. Erect door frames plumb, square, true, securely braced, and in accordance with the manufacturer's recommendations.
  - 3. Anchor framing members to jambs. Space anchors not more than 24 inches apart.
  - 4. Make member-to-member connections with appropriate clips and stainless-steel screws.
  - 5. After installation of frames, remove temporary braces and spreader bars if used.
- B. Doors and Hardware:
  - 1. Carefully and properly hang doors, install hardware, lubricate, and adjust each item of hardware for proper operation.
  - 2. For installation of hardware other than specified this Section, refer to SECTION 08 70 00. Exposed fasteners shall be stainless steel.
  - 3. To the extent possible, all door hardware to be factory installed.

3.02 ADJUSTMENTS AND CLEANING:

- A. Remove dirt and excess sealants, lubricants, and glazing compounds from exposed surfaces.
- B. Repair minor surface abrasions and scratches to original new finish. If dents or other damage are unrepairable, replace entire door or frame.
- C. Protect completed installation.

END OF SECTION 08 16 13

## SECTION 08 33 23 - OVERHEAD COILING DOORS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

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

#### 1.02 SUMMARY:

- A. Section Includes:
  - 1. Overhead coiling (exterior) doors.

#### 1.03 REFERENCES:

- A. American Architectural Manufacturers Association:
  - 1. AAMA 611-1998 - Voluntary Specification for Anodized Architectural Aluminum.
  - 2. AAMA 2603-2002 - Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International:
  - 1. ASTM A653/A653M-05a - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A666-03 - Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
  - 3. ASTM B209-04 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - 4. ASTM B209M-04 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.
  - 5. ASTM B221-05 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 6. ASTM B221M-05 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes Metric.
  - 7. ASTM E84-05e1 - Test Method for Surface Burning Characteristics of Building Materials.
  - 8. ASTM E413-04 - Classification for Rating Sound Insulation.
  - 9. ASTM E1886-05 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
  - 10. ASTM E1996-05 - Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
- C. International Code Council:
  - 1. IBC Section 715 - Fire Test of Door Assemblies.
- D. International Code Council/American National Standards Institute:
  - 1. ICC/ANSI A117.1-2003 - Accessible and Usable Buildings and Facilities (CABO).
- E. National Association of Architectural Metal Manufacturers:
  - 1. Metal Finishes Manual for Architectural and Metal Products. 1988 (ANSI).
- F. NFPA:
  - 1. NFPA 70-2005 - National Electrical Code.
  - 2. NFPA 80-1999 - Fire Doors and Fire Windows.
  - 3. NFPA 105-2003 - Installation of Smoke Door Assemblies.
  - 4. NFPA 252-2003 - Fire Tests of Door Assemblies.
- G. Structural Engineering Institute/American Society of Civil Engineers:
  - 1. SEI/ASCE 7-2002 - Minimum Design Loads for Buildings and Other Structures.

SECTION 08 33 23 - OVERHEAD COILING DOORS: continued

- H. Underwriters Laboratories Inc.:
  - 1. UL 10B-1997 - Fire Tests of Door Assemblies.
  - 2. UL 1784-2004 - Air Leakage Tests of Door Assemblies.
- I. U.S. Architectural & Transportation Barriers Compliance Board:
  - 1. Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities. Adopted in 2010.

1.04 PERFORMANCE REQUIREMENTS:

- A. Delegated Design: Design overhead coiling doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Provide overhead coiling doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components:
  - 1. Wind Load: Uniform service level (ASD) pressure (velocity pressure) of 20 psf minimum
- C. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than 20,000 cycles. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.05 ACTION SUBMITTALS:

- A. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
  - 1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
  - 2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 2. Show locations of replaceable fusible links.
- C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
  - 1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
  - 1. Curtain Slats: 12 inches (305 mm) long.
- E. Delegated-Design Submittal: For overhead coiling doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- F. Iron and steel products must be produced in the United States and certifications of such production must be provided to the Owner prior to shipment.

1.06 INFORMATIONAL SUBMITTALS:

- A. Qualification Data: For qualified Installer.

SECTION 08 33 23 - OVERHEAD COILING DOORS: continued

1.07 CLOSEOUT SUBMITTALS:

- A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.08 QUALITY ASSURANCE:

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
  - 1. Obtain operators and controls from overhead coiling door manufacturer.
- C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.09 WARRANTY

- A. The equipment Manufacturer shall warrant that all equipment shall be free from defects caused by faulty material or workmanship for a minimum period of two (2) years from the date of Substantial Completion, unless otherwise specified.
- B. Warranties shall comply with the requirements of Section 01785.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cookson Company.
  - 2. Overhead Door Corporation.
  - 3. Raynor.
  - 4. Or engineer approved equal.

2.02 DOOR CURTAIN MATERIALS AND CONSTRUCTION:

- A. Exterior Door Curtain: Fabricate overhead coiling door curtain of interlocking slats, designed to withstand wind loading indicated on structural drawings (120 mph), in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of material thickness recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
  - 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A653/A653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch (0.71 mm) and as required to meet requirements.
    - a. Provide manufacturer's standard flat-profile slats.
  - 2. Insulation: Fill slat with (Min. R-7) rigid cellular polystyrene or polyurethane-foam-type thermal insulation complying with maximum flame-spread and smoke-developed indices of 75 and 450, respectively, according to ASTM E84. Enclose insulation completely within metal slat face.
  - 3. Inside Curtain Slat Face: To match material of outside metal curtain slat and as follows:
    - a. Steel Sheet Thickness: Same thickness as outside steel curtain face slat.
- B. Endlocks for Service Doors: Malleable-iron casings galvanized after fabrication, secured to curtain slats with galvanized rivets or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.

SECTION 08 33 23 - OVERHEAD COILING DOORS: continued

- C. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick; fabricated from manufacturer's standard hot-dip galvanized steel, stainless steel, or aluminum extrusions to match curtain slats and finish.
- D. Door Bottom: Equip bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- E. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.
  - 1. Fabricate curtain jamb guides of steel angles, or channels and angles, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Build up units with not less than 3/16-inch (5-mm) thick, galvanized steel sections complying with ASTM A36 (ASTM A36M), and ASTM A123. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain and a continuous bar for holding wind locks. Provide continuous integral wear strips to prevent metal-to-metal contact and minimize noise of travel and removable stops on guides to prevent overtravel of curtain.

2.03 HOOD:

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
  - 1. Galvanized Steel: Nominal 0.028-inch (0.71-mm) thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A653/A653M.
  - 2. Shape:
    - a. Round.
  - 3. Exterior Doors Weatherseals: Provide replaceable, adjustable, continuous, compressible weather-stripping gaskets fitted to bottom and at top of exterior doors, unless otherwise indicated. At door head, use 1/8-inch (3-mm) thick, replaceable, continuous sheet secured to inside of curtain coil hood.
    - a. Provide with combination bottom weatherseal.
    - b. In addition, provide replaceable, adjustable, continuous, flexible, 1/8-inch (3-mm) thick seals of flexible vinyl, rubber, or neoprene at door jambs for a weathertight installation.
  - 4. Exterior Door Windows: Provide windows of 1/4-inch (6-mm) clear, transparent acrylic sheet, of size and in arrangement shown. Set glazing in vinyl, rubber or neoprene glazing channel secured to curtain slats. Windows to be equal size and spacing. Windows to be sized per manufacturer's standard to fit in one curtain slat.
  - 5. Exterior Door Slide Bolts: Fabricate with side locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

2.04 CURTAIN ACCESSORIES:

- A. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
- B. Testing for manually operated doors shall allow resetting by opening the door without retensioning the counterbalancing mechanism.

SECTION 08 33 23 - OVERHEAD COILING DOORS: continued

2.05 COUNTERBALANCING MECHANISM:

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.
- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.06 EXTERIOR DOOR MANUAL DOOR OPERATORS:

- A. Provide manual operators unless electric door operators are indicated. When not shown, provide chain-hoist operator units for doors.
- B. Chain-Hoist Operator: Provide manual chain-hoist operator consisting of endless steel hand chain, chain pocket wheel and guard, and gear-reduction unit with a maximum 35-lbf (155-N) effort for door operation. Provide alloy steel hand chain with chain holder secured to operator guide.

2.07 GENERAL FINISH REQUIREMENTS:

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.08 EXTERIOR DOOR FINISHES:

- A. Powder-Coat-Applied Finish: Apply powder-coat-applied finish consisting of primer and topcoat(s) according to coating manufacturer's written instructions for cleaning, pretreatment, application, thermosetting, and minimum dry film thickness.
  - 1. Color and Gloss:
    - a. As indicated by manufacturer's color and gloss designations.
    - b. As selected by Engineer/Architect from manufacturer's full range of colors and glosses.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Verify door sizes, configuration, tolerances and conditions are acceptable.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

SECTION 08 33 23 - OVERHEAD COILING DOORS: continued

3.02 INSTALLATION:

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.
- D. Use anchorage devices to securely fasten assembly without distortion or stress.
- E. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

3.03 STARTUP SERVICE:

- A. Engage a factory-authorized service representative to perform startup service.
  - 1. Perform installation and startup checks according to manufacturer's written instructions.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.04 ADJUSTING:

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide weathertight fit around entire perimeter.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.06 CLEANING

- A. Clean components using non-abrasive materials and methods recommended by manufacturer.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.07 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 08 33 23

## SECTION 08 70 00 - FINISH HARDWARE

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes hardware for the proper installation, operation, and control of doors.

#### 1.02 REFERENCES:

- A. Applicable Standards:
  - 1. American National Standards Institute (ANSI):
    - a. A115 Series - Door and Frame Preparation.
    - b. A156 Series - Hardware.
  - 2. Builders Hardware Manufacturers Association (BHMA):
    - a. 1301 - Materials and Finishes.
  - 3. Door and Hardware Institute (DHI):
    - a. Keying - Procedures, Systems and Nomenclature.
    - b. Architectural Hardware Scheduling Sequence and Schedule Format.
    - c. Abbreviations and Symbols.
    - d. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames.
    - e. Recommended Procedure for Processing Hardware Schedules and Templates.
    - f. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames.
  - 4. UL, LLC (UL):
    - a. Building Materials Directory.
    - b. 305 - Panic Hardware.

#### 1.03 SUBMITTALS:

- A. Submit as specified in DIVISION 1.
- B. Includes, but not limited to, the following:
  - 1. Product data includes manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
  - 2. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
    - a. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
      - (1) Type, style, function, size, and finish of each hardware item.
      - (2) Name and manufacturer of each item.
      - (3) Fastenings and other pertinent information.
      - (4) Location of each hardware set cross referenced to indications on drawings both on floor plans and in door and frame schedule.
      - (5) Explanation of all abbreviations, symbols, and codes contained in schedule.
      - (6) Mounting locations for hardware.
      - (7) Door and frame sizes and materials.
      - (8) Keying information.
    - b. Keying Schedule: Submit separate detailed schedule indicating clearly how the Engineer's final instructions on keying of locks has been fulfilled.
    - c. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that

SECTION 08 70 00 - FINISH HARDWARE: continued

adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.04 QUALITY ASSURANCE:

- A. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Engineer and Contractor for consultation at reasonable times during the course of the Work.
  - 1. Require supplier to meet with Engineer to finalize keying requirements and to obtain final instructions in writing.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (Project Site).
- E. Provide secure lock-up for door hardware delivered to the project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the work will not be delayed by hardware losses both before and after installation.

1.06 COORDINATION:

- A. Coordinate hardware with other Work.
- B. Furnish templates and other detail matter as required to each fabricator of doors and frames, and to other Work to be prepared for the installation of hardware.
- C. Where Modifications to this Specification are required due to unanticipated conditions, make recommendations of alternative procedures to the Engineer for his consideration and approval.

1.07 MAINTENANCE:

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Engineer's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.01 ACCEPTABLE PRODUCTS: Items of hardware are specified in Door Schedule, with reference to the listing given in this Part - PRODUCT REQUIREMENTS.

2.02 PRODUCT REQUIREMENTS:

- A. Hardware shall meet the respective applicable standards specified in PART 1, this Section.
- B. Provide hardware complete with all fasteners, anchors, instructions, layout templates, and any specialized tools as required for satisfactory installation and adjustment.

SECTION 08 70 00 - FINISH HARDWARE: continued

- C. Provide manufacturer's standard products meeting the design intent of this Specification, free of imperfections affecting appearance or serviceability.
- D. Electronic locks and associated hardware shall be provided and installed in accordance with this Section. Coordinate configuration and initial setting of electronic locks with the Owner.
- E. Hardware is specified in PART 2 - HARDWARE SETS, this Section, by type and function category, each of which has been selected as that best meeting the application. Acceptable products are given for each category in the hardware sets below.

2.03 HARDWARE SCHEDULE: Refer to the Door Schedule on the Drawings to ascertain hands, and sizes.

<u>SET #1</u>				
<i>Doors 103, 104 (Exterior FRP single door with latch set)</i>				
Qty	Description	Catalog Number	Finish	Mfr.
3 EA	Hinge	5BB1HW 4.5 X 4.5 NRP	630	IVE
1 EA	Entrance Lock	ND53P6D SPA	626	SCH
1 EA	Lock Guard	LG12	630	IVE
1 EA	Surface Closer	4111 SCUSH	689	LCN
1 EA	Rain Drip	142A	AL	ZER
1 EA	Gasketing	429AA-S	AA	ZER
1 EA	Door Sweep	8197AA	AA	ZER
1 EA	Threshold	65A	A	ZER

Always free egress by inside lever

Mfr. = MANUFACTURER

SCH = Schlage

LCN = LCN

IVE = Ives

VON = Von Duprin

ZER = Zero

Or Engineer approved equal

2.04 KEYING:

- A. Keying requirements shall be determined by consultation with the Owner.
- B. Tag and identify keys.
- C. Provide three keys for each lock or cylinder.
- D. Key to existing master key system.
- E. Provide construction master keys for all exterior doors.

2.05 MATERIALS AND FABRICATION:

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location.
  - 1. Manufacturer's identification will be permitted on rim of lock cylinders only.

SECTION 08 70 00 - FINISH HARDWARE: continued

- B. Base Metals: Product hardware units of basic metal using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods except as otherwise specified.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated or specified.
- D. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed screws to match hardware finish.
- E. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use hex screw fasteners.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Check all frames and doors for proper hardware cutouts and reinforcements.
- B. Except as specified otherwise, install articles of hardware after finishes have been completed on the substrate. Note all requirements for coordination with protective coating applications.
- C. Install hardware at such a time in the Project schedule so as to minimize the possibility of damage from the activity of other trades prior to acceptance.
- D. Check the installation directions of PART 1, paragraph 1.01.B. - Related Work Specified Elsewhere, this Section, before proceeding.

3.02 INSTALLATION:

- A. Mount articles of hardware at locations and in the manner prescribed in the respective DHI standards specified in PART 1, this Section, unless otherwise specified.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the DIVISION 09 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. All field preparations, such as drilling, cutting, tapping, and countersinking shall be accurately executed to assure precise fitting and adjustment.
- E. Use fasteners of correct size and type with anchoring devices as required by construction conditions, suited to the nature of the attachment substrate, and the duty performance required.
- F. In the course of installation, avoid damage to hardware mechanisms, finishes, and surrounding surfaces; smearing of paints, sealants, and lubricants onto surfaces not intended to receive them; and the admission of foreign matter into chassis and cases of units and their associated preparations.
- G. Seal weather-protection components attached to the exterior sides of doors and frames in place with clear silicone caulk in such a manner as to ensure a continuously filled seam throughout the joinery.

SECTION 08 70 00 - FINISH HARDWARE: continued

- H. Cut and fit weather stripping accurately to affect the greatest possible continuity of the contact element. Where hardware-compatible extrusions are specified "do not cut," adjust templating of soffit-mounted hardware to suit the extrusion thickness, and mount all such items on the extrusions.
- I. Protection plates shall be installed on visual centers of closed doors. Bottom edges of all such plates shall be flush with bottoms of doors or shall meet top edges of surface-applied door sweeps where they are specified.
- J. At exterior doors, obtain satisfactory operation of the installation, then apply a thin layer of clear silicone caulk under hinge leaves, both door and frame. Remove excess caulk after torquing fasteners.
- K. Adjust door closers immediately upon installation. Adjust in exact conformance with manufacturer's printed instructions. Back-check shall be advanced to reduce shock at dead stop. Latching speed shall be set to assure unassisted positive latching. Readjustment of closers may be required prior to acceptance as directed by the Engineer. Adjust hold open device so door closes with normal use. Hold open device to be engaged only when extra push to the door is applied.
- L. Degrees of swing of doors are given for closers where exact dimensioning, of the installation to achieve the indicated angles, is required.

3.03 ADJUSTMENT AND CLEANING:

- A. Check and adjust each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
  - 1. Where door hardware is installed more than one month prior to acceptance or occupancy return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
  - 2. Checking and adjustment shall be performed by a certified Architectural Hardware Consultant to ensure proper operation and function of each unit.
- B. Lubricate units only as recommended by their manufacturers.
- C. Remove excess sealants, lubricants, and any other foreign substances, and protect all installations from subsequent damage.
- D. Clean units just prior to final acceptance, with only materials and procedures recommended by their manufacturers.
- E. Maintain the sheets of instruction, layout templates, and any supplementary literature regarding hardware in a readable condition. Transmit to the Engineer all such matter together with all spare parts, specialized tools, and other accessories supplied with the hardware. Also, transmit to the Engineer a copy of the approved hardware schedule. Notify the Engineer in writing that such transmittal has occurred.
- F. Instruct Owner's maintenance personnel in the proper adjustment and maintenance of door hardware and finishes. Instructions shall be performed by a certified Architectural Hardware Consultant or a qualified representative of the manufacturer.

END OF SECTION 08 70 00

## DIVISION 09 - FINISHES

### SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

#### PART 1 - GENERAL

##### 1.01 SUMMARY:

- A. This Section includes the following:
  - 1. Nonload-bearing steel framing members for gypsum board assemblies.
  - 2. Gypsum board assemblies attached to steel framing.

##### 1.02 REFERENCES:

- A. American National Standards Institute (ANSI):
  - 1. A108.11 - Interior Installation of Cementitious Backer Units.
  - 2. A118.9 - Cementitious Backer Units.
- B. American Society for Testing and Materials (ASTM):
  - 1. A568/A568MN - Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements.
  - 2. A641/A641M - Zinc-Coated (Galvanized) Carbon Steel Wire.
  - 3. A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 4. B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 5. B221M - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
  - 6. C11 - Terminology Relating to Gypsum and Related Building Materials and Systems.
  - 7. C36/C36M - Gypsum Wallboard.
  - 8. C423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
  - 9. C475 - Joint Compound and Joint Tape for Finishing Gypsum Board.
  - 10. C514 - Nails for the Application of Gypsum Wallboard.
  - 11. C557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
  - 12. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
  - 13. C630/C630M - Water-Resistant Gypsum Backing Board.
  - 14. C645 - Nonload (Axial) Bearing Steel Studs, Runners (Track) and Rigid Furring Channels for Screw Application of Gypsum Board.
  - 15. C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - 16. C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Board.
  - 17. C834 - Latex Sealants.
  - 18. C840 - Application and Finishing of Gypsum Board.
  - 19. C919 - Practices for Use of Sealants in Acoustical Applications.
  - 20. C931/C931M - Exterior Gypsum Soffit Board.
  - 21. C954 - Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
  - 22. C1002 - Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - 23. C1047 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - 24. C1178/C1178M - Glass Mat Water-Resistant Gypsum Backing Board.
  - 25. D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

26. D4397 - Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
  27. E84 - Test Method for Surface Burning Characteristics of Building Materials.
  28. E90 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
  29. E119 - Method for Fire Tests of Building Construction and Materials.
  30. E413 - Classification for Rating Sound Insulation.
  31. E488 - Test Method for Strength of Anchors in Concrete and Masonry Elements.
  32. E1190 - Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members.
- C. Gypsum Association (GA):
1. 214 - Recommended Specification: Levels of Gypsum Board Finish.
  2. 216 - Application and Finishing of Gypsum Board.
  3. 600 - Fire Resistance Design Manual.
- D. Underwriters Laboratories (UL):
1. Fire Resistance Directory.
- E. United States Gypsum Co.
1. Gypsum Construction Handbook.

1.03 DEFINITIONS:

- A. Gypsum Board Construction Terminology: Refer to ASTM C11 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.04 SUBMITTALS:

- A. General: Submit in accordance with DIVISION 1.
- B. Product Data for each type of product specified.
- C. Shop Drawings showing locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.
- D. Provide steel stud and anchorage shop drawings.
- E. Product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.
- F. Iron and steel products must be produced in the United States and certifications of such production must be provided to the Owner prior to shipment.

1.05 QUALITY ASSURANCE:

- A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.
- B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- D. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:
1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

2. Gypsum board assemblies indicated are identical to assemblies tested for fire resistance according to ASTM E119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  3. Deflection and Firestop Track: Top runner provided in fire-resistance-rated assemblies indicated is labeled and listed by UL, Intertek Testing Services, or another testing and inspecting agency acceptable to authorities having jurisdiction.
- 1.06 DELIVERY, STORAGE, AND HANDLING:
- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
  - B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- 1.07 PROJECT CONDITIONS:
- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
  - B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40°F (4°C). For adhesive attachment and finishing of gypsum board, maintain not less than 50°F (10°C) for 48 hours before application and continuously after until dry. Do not exceed 95° (35°C) when using temporary heat sources.
  - C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.
- 1.08 WARRANTY
- A. The Manufacturer shall warrant that all assemblies shall be free from defects caused by faulty material or workmanship for a minimum period of two (2) years from the date of Substantial Completion, unless otherwise specified.
  - B. Warranties shall comply with the requirements of Division 1.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS:
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    1. Steel Framing and Furring:
      - a. ClarkDietrich Building Systems.
      - b. Consolidated Systems, Inc.
      - c. National Gypsum Co.; Gold Bond Building Products Division.
      - d. Unimast, Inc.
      - e. The Steel Network.
    2. Gypsum Board and Related Products:
      - a. American Gypsum Co.
      - b. Georgia-Pacific Corp.
      - c. National Gypsum Co.; Gold Bond Building Products Division.
      - d. United States Gypsum Co.
      - e. Certain Teed, a Saint Gobain Company

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

- B. Products: Subject to compliance with requirements, provide one of the following products where proprietary gypsum wallboard is indicated:
  - 1. Firestop Type C; Georgia-Pacific Corp.
  - 2. Fire-Shield G; National Gypsum Co.; Gold Bond Building Products Division.
  - 3. SHEETROCK Brand Gypsum Panels, FIRECODE C Core; United States Gypsum Co.

2.02 STEEL FRAMING FOR INTERIOR PARTITIONS:

- A. General: Provide steel framing members complying with the following requirements:
  - 1. Protective Coating:
    - a. ASTM A653, G40 (ASTM A653M, Z90) hot-dip galvanized coating.
    - b. Manufacturer's standard corrosion-resistant coating.
    - c. ASTM A653, G40 (ASTM A653M, Z90) hot-dip galvanized coating for framing members attached to and within 10 feet (3 m) of exterior walls.
  - B. Steel Studs and Runners: ASTM C645, with flange edges of studs bent back 90° and doubled over to form 3/16 inch (5 mm) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
    - 1. Thickness:
      - a. 18 Gauge.
    - 2. Depth:
      - a. 6 inches, as indicated.
      - b. 8 inches, as indicated.
      - c. 10 inches, as indicated.
  - C. Deflection Track: Manufacturer's top runner complying with the requirements of ASTM C645 and with 3-inch (76.2 mm) deep flanges and 0.0456 inch (1.16 mm - 20 Gauge minimum thickness.
  - D. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web and capable of resisting forces imposed by the wall system.
    - 1. ClarkDetrich Fast Top Clip FTC3 with a slip allowance of 1-1/4".
    - 2. Or approved equal.
  - E. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch (1.5 mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1 mm) wide flanges, 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (45 kg/100 m), unless otherwise indicated.
  - F. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing complying with ASTM A653 (ASTM A653M) or ASTM A568 (ASTM A568M), length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:
    - 1. Thickness:
      - a. 0.0179-inch (0.45 mm), unless otherwise indicated.
  - G. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.
    - 1. All steel stud, runner, and track fastening shall be accomplished using a minimum #12 self-drilling screw, unless noted otherwise. Provide Tek's by ITWBuildex or approved equal.
    - 2. Refer to Drawings for anchoring stud wall to concrete or masonry.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

2.03 GYPSUM BOARD PRODUCTS:

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.
  - 1. Width:
    - a. Provide gypsum board in widths of 48 inches (1219 mm).
- B. Gypsum Wallboard: ASTM C36 and as follows:
  - 1. Type:
    - a. Regular for vertical surfaces, unless otherwise indicated.
    - b. Type X where required for fire-resistance-rated assemblies.
    - c. Sag-resistant type for ceiling surfaces.
    - d. Moisture resistant drywall as indicated on drawings.
  - 2. Edges:
    - a. Tapered.
  - 3. Thickness:
    - a. 5/8-inch (15.9 mm) where indicated.

2.04 TRIM ACCESSORIES:

- A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C1047 and requirements indicated below:
  - 1. Material: Formed metal or plastic, with metal complying with the following requirement:
    - a. Steel sheet zinc coated by hot-dip process or rolled zinc.
  - 2. Shapes indicated below by reference to Fig. 1 designations in ASTM C1047:
    - a. Cornerbead on outside corners, unless otherwise indicated.
    - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
    - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.

2.05 JOINT TREATMENT MATERIALS:

- A. General: Provide joint treatment materials complying with ASTM C475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.
  - 1. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
  - 1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
  - 2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer.
  - 3. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by gypsum board manufacturer.
  - 4. For topping compound, use sandable formulation.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

- D. Moisture-Resistant, Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
  - 1. Ready-Mixed Formulation: Factory-mixed product.
    - a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
    - b. Topping compound formulated for fill (second) and finish (third) coats.
    - c. All-purpose compound formulated for both taping and topping compounds.
  - 2. Job-Mixed Formulation: Powder product for mixing with water at Project Site.
    - a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
    - b. Topping compound formulated for fill (second) and finish (third) coats.
    - c. All-purpose compound formulated for both taping and topping compounds.
  - 3. Basis of Design: DuraBond 90 or Engineer approved equal.

2.06 RIGID INSULATION:

- A. Extruded-Polystyrene Board Insulation: Rigid, cellular, polystyrene thermal insulation with closed cells and integral high-density skin; formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C578, Type IV.
  - 1. Thickness: 1 1/2 inches.
  - 2. R-value: 5 (minimum per inch).
- B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.07 MISCELLANEOUS MATERIALS:

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.
- C. Spot Grout: ASTM C475, setting-type joint compound recommended for spot-grouting hollow metal door frames.
- D. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.
- E. Steel drill screws complying with ASTM C1002 for the following applications:
  - 1. Fastening gypsum board to steel members less than 0.033 inch (0.84 mm) thick.
- F. Foam Gaskets: Closed-cell vinyl foam adhesive-backed strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit metal stud size indicated.
- G. Polyethylene Vapor Retarder: ASTM D4397, thickness and maximum permeance rating as follows:
  - 1. 4 mils (0.1 mm), 0.19 perms (10.9 ng/Pa x s x sq. m).
- H. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

3.03 INSTALLING STEEL FRAMING, GENERAL:

- A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C754 and with ASTM C840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with United States Gypsum Co. "Gypsum Construction Handbook."
- C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with details shown on Drawings.
  - 1. Where building structure abuts ceiling perimeter or penetrates ceiling.
  - 2. Where partition framing and wall furring abut structure, except at floor.
    - a. Provide slip or cushioned-type joints as detailed to attain lateral support and avoid axial loading.
    - b. Install deflection track top runner and vertical deflection clips, as indicated, to attain lateral support and avoid axial loading.
    - c. Install deflection and vertical deflection clips, as indicated, and firestop track top runner at fire-resistance-rated assemblies where indicated.
- D. Do not bridge building control and expansion joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

3.04 INSTALLING STEEL FRAMING FOR WALLS AND CEILINGS:

- A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
  - 1. Where studs are installed directly against exterior walls, install asphalt felt strips or foam gaskets between studs and wall.
- B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8-inch (3 mm) from the plane formed by the faces of adjacent framing.
- C. Secure to structural supports as indicated on the Drawings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
  - 1. Cut studs 1-inch (25 mm) short of full height to provide perimeter relief. Install top track and vertical deflection clips. Fasten vertical deflection clips and top track to primary structure as required. Fasten vertical deflection clips to stud with manufacturer provided hardware in accordance with the manufacturer's instructions. Do not fasten stud to top track.
  - 2. For fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.

- a. Terminate partition framing at suspended ceilings where indicated.
- D. Install steel studs and furring in sizes and at spacings indicated.
  1. Double-Layer Construction: Space studs at 16 inches o.c., unless otherwise indicated.
- E. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.
- F. Frame door openings to comply with GA-600, and with applicable published recommendations of gypsum board manufacturer, unless otherwise indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
  1. Install 2 studs at each jamb, unless otherwise indicated.
  2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint.
- G. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.
- H. Install thermal insulation per specification 07 27 36.
- I. Install polyethylene vapor retarder where indicated to comply with the following requirements:
  1. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with mechanical fasteners or adhesives. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose mineral fiber insulation.
  2. Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners 16 inches (400 mm) o.c.
  3. Seal joints in vapor retarders caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor retarder tape.
  4. Repair any tears or punctures in vapor retarder immediately before concealing it with the installation of gypsum board or other construction.

3.05 APPLYING AND FINISHING GYPSUM BOARD, GENERAL:

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C840 and GA-216.
- B. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.
- E. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- F. Attach gypsum panels to framing provided at openings and cutouts.
- G. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

- H. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.
  - 1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
- I. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- J. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.
  - 1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

3.06 GYPSUM BOARD APPLICATION METHODS:

- A. Single-Layer Application: Install gypsum wallboard panels as follows:
  - 1. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
- B. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
  - 1. Fasten with screws.
- C. Multilayer Fastening Methods: Apply base layers of gypsum panels and face layer to base layers as follows:
  - 1. Fasten both base layers and face layers separately to supports with screws.
- D. Direct-Bonding to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.07 INSTALLING TRIM ACCESSORIES:

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install metal cornerbead at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
  - 1. Install aluminum trim and other accessories where indicated.
- D. Install control joints according to ASTM C840 and manufacturer's recommendations and in specific locations approved by Engineer/Architect for visual effect.

3.08 FINISHING GYPSUM BOARD ASSEMBLIES:

- A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES: continued

- D. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
  - 1. Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
  - 2. Level 2 where panels form substrates for tile and where indicated.
  - 3. Level 4 for gypsum board surfaces, unless otherwise indicated.
- E. For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration.
- F. Where Level 2 gypsum board finish is indicated, embed tape in joint compound and apply first coat of joint compound.
- G. Where Level 1 gypsum board finish is indicated, embed tape in joint compound.
- H. Finish water-resistant gypsum backing board forming base for ceramic tile to comply with ASTM C840 and gypsum board manufacturer's directions for treatment of joints behind tile.
- I. Finish glass-mat, water-resistant gypsum backing board to comply with gypsum board manufacturer's directions.
- J. Finish cementitious backer units to comply with unit manufacturer's directions.

3.09 CLEANING AND PROTECTION:

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09 21 16

## SECTION 09 65 10 - RESILIENT WALL BASE

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes the following:
  - 1. Rubber base.

#### 1.02 REFERENCES:

- A. American Society for Testing and Materials (ASTM):
  - 1. D2240 - Test Method for Rubber Property - Durometer Hardness.
  - 2. F710 - Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
  - 3. F1066 - Vinyl Composition Floor Tile.
  - 4. F1861 - Resilient Wall Base.

#### 1.03 SUBMITTALS:

- A. Submit as specified in DIVISION 1.
- B. Product Data: For each type of product specified.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors available for each type of product indicated.
- D. Samples for Verification:
  - 1. Manufacturer's standard-size samples, but not less than 12 inches (300 mm) long, of each resilient accessory color and pattern specified.
- E. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.

#### 1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: Engage an experienced installer to perform Work of this Section who has specialized in installing resilient products similar to those required for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type, color, and pattern of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver products to Project Site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90°F (10 and 32°C).
- C. Store tiles on flat surfaces.
- D. Move products into spaces where they will be installed at least 72 hours before installation, unless longer conditioning period is recommended in writing by manufacturer.

#### 1.06 PROJECT CONDITIONS:

- A. Maintain a temperature of not less than 70°F (21°C) or more than 95°F (35°C) in spaces to receive products for at least 72 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After post-installation period, maintain a temperature of not less than 55°F (13°C) or more than 95°F (35°C).

SECTION 09 65 10 - RESILIENT WALL BASE: continued

- B. Do not install products until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.
- D. Install tiles and accessories after other finishing operations, including painting, have been completed.
- E. Do not install flooring over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended bond and moisture test.

1.07 EXTRA MATERIALS:

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
  - 1. Furnish not less than one box for each 50 boxes or fraction thereof, of each type, color, pattern, class, wearing surface, and size of resilient tile flooring installed.
  - 2. Furnish not less than 10 linear feet (3 linear m) for each 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient accessory installed.
  - 3. Deliver extra materials to Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Resilient Tile Flooring Schedule at the end of PART 3.
  - 1. Tarkett
  - 2. Armstrong
  - 3. Roppe
  - 4. Or engineer approved equal.

2.02 RESILIENT ACCESSORIES:

- A. Rubber Wall Base: Products complying with ASTM F1861, Type TS (Thermoset).

2.03 INSTALLATION ACCESSORIES:

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examine substrates, areas, and conditions where installation of resilient products will occur, with installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

SECTION 09 65 10 - RESILIENT WALL BASE: continued

3.02 PREPARATION:

- A. General: Comply with resilient product manufacturer's written installation instructions for preparing substrates indicated to receive resilient products.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.03 RESILIENT ACCESSORY INSTALLATION:

- A. General: Install resilient accessories according to manufacturer's written installation instructions.
- B. Apply resilient wall base to walls, columns, pilasters, casework, and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
  - 1. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
  - 2. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
  - 3. Do not stretch base during installation.
  - 4. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
  - 5. Install premolded outside and inside corners before installing straight pieces.
  - 6. Form outside corners on job from straight pieces of maximum lengths possible, without whitening at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
- C. Place resilient accessories so they are butted to adjacent materials and bond to substrates with adhesive. Install reducer strips at edges of flooring that would otherwise be exposed.
- D. Apply resilient products to stairs as indicated and according to manufacturer's written installation instructions.

3.04 CLEANING AND PROTECTING:

- A. Perform the following operations immediately after installing resilient products:
  - 1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
  - 2. Sweep or vacuum floor thoroughly.
  - 3. Do not wash floor until after time period recommended by flooring manufacturer.
  - 4. Damp-mop floor to remove marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by flooring manufacturer.
  - 1. Apply protective floor polish to floor surfaces that are free from soil, visible adhesive and surface blemishes, if recommended in writing by manufacturer.
    - a. Use commercially available product acceptable to flooring manufacturer.
    - b. Coordinate selection of floor polish with Owner's maintenance service.

SECTION 09 65 10 - RESILIENT WALL BASE: continued

2. Cover products installed on floor surfaces with undyed, untreated building paper.
  3. Do not move heavy and sharp objects directly over floor surfaces. Place plywood or hardboard panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean floor surfaces not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations.
1. Before cleaning, strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by flooring manufacturer.
  2. After cleaning, reapply polish to floor surfaces to restore protective floor finish according to flooring manufacturer's written recommendations. Coordinate with Owner's maintenance program.

3.05 RESILIENT TILE FLOORING SCHEDULE:

- A. Rubber Wall Base: Where this designation is indicated, provide rubber wall base complying with the following:
1. Color and Pattern: As selected by Engineer/Architect from manufacturer's full range of colors and patterns produced for rubber wall base complying with requirements indicated.
  2. Style: Cove with top-set toe.
  3. Minimum Thickness: 0.120 inch (3.0 mm).
  4. Height: 4 inches (101.6 mm).
  5. Lengths: Cut lengths 48 inches (1,219.2 mm) long or coils in lengths standard with manufacturer, but not less than 96 feet (29.26 m).
  6. Outside Corners: Premolded.
  7. Inside Corners: Premolded.
  8. Ends: Premolded.
  9. Surface: Smooth.

END OF SECTION 09 65 10

DIVISION 09 – FINISHES

SECTION 09 90 00 – PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes coating of exterior surfaces throughout the Project.
- B. Coating systems include surface preparation, prime coat (first coat), finish coats (second and third coats), inspection, cleaning, and touch-up of surfaces and equipment.
  - 1. Surface preparation is the required degree of preparation prior to application of first (prime) coat.
  - 2. If materials are provided without shop primer such as miscellaneous steel or sheet metal, then surface preparation, first, second, and third coats are a part of field painting.
- C. Colors:
  - 1. Colors of finish coatings shall match accepted color Samples.
  - 2. When second and finish coats of a system are of same type, tint or use an alternate color on second coat to enable visual coverage inspection of the third coat. When first and second coats only are specified and are of same or different types, tint or use an alternate color on first coat to enable visual coverage inspection of the second coat.

1.02 REFERENCES:

- A. Applicable Standards:
  - 1. American National Standards Institute (ANSI):
    - a. A13.1 - Scheme for the Identification of Piping Systems.
    - b. Z53.1 - Safety Color Code for Marking Physical Hazards.
  - 2. American Society for Testing and Materials (ASTM):
    - a. D2092 - Guide for Treatment of Zinc-Coated (Galvanized) Steel Surfaces for Painting.
    - b. D4258 - Surface Cleaning Concrete for Coating.
    - c. D4259 - Abrading Concrete.
    - d. D4260 - Acid Etching Concrete.
    - e. D4261 - Surface Cleaning Concrete Unit Masonry for Coating.
  - 3. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
    - a. SP1 - Solvent Cleaning: Removes oil, grease, soil, drawing and cutting compounds, and other soluble contaminants.
    - b. SP2 - Hand Tool Cleaning: Remove loose material. Not intended to remove adherent mill scale, rust, and paint.
    - c. SP3 - Power Tool Cleaning: Removes loose material. Not intended to remove all scale or rust.
    - d. SP5 - White Metal Blast Cleaning: Removes all scale, rust, foreign matter. Leaves surface gray-white uniform metallic color.
    - e. SP6 - Commercial Blast Cleaning: Two-thirds of every nine square inches free of all visible residues; remainder only light discoloration.
    - f. SP7 - Brush-Off Blast Cleaning: Removes only loose material, remaining surface tight and abraded to give anchor pattern.
    - g. SP10 - Near-White Blast Cleaning: At least 95% of every nine square inches shall be free of all visible residues.
    - h. SP11 - Power Tool Cleaning to Bare Metal.
    - i. SP12 - Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating.

SECTION 09 90 00 – PROTECTIVE COATINGS: continued

- j. SP13 - Surface Preparation of Concrete.
  - 4. NSF International (NSF):
    - a. 61 - Drinking Water Treatment Chemicals - Health Effects.
      - (1) Including Standard 600.
- 1.03 SUBMITTALS:
- A. Submit as specified.
  - B. Includes, but not limited to, the following:
    - 1. Schedule of products and paint systems to be used. Schedule shall include the following information:
      - a. Surfaces for system to be applied.
      - b. Surface preparation method and degree of cleanliness.
      - c. Product manufacturer, name, and number.
      - d. Method of application.
      - e. Dry film mil thickness per coat of coating to be applied.
    - 2. Color charts for selection and acceptance.
    - 3. Technical and material safety data sheets.
    - 4. Certification(s) by coating manufacturer(s) that all coatings are suitable for service intended as stated on each coating system sheet. If manufacturer has an equivalent product as that specified, and it is suitable for the intended purpose, Contractor shall submit the comparative product data for approval at no increase in cost, and state reasons for substitution.
    - 5. Contractor shall certify in writing to the Engineer that applicators have previously applied all the systems in this Specification and have the ability and equipment to prepare the surfaces and apply the coatings correctly.
      - a. Submittals for industrial maintenance coatings shall be prepared by, or have assistance in preparation of, a corrosion engineer or industrial coatings technical representative of the coating manufacturer.
- 1.04 QUALITY ASSURANCE:
- A. Include on label of container:
    - 1. Manufacturer's name, product name, and number.
    - 2. Type of paint and generic name.
    - 3. Color name and number.
    - 4. Storage and temperature limits.
    - 5. Mixing and application instructions, including requirements for precautions which must be taken.
    - 6. Drying, recoat, or curing time.
  - B. Prepainting Conference:
    - 1. Before Project field painting starts, representatives for the Owner, Contractor, coating applicator, and coating manufacturer's technical representative shall meet with Engineer.
    - 2. Agenda for the meeting will include details of surface preparations and coating systems to ensure understanding and agreement by all parties for compliance.
  - C. The contractor shall have a NACE Level 2 certified member on staff.
  - D. A coating report shall be completed daily by Contractor at each phase of the coating system starting with surface preparation. These shall be submitted on the form attached at end of this Section.
  - E. In the event a problem occurs with coating system, surface preparation, or application, Contractor shall require coating applicator and coating manufacturer's technical representative to promptly investigate the problem and submit results to Engineer.

SECTION 09 90 00 – PROTECTIVE COATINGS: continued

- F. Specified VOC shall mean unthinned maximum VOC certified by manufacturer. VOC content as a result of thinning shall not exceed that allowed by federal or local environmental regulations.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Delivery of Materials:
  - 1. Deliver in sealed containers with labels and information legible and intact. Containers shall also have correct labels with required information.
  - 2. Allow sufficient time for testing if required.
- B. Storage of Materials:
  - 1. Store only acceptable materials on Project Site.
  - 2. Provide separate area and suitable containers for storage of coatings and related coating equipment.
  - 3. Dispose of used or leftover containers, thinners, rags, brushes, and rollers in accordance with applicable regulations.

1.06 REGULATORY REQUIREMENTS:

- A. In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the U.S. EPA and the local and regional jurisdictions. Notify Engineer of any coating specified herein that fails to conform to the requirements for the location of the Project or location of application.
- B. Lead Content: Use only coatings that are totally lead free except for zinc-rich primers which shall not have a lead content over 0.06% by weight of nonvolatile content.
- C. Chromate Content: Do not use coatings containing zinc-chromate or strontium chromate.
- D. Asbestos Content: Materials shall not contain asbestos.
- E. Mercury Content: Materials shall not contain mercury or mercury compounds.

1.07 PROJECT CONDITIONS:

- A. If spray-applied, paint could contaminate adjacent building surfaces or vehicles near Site. All containment precautions and application methods shall be taken into consideration and implemented to prevent the above from occurring.
- B. Contractor must protect all mechanical equipment, controls, valves, etc., protect the surrounding environment and fully encapsulate the water tower during surface preparation procedures and coating application.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Proprietary names and product numbers are specified in most systems for material identification from these manufacturers:
  - 1. Sherwin-Williams Company (SW)
  - 2. Tnemec Company, Inc. (TN)

2.02 GENERAL:

- A. Materials furnished for each coating system must be compatible to the substrate.
- B. When unprimed surfaces are to be coated, entire coating system shall be by the same coating manufacturer to assure compatibility of coatings.
- C. When shop-painted surfaces are to be coated, ascertain whether finish materials will be compatible with shop coating. Inform Engineer of any unsuitable substrate or coating conditions.

SECTION 09 90 00 – PROTECTIVE COATINGS: continued

2.03 COATING SYSTEMS:

- A. Specified on the "Protective Coating System" sheets at the end of this Section.

2.04 SURFACES TO BE COATED:

- A. Item: New Steel Water Tower Exterior.

1. Coating System:

- a. Surface Preparation: In accordance with SSPC-SP6/NACE 3 Commercial Blast Cleaning and approved materials removal and containment plan. Clean and dry surface per AWWA D102- 21 Coating Steel Water Storage Tanks
- b. Primer: TN Series 91 or 94 H2O Hydro-Zinc or SW Corothane 1 Galvpac 1K/2K Zinc Primer @ 2.5-3.5 mils D.F.T.
- c. Intermediate Coat: TN Series 73 Endura-Shield or SW Acrolon 218 HS @ 2.0-3.0 mils D.F.T.
- d. Top Coat: TN Series 700 HydroFlon or SW Fluorokem HS 100 @ 2.0-3.0 mils D.F.T. Total D.F.T. of 6.5-9.5 mils minimum.
- e. Top Coat Letters or Logo: TN Series 700 HydroFlon or SW Fluorokem HS 100 @ 2.0-3.0 mils D.F.T.

2. Reference: Drawings.

3. Location: As indicated.

- B. Item: New Steel Water Tower Interiors.

1. Coating System:

- a. Surface Preparation: In accordance with SSPC-SP10/NACE 2 Near White metal Cleaning and approved materials removal and containment plan. Clean and dry surface per AWWA D102-21 Coating Steel Water Storage Tanks.
- b. Primer: TN Series 91 or 94-H2O Hydro-Zinc or SW Corothane I Galvpac 1K/2K @ 2.5-3.5 mils D.F.T.
- c. Stripe Coat: Tnemec Series N140 or Macropoxy 646 PW @ 2.0 – 3.0 mils DFT
- d. Finish Coat (NSF 61 certified, including Standard 600): TN Series 21 Epoxoline or SW SherPlate 600 @ 14.0-18.0 mils for a Total of 16.5-21.5 mils D.F.T.

2. Reference: Drawings.

3. Location: As indicated.

4. Color: Tnemec Tank White or Sherwin-Williams Mill White

- C. Item: Moisture Resistant Gypsum Board Room.

1. Coating System:

- a. Surface Preparation: Clean and dry.
- b. Primer: One coat TN Series 151-1051 Elasto-Grip FC or SW Resuflor Aqua 3477 @ .7-1.5 mils D.F.T.
- c. Finish Coat: 2 coats of TN Series 158 Bio-lastic or SW Loxon XP @ 5.5-7.5 mils D.F.T. per coat for a total of 13 mils D.F.T. minimum.

2. Reference Drawings.

3. Location: As indicated.

4. Wall Color: As selected by engineer.

- D. System E-1:

1. Item: Ductile Iron or Steel Pipe. Interior exposure, exterior of pipe:

- a. Reference: Drawings.
- b. Location: As indicated.

SECTION 09 90 00 – PROTECTIVE COATINGS: continued

2.05 SURFACES NOT TO BE COATED:

- A. Do not field paint any of the following items unless specifically noted otherwise:
  1. Factory finished equipment, except for touch-up. Equipment manufacturer to provide touch-up paint. Field coat shall match existing where applicable.
  2. Metal surfaces of aluminum, stainless steel, copper, bronze and similar finished materials, except where noted.
  3. Heating and ventilation system, except as noted.
  4. Interior and exterior PVC/CPVC and HDPE piping.
  5. Rigid Steel Conduit with PVC coating.

2.06 COLOR CODING OF PIPING AND PHYSICAL HAZARDS:

- A. Color Coding of Piping: Exterior and interior by color coding entire pipe.
  1. General:
    - a. Coat piping with solid colors as specified below for entire length of pipe in exposed finished and unfinished areas. Exclude areas in pipe chases and furred areas.
    - b. Coat all other piping in colors matching adjacent surfaces. If adjacent area is unfinished, paint in color determined by Engineer/Architect.
    - c. Identify piping with legend and arrows as specified below. Apply after completion of finish coating.

2. Color Scheme:

<u>Description</u>	<u>Color</u>	<u>Notes</u>
Potable	Dark Blue	Ref Mechanical/Process Drawings.

- 3. Location of Legends and Arrows:
  - a. Place on piping near connections to Equipment, adjacent to valves or fittings, on both sides of walls penetrated, and at intervals not to exceed 50 feet (15 meters).
  - b. Place arrows adjacent to or below legends depending upon visibility. Place arrows in direction of flow. For dual-flow piping, indicate both directions.
  - c. Locate legends to be visible from normal line of vision above floor level. Legend locations subject to approval of Engineer/Architect.
- 4. Letter Size:
  - a. Block-style letters, all capitals, conforming to ANSI A13.1.
- B. Color Coding of Piping: Exterior and interior by color band.
  1. General:
    - a. Coat piping in colors as selected by Engineer/Architect for entire length of pipe in exposed finished and unfinished areas. Exclude areas above suspended ceilings except for band and legend, in pipe chases and furred areas.
    - b. After completion of finish coating, identify piping with band, legend, and arrow as specified below.

C. Pipe Labeling:

- 1. For most pipe labeling, refer to section 22 05 53. Where not applicable, refer to pipe stenciling parameters below.
- 2. Location of Legends and Arrows:
  - a. Color band, legends, and arrows on piping near connections to Equipment, adjacent to valves or fittings, on both sides of walls penetrated, and at intervals not to exceed 50 feet (15 meters).
  - b. Place arrows adjacent to or below legends depending upon visibility. Place arrows in direction of flow. For dual-flow piping, indicate both directions.

SECTION 09 90 00 – PROTECTIVE COATINGS: continued

- c. Locate legends to be visible from normal line of vision above floor level. Legend locations subject to approval of Engineer/Architect.
- 3. Letter and Band Size:
  - a. Block-style letters, all capitals, conforming to ANSI A13.1, and as follows. Band full circumference of pipe.

<u>Outside Diameter of Pipe or Covering</u>	<u>Width of Banding</u>	<u>Size of Letters and Arrows</u>
Less than 3/4" (19 mm)	6" (150 mm)	Approved metal tag or band
3/4" to 1-1/4" (19 mm to 32 mm)	8" (200 mm)	1/2" (13 mm)
1-1/2" to 2" (38 mm to 50 mm)	10" (250 mm)	3/4" (19 mm)
2-1/2" to 6" (64 mm to 150 mm)	12" (300 mm)	1-1/4" (32 mm)
8" to 10" (200 mm to 250 mm)	24" (600 mm)	2-1/2" (64 mm)
Over 10" (250 mm)	32" (800 mm)	3-1/2" (89 mm)

- D. Color Coding Physical Hazards: Exterior and interior.
  - 1. General:
    - a. Paint areas indicated to identify physical hazard areas as required by ANSI Z53.1.
    - b. All colors shall conform to Federal Safety Color Code requirements.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION:

- A. Prepare surfaces for each coating system conforming to SSPC or ASTM surface preparation specifications listed.
  - 1. If grease or oils are present, SSPC-SP1 shall precede any other method specified for metal substrates.
  - 2. Remove surface irregularities such as weld spatter, burrs, or sharp edges prior to specified surface preparation.
- B. Depth of profile will be as specified or as recommended by the manufacturer for each system, but in no instance shall it exceed one-third of the total dry film thickness of complete system.
- C. Prepare only those areas which will receive the first coat of the system on the same day.
  - 1. On steel substrates, apply coating before rust bloom forms.
- D. For new galvanized steel to be coated, if absence of hexavalent stain inhibitors is not documented, test as described in ASTM D2092, Appendix X2, and remove by one of the methods described therein.

3.02 APPLICATION:

- A. Apply coatings in accordance with coating manufacturer's recommendations.
- B. Use similar containment used for demolition of existing paint for painting of new towers.
- C. Use properly designed brushes, rollers, and spray equipment for all applications.
- D. On unprimed surfaces apply first coat of the system the same day as surface preparation.
- E. Dry film thickness of each system shall be in the range specified. Maximum dry film thickness shall not exceed the minimum more than 20% or coating manufacturer's requirements if less, per SSPC-PA2. Where a dry film thickness range is specified, the range shall not be less than or exceeded.
- F. Shop and field painting shall remain 3 inches away from unprepared surface of any substrate such as areas to be welded or bolted.

SECTION 09 90 00 – PROTECTIVE COATINGS: continued

- G. Environmental Conditions:
  - 1. Atmospheric temperature must be 50°F or higher during application, unless otherwise approved by coating manufacturer. Do not apply coatings when inclement weather or freezing temperature may occur within coating recoat cure times.
  - 2. Wind velocities for exterior applications shall be at a minimum to prevent overspray or fallout and not greater than coating manufacturer's limits.
  - 3. Relative humidity must be less than 85%. The ambient temperature and the temperature of the surface to be painted must be at least 5°F above the dew point.
  - 4. Provide adequate ventilation in all areas of application to ensure that at no time does the content of air exceed the Threshold Limit Value given on the manufacturer's Material Safety Data Sheets for the specific coatings being applied.
- H. Recoat Time: In the event a coating, such as an epoxy, has exceeded its recoat time limit, prepare the applied coating in accordance with manufacturer's recommendations.
- I. Protection:
  - 1. Cover or otherwise protect surfaces not to be painted. Remove protective materials when appropriate.
  - 2. Mask, remove, or otherwise protect finish hardware, machined surfaces, grilles, lighting fixtures, and prefinished units as necessary.
  - 3. Provide cover or shields to prevent surface preparation media and coatings from entering orifices in electrical or mechanical Equipment. Where ventilation systems must be kept in operation at time of surface preparation, take precautions including masking off vents, cell antennas, conduits, cabling and communication equipment to shield intakes and exhausts to prevent the materials from entering system or being dispersed. Re-attach temporary FAA lighting at the end of each work day.
  - 4. Provide signs to indicate fresh paint areas.
  - 5. Provide daily cleanup of both storage and working areas and removal of all paint refuse, trash, rags, and thinners. Dispose of leftover containers, thinners, rags, brushes, and rollers which cannot be reused in accordance with applicable regulations.
  - 6. Do not remove or paint over Equipment data plates, code stamps on piping, or UL fire-rating labels.

3.03 INSPECTION:

- A. Contractor shall provide and use a wet film gauges to check each application approximately every 15 minutes in order to immediately correct film thickness under or over that specified.
- B. Contractor shall provide and use a dry film gauge to check each coat mil thickness when dry, and the total system mil thickness when completed.
- C. Record and submit all Dry Film Thickness (D.F.T.) readings taken after application of each coat. Dry Film Thickness readings to be taken by a NACE II or higher certified inspector.
- D. Furnish a sling psychrometer and perform periodic checks on both relative humidity and temperature limits.
- E. Check air temperature and temperature of the substrate at regular intervals to be certain surface is 5°F or more above the dew point.

3.04 CLEANING AND REPAIRS:

- A. Remove spilled, dripped, or splattered paint from surfaces.
- B. Touch up and restore damaged finishes to original condition. This includes surface preparation and application of coatings specified.

END OF SECTION 09 90 00

SECTION 09 90 00– PROTECTIVE COATINGS: continued

COATING REPORT

Contract Name: \_\_\_\_\_ Contract No.: \_\_\_\_\_  
Coating Contractor: \_\_\_\_\_ Foreman: \_\_\_\_\_

Unit or Surface Identification: \_\_\_\_\_  
Unit or Surface Location: Exterior: \_\_\_\_\_, Interior: \_\_\_\_\_

Surface Preparation:  
Date \_\_\_\_\_; Air Temp \_\_\_\_\_ °F; Relative Humidity \_\_\_\_\_ %  
Method of Surface Preparation: \_\_\_\_\_  
Profile achieved \_\_\_\_\_ mils (if applicable).

Touch-Up:  
Date \_\_\_\_\_; Time \_\_\_\_\_; Air Temp \_\_\_\_\_ °F; Surface Temp \_\_\_\_\_ °F  
Relative Humidity \_\_\_\_\_ %; Dew Point \_\_\_\_\_ °F  
Coating Used \_\_\_\_\_; Dry Film Obtained \_\_\_\_\_ mils.

First Coat:  
Date \_\_\_\_\_; Time \_\_\_\_\_; Air Temp \_\_\_\_\_ °F; Surface Temp \_\_\_\_\_ °F  
Relative Humidity \_\_\_\_\_ %; Dew Point \_\_\_\_\_ °F  
Coating Used \_\_\_\_\_; Dry Time Before Recoat \_\_\_\_\_ hrs.  
Dry Film Obtained \_\_\_\_\_ mils.

Second Coat:  
Date \_\_\_\_\_; Time \_\_\_\_\_; Air Temp \_\_\_\_\_ °F; Surface Temp \_\_\_\_\_ °F  
Relative Humidity \_\_\_\_\_ %; Dew Point \_\_\_\_\_ °F  
Coating Used \_\_\_\_\_; Dry Time Before Recoat \_\_\_\_\_ hrs.  
Dry Film Obtained \_\_\_\_\_ mils.

Third Coat:  
Date \_\_\_\_\_; Time \_\_\_\_\_; Air Temp \_\_\_\_\_ °F; Surface Temp \_\_\_\_\_ °F  
Relative Humidity \_\_\_\_\_ %; Dew Point \_\_\_\_\_ °F  
Coating Used \_\_\_\_\_; Dry Film Obtained \_\_\_\_\_ mils.

		<b>PROTECTIVE COATING SYSTEM</b>	
		System: <b>E-1</b>	
<b><u>SERVICE:</u></b>		Steel & Iron – Nonpotable Liquid Immersion, Normal to Severe Exposure. Interior of Tank or Basin. Exterior of Steel, Piping, or Equipment in Tank or Basin.	
<b>Surface Preparation:</b>		Shop or Field First Coat: SSPC-SP6 and profile depth of 1.5 to 2.5 mils (38 to 63 microns). Field Touch-Up (of Shop-applied first coat): Same as for First Coat.	
<b>First Coat:</b>		High solids amine, polyamidoamine, or polyamide epoxy coating with minimum 67% solids by volume. Apply at 5.0 to 7.0 mils (125 to 175 microns) dry film thickness.	
<b>Second Coat:</b>		Same as first coat.	
<b>System Total:</b>		Minimum 10.0 mils (250 microns) dry film thickness. Check for voids with holiday or pinhole detector.	
<b>Volatile Organic Content:</b>		Maximum 2.8 lb/gal (340 g/L).	
COATING MANUFACTURER	PRODUCT DESIGNATION		
	FIRST COAT	TOUCH UP	SECOND COAT
Sherwin-Williams	Macropoxy 646 FC B58W610/B58V600	Same as first coat	Same as first coat
Tnemec	Hi-Build Epoxoline II Series N69	Same as first coat	Same as first coat

## SECTION 09 96 47 – SPRAY-APPLIED THERMAL BARRIER

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes a thermal barrier coating that shall be applied to all SPRAYED FOAM INSULATING AIR BARRIER SYSTEMS specified in the section indicated below.
- B. Flame Seal-TB™ is an intumescent, industrial, white coating designed for application over spray polyurethane foam (SPF) insulation, which has Intertek, Warnock Hersey and ICC certifications.
- C. Spray polyurethane foam insulation coated with Flame Seal-TB™ will meet the Thermal Barrier requirements of IBC 2603.4 and 2603.9.
- D. The contractor will furnish all labor, materials, tools and equipment necessary for the application of Flame Seal-TB™, including accessory items, subject to the general provisions of the contract.
- E. Related Work Specified Elsewhere:
  - a. SECTION 07 27 36 - SPRAYED FOAM INSULATING AIR BARRIER SYSTEM

#### 1.02 SUBMITTALS

- A. Specialty Products, Inc. to provide datasheets and application guidelines published by FlameSeal, Inc., which include safety, handling, and processing parameter instructions for installation of the material by professional applicators.
- B. Approvals and credentials which show material and application compliance with local or national building codes.

#### 1.03 DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be delivered in tightly sealed containers or unopened packages, all clearly labeled with the Flame Seal-TB name, product identification, and safety information. Flame Seal-TB™ is provided in 5-gallon kits consisting of: One - 5-gallon pail (4 gallons of resin); One - 1 gallon pail T50 cross-linker; 8 ounces “Quick Cure” additive.
- B. Flame Seal-TB™ components should be stored between 40° - 90°F, in tightly sealed containers. If the temperature drops below 60°F, the Flame Seal material must be slowly brought back to 60° - 80°F before using.
- C. All materials shall be stored in compliance with local safety requirements.

#### 1.04 SITE CONDITIONS

- A. All surfaces to be coated are clean and dry.
- B. All equipment for application and clean-up is on site, and as specified in these instructions.
- C. The temperature of all Flame Seal-TB™, T50-TB, and Quick Cure to be used is between 60 -80°F.
- D. The temperature of all surfaces to be coated is at least 5°F ABOVE the dew point.
- E. Maximum humidity does not exceed 90%.
- F. The above temperatures, including coating components and surfaces will remain in spec throughout the day.
- G. The surfaces will remain at least 5°F above the dew point for a minimum of 48 hours after application. (For cold storage or freezers, this cure period is extended to 4-7 days, in accordance with manufacturer’s Application Instructions.)

#### 1.05 SAFETY REQUIREMENTS

- A. Applicator personal protective equipment should be worn according to OSHA standards:

SECTION 09 96 47 – SPRAY-APPLIED THERMAL BARRIER: continued

- a. An Organic Vapor Cartridge Respirator
  - b. Safety Glasses
  - c. Gloves
  - d. Protective Coveralls
- B. Proper disposal of waste materials and containers must be done in compliance with federal, state and local regulatory agencies.

1.06 WARRANTY

- A. The Manufacturer shall warrant that the whole assembly shall be free from defects caused by faulty material or workmanship for a minimum period of two (2) years from the date of Substantial Completion, unless otherwise specified.
- B. Warranties shall comply with the requirements of Division 1.

PART 2 - PRODUCTS

2.01 SPRAY-APPLIED THERMAL BARRIER AND INTUMESCENT COATING

- A. Flame Seal-TB™ is a three-component, intumescent, industrial, white coating designed for application over spray polyurethane foam insulation. Flame Seal-TB™ is manufactured by Flame Seal, Inc. and supplied by Specialty Products, Inc.

PART 3 - EXECUTION

3.01 SITE QUALITY CONTROL

- A. Material Thickness:
  - a. Thermal Barrier: Material coverage applied at 25 wet mils (18 dry mils) to meet Thermal Barrier Requirements of IBC 2603.4 and 2603.9.
  - b. Ignition Barrier: Material coverage applied at 12 wet mils (7 dry mils) to meet Ignition Barrier Requirements of IBC 2603.4.1.6.
- B. Architect or architect's representative to be alerted to product installation and is required to confirm installation before product is concealed.
- C. Environment:
  - a. Air Movement During Application: To facilitate a proper cure, there must be air movement in the application area during the installation and cure period. In mid-to-high humidity conditions (70-90%), extra care must be taken to ensure air movement, especially over all spray polyurethane foam applied to ceiling areas. The application of Flame Seal-TB™ is not permissible if there is stagnant and still air in high humidity (70+% conditions). Portable auxiliary fans are recommended during installation and cure periods to assure airmovement.
  - b. Extreme Conditions-Humidity and Moisture Generated by On-Site Mechanical Equipment: When applying Flame Seal-TB™ in areas with extremely high humidity and/or moisture conditions during installation and curing, there must be higher volume, continuous air movement that will visibly move a 1" x 18" strip of cotton fabric held vertically near the ceiling. A 1" x 18" strip of cotton fabric, hung at the ceiling level, one strip for every 400 sq. ft. (20'x20') of ceiling area is a field monitoring recommendation. Every strip in the application area (at least 1"

SECTION 09 96 47 – SPRAY-APPLIED THERMAL BARRIER: continued

deflection at bottom edge) should move for the duration of the application and the applicable cure period. Auxiliary fans are recommended in the work area during installation and cure periods.

- c. Water Exposure: Flame Seal-TB™ is an interior product. DO NOT immerse or expose to any environment in which the surface is wet continuously. (This includes condensation caused by interior conditions whereby surface temperatures are at or below the DewPoint much of the time.)

3.02 EQUIPMENT

A. Flame Seal-TB™ is to be installed using a commercial airless paint pump that meets the following specifications:

- a. 3 HP Electric Motor (or); 5 HP Gas powered (or); 30 to 1 Air Driven
- b. Output capability of 1.5 gallons per minute with 3000 PSI (dynamic) at the gun
- c. Graco RAC tip size should be between .027 - .031 - determined by paint pump capability
- d. Hose(s) must be at least 3/8 ID and no more than 150 feet in total length

NOTE: Do not use a spray tip with a diffuser. Remove paint strainers from the spray pump and gun, as they may restrict the flow of Flame Seal product. Flame Seal-TB™ is pre-strained through an 80 mesh filter.

3.03 INSTALLATION

A. Flame Seal-TB™ must be installed in accordance with the manufacturer's published installation instructions.

3.04 MAINTENANCE

A. Washing: Flame Seal-TB™ has cured enough to lightly wash with "wet soft rag or sponge" (1-2 passes, no scrubbing), after 4 weeks of curing under proper conditions as stipulated in these instructions (all surfaces at least 5° above the dew point, ventilation & air movement) Flame Seal-TB™ has cured enough for intermittent, light water exposure after 3 months of curing with all surfaces at least 5° above the dew point. (This may take longer with variations in dew point conditions.) Only light mist or dispersed water (wide spray pattern of at least 24") may be used to clean this coating. The spray pattern must be at least 24" wide and must be moving at all times. Do not focus on one spot for more than a few seconds at a time. If heavy dirt does not come off with these methods, use dispersed water (24"+ spray pattern) to remove loose dirt, then wipe stubborn areas with wet sponge type apparatus, then, rinse again with mist or dispersed water, and let air dry. Do not dry with cloth or sponges. If there is a need to force a quicker dry, use warm, dry moving air (convection).

END OF SECTION 09 96 47

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

SECTION 23 05 13 – COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 SUMMARY:

- A. Section includes general requirements for single-phase, general-purpose motors for use on ac power systems up to 600V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.03 REFERENCE STANDARDS:

- A. Applicable Standards (latest edition):
  - 1. National Electrical Manufacturers Association (NEMA):
    - a. NEMA MG 1 - Motors and Generators.

1.04 COORDINATION:

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
  - 1. Motor controllers.
  - 2. Torque, speed, and horsepower requirements of the load.
  - 3. Ratings and characteristics of supply circuit and required control sequence.
  - 4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.01 GENERAL MOTOR REQUIREMENTS:

- A. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.

2.02 MOTOR CHARACTERISTICS:

- A. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.03 SINGLE-PHASE MOTORS:

- A. Motors 1/20 HP and Smaller: Shaded-pole type.
- B. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 23 05 13

SECTION 23 05 53 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.02 SUMMARY:
- A. This Section includes:
    - 1. Equipment labels.
- 1.03 REFERENCE STANDARDS:
- A. Applicable Standards (Latest Edition):
    - 1. American Society of Mechanical Engineers (ASME):
      - a. ASME A13.1 - Scheme for the Identification of Piping Systems.
- 1.04 SUBMITTALS:
- A. Product Data: For each type of product indicated.
- 1.05 COORDINATION:
- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

PART 2 - PRODUCTS

- 2.01 EQUIPMENT LABELS:
- A. Metal Labels for Equipment:
    - 1. Material and Thickness: Aluminum, 0.032 inch minimum thickness, and having an adhesive backing for attachment hardware.
    - 2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inches.
    - 3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
    - 4. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
  - B. Label Content: Include equipment's Drawing designation or unique equipment number.

PART 3 - EXECUTION

- 3.01 PREPARATION:
- A. Clean equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.
- 3.02 EQUIPMENT LABEL INSTALLATION:
- A. Install or permanently fasten labels on each major item of mechanical equipment.
  - B. Locate equipment labels where accessible and visible.

END OF SECTION 23 05 53

## SECTION 23 82 39 - UNIT HEATERS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

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

#### 1.02 SUMMARY:

- A. This Section includes:
  - 1. Propeller unit heaters with electric-resistance heating coils.

#### 1.03 REFERENCE STANDARDS:

- A. Applicable Standards (Latest Edition):
  - 1. Air-Conditioning, Heating, & Refrigeration Institute (AHRI):
    - a. AHRI 440 – Performance Rating of Room Fan-Coils.
  - 2. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
    - a. ASHRAE 33 - Method of Testing Forced-Circulation Air-Cooling and Air-Heating Coils (ANSI).
    - b. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter (ANSI).
    - c. ASHRAE 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size (ANSI).
    - d. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality (ANSI).
  - 3. American Society of Heating, Refrigerating and Air-Conditioning Engineers/Illuminating Engineering Society of North America (ASHRAE/IESNA):
    - a. ASHRAE/IESNA 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings (ANSI).
  - 4. ASTM International (ASTM):
    - a. ASTM C411 – Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
    - b. ASTM C534 – Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
    - c. ASTM C916 – Standard Specification for Adhesives for Duct Thermal Insulation.
    - d. ASTM C1071 – Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
    - e. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 5. National Fire Protection Association (NFPA):
    - a. NFPA 70 - National Electrical Code.
    - b. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
    - c. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems (ANSI).
  - 6. Underwriters Laboratories, Inc. (UL):
    - a. UL 823 - Standard for Electric Heaters for Use in Hazardous (Classified) Locations.
    - b. UL 1995 - Heating and Cooling Equipment.
    - c. UL 2021 - Fixed and Location-Dedicated Electric Room Heaters.

#### 1.04 SUBMITTALS:

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each product indicated.

SECTION 23 82 39 – UNIT HEATERS: CONTINUED

- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
    - 1. Equipment schedules to include rated capacities, operating characteristics, furnished specialties, and accessories.
    - 2. Wiring Diagrams: Power, signal, and control wiring.
  - C. Field quality-control test reports.
  - D. Operation and Maintenance Data: For cabinet unit heaters to include in emergency, operation, and maintenance manuals.
- 1.05 QUALITY ASSURANCE:
- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
  - B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

PART 2 - PRODUCTS

- 2.01 PROPELLER UNIT HEATERS:
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - 1. Daikin Applied.
    - 2. Dayton.
    - 3. Modine Manufacturing Company.
    - 4. QMark Electric Heating; a division of Marley Engineered Products.
    - 5. Trane.
    - 6. Engineer Approved Equal.
  - B. Description: An assembly including casing, coil, fan, and motor in horizontal discharge configuration with adjustable discharge louvers.
  - C. Comply with UL 823 and UL 2021.
  - D. Cabinet Finish: Manufacturer's standard baked enamel applied to factory-assembled and - tested propeller unit heater before shipping.
  - E. Discharge Louver: Adjustable fin diffuser.
  - F. Electric-Resistance Heating Elements: Nickel-chromium heating wire, free from expansion noise and 60-Hz hum, embedded in magnesium oxide refractory and sealed in steel or corrosion-resistant metallic sheath with fins no closer than 0.16 inch. Element ends shall be enclosed in terminal box. Fin surface temperature shall not exceed 550°F at any point during normal operation.
    - 1. Circuit Protection: One-time fuses in terminal box for overcurrent protection and limit controls for high-temperature protection of heaters.
    - 2. Wiring Terminations: Stainless-steel or corrosion-resistant material.
  - G. Fan: Propeller type with aluminum wheel directly mounted on motor shaft in the fan venturi.
  - H. Fan Motors: Comply with requirements in Section 23 05 13 - Common Motor Requirements for HVAC Equipment.
  - I. Control Devices:
    - 1. Unit-mounted thermostat.
  - J. Capacities and Characteristics: As scheduled on the Drawings.

SECTION 23 82 39 – UNIT HEATERS: CONTINUED

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examine areas to receive unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in for electrical connections to verify actual locations before unit heater installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

- A. Install propeller unit heaters level and plumb.
- B. Suspend propeller unit heaters from structure with manufacturer provided wall-mounting bracket kit.

3.03 CONNECTIONS:

- A. Comply with safety requirements in UL 1995.
- B. Ground equipment according to DIVISION 26.
- C. Connect wiring according to DIVISION 26.

3.04 FIELD QUALITY CONTROL:

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
  - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - 2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
  - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
- C. Remove and replace malfunctioning units and retest as specified above.

3.05 ADJUSTING:

- A. Adjust initial temperature set points.
- B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.06 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain cabinet unit heaters. Refer to DIVISION 01.

END OF SECTION 23 82 39

## SECTION 26 05 10 – GENERAL ELECTRICAL REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. This Section specifies general administrative and procedural requirements for electrical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 01:
  - 1. Submittals.
  - 2. Coordination drawings.
  - 3. Record documents.
  - 4. Maintenance manuals.
  - 5. Rough-ins.
  - 6. Electrical installations.
  - 7. Cutting and patching.
  - 8. Electrical Demolition.
  - 9. Touch-up Painting.

#### 1.02 SUMMARY:

- A. This Contract includes, but is not limited to, the following systems:
  - 1. 480V, 3-phase, 60 hertz, 3 wire power systems.
  - 2. 208Y/120 V, 3-phase, 60 hertz, 4-wire lighting, convenience power, and small power system.
  - 3. Grounding systems.
  - 4. Control systems.
  - 5. Underground conduit system, including handholes.
  - 6. Temporary lighting and convenience power facilities during construction.
  - 7. Underground duct banks, including handholes and manholes.
  - 8. Instrumentation systems.

#### 1.03 RELATED REQUIREMENTS:

- A. Division 31 for excavation for electrical installations within the building boundaries and from building to utility connections.
- B. Section 23 05 13 - Common Motors Requirements for HVAC Equipment for factory-installed motors, controllers, accessories, and connections.

#### 1.04 REFERENCE STANDARDS:

- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- B. Federal Information Processing Standards Publication (FIPS).
- C. National Electrical Contractors Association (NECA).
- D. National Electrical Installation Standards (NEIS): Except where the NEIS requirements specifically deviate from specific requirements of the NEC, the NEC shall take precedence.
- E. National Fire Protection Association (NFPA):

SECTION 26 05 10 – GENERAL ELECTRICAL REQUIREMENTS: continued

- 1. NFPA - 70 National Electrical Code (NEC).
- F. Institute of Electrical and Electronics Engineers (IEEE):
  - 1. IEEE C2 National Electrical Safety Code (NESC).
- G. Underwriters Laboratories (UL).

1.05 SUBMITTALS:

- A. Submit as specified in Division 01.
- B. Refer to each Section of this Division for specific Submittal requirements.
- C. Provide Conforming to Construction Records schematic diagrams and wiring diagrams.
- D. Provide product data on electrical material and products.
- E. Prepare record documents in accordance with the requirements in Section 01 78 00 - Contract Closeout. In addition to the requirements specified in Division 01, indicate installed conditions for:
  - 1. Major raceway systems, size and location for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; fuse sizes, circuit breaker sizes and arrangements.
  - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
  - 3. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
- F. Prepare operation and maintenance manuals in accordance with Section 01 78 00 - Contract Closeout. In addition to the requirements specified in Division 01, include the following information for equipment items:
  - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data, tests, and complete nomenclature and commercial numbers of replacement parts.
  - 2. Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; lockout/tagout procedures; and summer and winter operating instructions.
  - 3. Maintenance procedures for routine preventive maintenance and troubleshooting; disassembly, repair, reassembly; aligning and adjusting instructions.
  - 4. Servicing instructions, lubrication charts and schedules.
  - 5. "Conforming to Construction Records" schematic and wiring diagrams.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver products to the Project Site properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

1.07 WARRANTY:

- A. See Division 01 for warranty information.

PART 2 - PRODUCTS

2.01 PRODUCTS:

- A. Unless indicated otherwise, all equipment and material shall be new, undamaged and meet the requirements of Underwriters Laboratories, Inc. (UL). Where UL requirements are not applicable, equipment and material shall be identified as such by Contractor and approved by Owner before purchase and installation.

2.02 ELECTRONIC EQUIPMENT COMPLIANCE:

- A. Contractor warrants that all equipment, devices, items, systems, software, hardware, or firmware provided shall properly, appropriately, and consistently function and accurately process date and time data (including without limitation: calculating, comparing, and sequencing). This warranty supersedes anything in the Specifications or other Contract Documents which might be construed inconsistently. This warranty is applicable whether the equipment, device, item, system, software, hardware, or firmware is specified with or without reference to a manufacturer's name, make, or model number.

2.03 FINISHES:

- A. For equipment: Equipment manufacturer's paint selected to match installed equipment finish.
- B. Galvanized surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.01 ERECTION, INSTALLATION, APPLICATION:

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications in Division 26 and the equipment submittals for rough-in requirements.
- C. Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. All electrical work and material shall comply with the following requirements:
  - 1. NFPA 70 - The National Electrical Code (NEC).
  - 2. IEEE C2, National Electrical Safety Code, Federal Information Processing Standards Publication (FIPS).
  - 3. NECA National Electrical Installation Standards (NEIS) (all except Table 1 of NECA 1).
  - 4. Coordinate electrical systems, equipment, and materials installation with other building components. Equipment motor horsepower sizes and kilowatt sizes if shown are approximate. If equipment of a different size is furnished by Contractor, Contractor shall furnish and install the proper support equipment, motor starter, switchgear, feeders, fuses, circuit breaker, disconnect switch, wire, and conduit required for the equipment furnished, at no additional cost to Owner.
  - 5. Verify all existing dimensions by field measurements.

SECTION 26 05 10 – GENERAL ELECTRICAL REQUIREMENTS: continued

6. Arrange for chases, slots, and openings in other building components during progress of construction to allow for electrical installations.
  7. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components as they are constructed.
  8. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building. Coordinate concrete pads, bases, roof curbs, and related items.
  9. Coordinate with all other building trades.
  10. Where mounting heights are not specifically detailed, specified, or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
  11. Coordinate connection of electrical systems with exterior underground utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
  12. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Should coordination requirements conflict with individual system requirements, refer conflict to Owner's Representative in writing.
  13. Install systems, materials, and equipment level, plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
  14. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting with minimum of interference with other installations.
  15. All equipment conductor termination provisions shall be UL listed for 75°C conductors.
  16. All electrical equipment and installations shall be of adequate strength to withstand, without failure, forces encountered in defined Seismic conditions.
  17. Install raceways, cables, wireways, cable trays and busways clear of obstructions and clear of the required working space of equipment.
- D. Refer to each section of this Division for specific performance requirements.

3.02 WORK ON EXISTING EQUIPMENT:

- A. Do not remove any equipment from service without obtaining permission from Owner and Engineer.
- B. Perform work that requires taking equipment out of service at times designated by Owner to cause minimum interruption in plant operation.
- C. Continue work with as many workmen as can be efficiently utilized from the time any equipment is removed from service until equipment is tested and back in service.
- D. Connect electrical Equipment to provide same phasing as existing equipment, unless otherwise specified or indicated.

SECTION 26 05 10 – GENERAL ELECTRICAL REQUIREMENTS: continued

3.03 TESTING:

- A. Test all electrical Equipment upon completion of installation to ensure that the Equipment operates satisfactorily and conforms to Contract Documents.
- B. Furnish temporary power sources of proper type for testing purposes when normal supply is not available at the time of testing.

3.04 DEMOLITION:

- A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.
- C. Abandoned Work: Cut and remove buried raceway and wiring indicated to be abandoned in place, 2 inches below surface of adjacent construction. Cap raceways and patch surface to match existing surface finish.
- D. Remove demolished material from Project Site.
- E. Remove, store, clean, re-install, reconnect and make operational components indicated for relocation.

3.05 CUTTING AND PATCHING:

- A. General: Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of the trades involved. Perform cutting and patching in accordance with Section 01 73 29 - Cutting and Patching. In addition to the requirements specified in Division 01, the following requirements apply:
  - 1. Perform cutting and patching for electrical equipment and materials required to:
    - a. Uncover work to provide for installation of ill-timed work.
    - b. Remove and replace defective work.
    - c. Remove and replace work not conforming to requirements of the Contract Documents.
    - d. Remove samples of installed work as specified for testing.
    - e. Install equipment and materials in existing structures.
    - f. Upon written instructions from Engineer, uncover and restore work to provide for Engineer's observation of concealed work if installed without using the proper specified procedures.
- B. For work in existing installations, the Contractor shall cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including, but not limited to, removal of electrical items indicated to be removed and items made obsolete by the new work.
- C. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- D. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
- E. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

SECTION 26 05 10 – GENERAL ELECTRICAL REQUIREMENTS: continued

- F. All penetrations through fire-rated walls, ceilings and floors shall be sealed with a UL listed and FM Global approved sealant system that matches the fire rating of the surface penetrated.
- G. Patch existing finished surfaces and building components that must be cut for the electrical installation or are damaged by Contractor using new materials matching existing materials.
- H. All cutting, patching, and repairing shall be subject to the supervision and the approval of Owner's Representative.
- I. Repair and re-finish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fire proofing where existing fireproofing has been disturbed. Repair and re-finish materials and other surfaces by skilled mechanics of trades involved.

3.06 FINISHES:

- A. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit degree of damage at each location.
- B. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
- C. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- D. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.07 CLEANING:

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

3.08 PROTECTION:

- A. Protect equipment and installations and maintain conditions to ensure that coatings, finishes and cabinets are without damage or deterioration at time of Substantial Completion.

3.09 CLOSEOUT:

- A. Instructions, training, and manufacturer's service representative:
  - 1. Provide on-site instructions and training of Owner's personnel as specified.
  - 2. Provide on-site services of a manufacturer's authorized service representative as specified.

END OF SECTION 26 05 10

## SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes furnishing and installing including terminations of all electrical wire, cable, and accessories.
- B. Definition:
  - 1. Burns & McDonnell type designations, such as "SVN3," "CEV1," and "BC1" indicated or specified, are for identification purposes only and are not intended to correspond to any trade designation.
- C. Related Work Specified Elsewhere:
  - 1. Section 26 05 26 - Grounding and Bonding of Electrical Systems.
  - 2. Section 26 27 26 - Wiring Devices
  - 3. Section 26 50 00 - Lighting Devices.
  - 4. Instruments and Controls: DIVISION 40.

#### 1.02 REFERENCES:

- A. Applicable Standards:
  - 1. American Society for Testing and Materials (ASTM):
    - a. B3 - Soft or Annealed Copper Wire.
    - b. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
    - c. B33 - Tinned Soft or Annealed Copper Wire for Electrical Purposes.
    - d. B172 - Rope-Lay-Stranded Copper Conductors, Having Bunch Stranded Members, for Electrical Conductors.
    - e. B189 - Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes.
  - 2. Insulated Cable Engineers Association (ICEA):
    - a. S-81-570 - 600-Volt Rated Cables of Ruggedized Design for Direct Burial Installations as Single Conductors or Assemblies of Single Conductors.
    - b. S-105-692 - 600-Volt Single Layer Thermoset Insulated Utility Underground Distribution Cables.
    - c. T-29-520 - Vertical Cable Tray Flame Tests at 210,000 Btu.
  - 3. National Electric Manufacturers Association (NEMA) and Insulated Cable Engineers Association (ICEA):
    - a. WC55/S-82-552 - Instrumentation Cables and T.C. Wire.
    - b. WC57/S-73-532 - Standard for Control Cables.
    - c. WC70/S-95-658 - Non-Shielded Power Cables Rated 2000V or Less.
  - 4. Institute of Electrical and Electronic Engineers (IEEE):
    - a. 48 - Test Procedures and Requirements for High Voltage Alternating-Current Cable Terminations.
  - 5. National Fire Protection Association (NFPA):
    - a. 70 - National Electrical Code (NEC).
  - 6. Underwriters Laboratories, Inc. (UL):

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES: continued

- a. 44 - Rubber-Insulated Wires and Cables.
- b. 83 - Thermoplastic-Insulated Wires and Cables.
- c. 263 - Fire Tests of Building Construction and Materials.
- d. 854 - Service Entrance Cables.
- e. 1277 - Electrical Power and Control Tray Cables with Optional Optical Fiber Members.

1.03 SUBMITTALS:

- A. Submit as specified in DIVISION 1.
- B. Includes, but not limited to, the following:
  1. Data sheets for each wire and cable type specified.
  2. Data sheets for wire and cable accessories.
  3. Cable manufacturer's approval of splicing and terminating materials.
  4. Cable manufacturer's approval of pulling compounds.
  5. Cable manufacturer's installation requirements such as maximum pulling tensions, sidewall pressures, minimum bending radii, and other considerations.
  6. Other Equipment and Materials to be used.

PART 2 - PRODUCTS:

2.01 ACCEPTABLE MANUFACTURERS:

- A. Wire and Cable: Acceptable manufacturers for each wire and cable type will be manufacturers that have been manufacturing the specified cable for a minimum of five years and meet all the requirements listed on the Wire and Cable Specification Sheets.
- B. Wire and Cable Accessories:
  1. Cable Connectors for Control and Instrument Cable:
    - a. AMP Special Industries.
    - b. Hollingsworth Solderless Terminal Company.
    - c. Panduit Corporation.
    - d. Minnesota Mining and Manufacturing (3M).
    - e. Thomas and Betts Company, Inc.
  2. Cable Connectors for Power Cable:
    - a. AMP Special Industries.
    - b. Thomas and Betts Company, Inc.
    - c. Minnesota Mining and Manufacturing (3M).
    - d. Panduit Corporation.
  3. Termination and Splice Kits:
    - a. Minnesota Mining and Manufacturing (3M).
    - b. Raychem.
  4. Tape and Insulation Putty: Minnesota Mining and Manufacturing (3M).
  5. Cable Ties:
    - a. AMP Special Industries.
    - b. Dennison Manufacturing Company.
    - c. Panduit Corporation.
    - d. Minnesota Mining and Manufacturing (3M).

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES: continued

- e. Thomas and Betts Company, Inc.
- 6. Cable Supports:
  - a. O. Z./Gedney Company.
  - b. Hubbell, Kellems Grips.
- 7. Terminal Blocks:
  - a. Allen Bradley.
  - b. Buchanan.
  - c. Phoenix Contact.
  - d. Square D Company.
  - e. Weidmuller.
- 8. Cable Identification Tags:
  - a. Brady Worldwide.
  - b. Panduit Corporation (Panduit).
  - c. Thomas and Betts Company, Inc. (Thomas and Betts).
- 9. Cable Fire and Smoke Stop Fittings:
  - a. Crouse Hinds.
  - b. Nelson Electric.
  - c. O. Z./Gedney Company.
- 10. Fireproofing (Arc-Proofing) Tape:
  - a. 3M.

2.02 WIRE AND CABLE:

- A. Wire and cable shall be furnished in accordance with the specification sheets at the end of this Section.

2.03 CONNECTORS:

- A. General Requirements:
  - 1. Designed and sized for specific cable being connected.
  - 2. Solderless, pressure-type connectors constructed of noncorrodible tin-plated copper.
  - 3. Application tooling for connectors shall contain die or piston stops to prevent over-crimping and cycling or pressure relief to prevent under-crimping. Dies of all application tooling shall provide dot or wire size coding for quality control verification. All tooling shall be manufactured by the connector manufacturer.
- B. Power Connectors (10 AWG and Smaller) 600V and Below:
  - 1. "Scotchlok" preinsulated spring wire connectors.
  - 2. Buchanan open-end copper splicing caps, applied with "Lok-Seal" tool, with nylon snap-on insulators.
- C. Power Connectors (sizes 8-4 AWG) 600V and Below:
  - 1. Noninsulated ring-tongue type.
  - 2. Ring tongue sized to match terminal stud size.
  - 3. Brazed barrel seam.
  - 4. Application tooling designed to crimp the wire barrel (conductor grip) with a one-step crimp.
- D. Power Connectors (sizes 2 AWG - 750 MCM) 600V and Below:

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES: continued

1. Noninsulated one-hole rectangular tongue for sizes 2 AWG through 3/0 AWG and two-hole rectangular tongue for 4/0 AWG through 750 MCM.
  2. Application tooling shall be hydraulically operated.
  - E. Power Connectors (sizes 2 AWG - 750 MCM) above 600V:
    1. Noninsulated one-hole rectangular tongue for sizes 2 AWG through 3/0 AWG and two-hole rectangular tongue for 4/0 AWG through 750 MCM.
    2. Voltage rating equal or greater than that of the cable being used.
    3. Application tooling shall be hydraulically operated.
  - F. Control, Instrument, and Specialty Cable Connectors:
    1. Tin-plated copper.
    2. Vinyl or nylon preinsulated ring-tongue type. Spade lugs will not be permitted.
    3. Sized to match terminal stud size.
    4. Have insulation grip sleeve to firmly hold to cable insulation.
    5. Insulation grip sleeve shall be funneled to facilitate wire insertion and prevent turned-back strands.
    6. Application tooling designed to crimp the wire barrel (conductor grip) and the insulation grip sleeve with a one-step crimp.
- 2.04 CABLE SUPPORTS:
- A. Cable supports for cables in vertical conduit risers shall be O. Z./Gedney Type "R" wedging plug type or approved equal.
  - B. Kellem basket type wire mesh grip for cables in vertical cable tray.
- 2.05 CABLE TIES:
- A. Nylon self-locking type.
  - B. Have a normal service temperature range of -40°C to 85°C.
  - C. Be weather-resistant type for outdoor use.
  - D. Meet requirements of Military Specifications MIL-S-23190D.
  - E. AMP Special Industries "AMP-TY," Dennison Manufacturing Company "BAR-LOK," Panduit Corporation "PAN-TY," Thomas & Betts "TY-RAP," or Minnesota Mining and Manufacturing 3M Brand cable ties.
- 2.06 TERMINAL BLOCKS:
- A. For mounting in terminal boxes (TBs):
    1. Designed and sized for the cables being terminated.
    2. Block rated 600V.
    3. Binding screw-type terminals for power cables and strap screw or tubular clamp terminals for control and instrument cables.
    4. Rated current carrying capacity equal to or greater than the cable being terminated.
    5. Marking strip.
- 2.07 CABLE IDENTIFICATION TAGS:
- A. Designed to provide a permanent wire and cable identification system.

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES: continued

- B. Show complete cable number. Cable numbers are defined in the Cable Schedule and/or Contract Drawings.
- C. Cable numbers shall be stamped or typed.
- D. Character size for cable numbers shall be a minimum of 1/8-inch.
- E. Material shall be nonmetallic and impervious to moisture.
- F. Be securely attached to cables and accessible for inspection.
- G. Cable identification tags, marking and attachment methods shall be subject to approval of Engineer.

2.08 CABLE FIRE AND SMOKE STOP FITTINGS:

- A. Rating shall equal or exceed the fire rating of the fire wall, floor, or ceiling penetrated.
- B. Fitting shall be sized for cable diameter and quantity of cable installed.
- C. Fitting shall be UL labeled.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Wire and Cable:
  - 1. General Requirements:
    - a. Install in conduit, tray, or duct system as indicated.
    - b. Do not subject cable to pulling tensions or sidewall pressures in excess of manufacturer's recommendations.
    - c. Attach pulling grips over the cable sheath to prevent slipping of the insulation.
    - d. Do not subject cable to bending radius less than those recommended by the cable manufacturer or as noted below (whichever is greater) during or after installation:
      - (1) Eight times the cable outside diameter for 600V or lower rated cables.
    - e. Install intermediate pull boxes as indicated or as required to avoid subjecting cable to excessive pulling tension or sidewall pressures.
    - f. Support cables at connections or termination points such that any strain on cable will not be transmitted to the connection or termination.
    - g. Install cable supports in vertical runs of tray or conduit, at boxes and at terminations in equipment, and as required to meet intermediate support requirements of National Electrical Code (NEC).
    - h. All pulling compounds shall be approved by wire and cable manufacturer as being compatible with cable materials.
    - i. Attach a cable identification tag to each cable at all termination or end points.
    - j. Install fire and smoke stop fittings at all cable penetrations of fire rated walls, floors, and ceilings.

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES: continued

2. Power (600V and Below), Control, Instrument, and Specialty Cable:
  - a. Install metallic barrier in all tray and boxes to separate power, control, and instrumentation from low-level signal (50V or less) instrumentation circuits where run in the same tray or box.
  - b. Secure with cable ties in cable tray risers at intervals not to exceed 3 feet.
  - c. Tie together with cable ties all single conductor cable on each individual circuit in each junction box, equipment or manhole, and in cable tray, at intervals not to exceed 6 feet.
  - d. Attach a cable identification tag to each cable.
    - (1) At each terminal to identify the circuit and cable.
    - (2) Attach fiber tags with cable ties.
    - (3) Use nylon ties and identification tabs color coded as follows:
      - (a) 480V circuits - Red.
      - (b) 277, 240, or 208Vac circuits - Orange.
      - (c) 120V circuits - White.
      - (d) Control cables - Natural Nylon.
  - e. Insulation Color Coding for Phase Identification:
    - (1) Color code 600-volt insulated, service entrance, feeder, and branch circuit conductors with factory-applied colored insulation for No. 8 AWG and smaller (except: No. 6 AWG and smaller for green ground wire); 1-inch band of colored tape at all splices and terminations for No. 6 AWG and larger (except: No. 4 AWG and larger for green ground wire) as follows:

<u>Phase</u>	<u>208Y/120V AC</u>	<u>480Y/277V AC</u>	<u>125V DC</u>
A	Black	Brown	NA
B	Red	Orange	NA
C	Blue	Yellow	NA
Neutral	White	Gray	NA
Ground	Green	Green	NA
(+)	N/A	NA	Red
(-)	N/A	NA	Black

- f. Tag each individual conductor or wire with wire markers as follows:
  - (1) With terminal designation indicated on schematic diagrams or given on manufacturer's equipment drawings.
  - (2) At each terminal.
  - (3) In addition to specified circuit tags.
- g. Terminate and ground, control, instrument, and specialty cable shields as indicated and recommended by the manufacturer of the equipment being connected. In general, ground the shields at the control panels.
- h. Intermediate cable splices shall not be allowed when installing power, control, and instrument wiring except when splicing to lead wires provided

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES: continued

with the equipment or device, or unless approved by the Engineer prior to cable installation.

- i. Control and instrument and thermocouple cable splices shall be as follows:
  - (1) Made only in junction or terminal boxes.
  - (2) Made on terminal blocks with marking strips.
  - (3) Conductor color coding shall be maintained.
  - (4) For shielded cables, shield continuity and isolation shall be maintained.
  - (5) Thermocouple cable splices to be made only on terminal blocks which correspond to thermocouple type used.
- j. Power cable (600V or below) splices and motor terminations shall be as follows:
  - (1) Made only in junction or terminal boxes.
  - (2) Splices shall be made using compression type connectors bolted together.
  - (3) Splice to be covered with a heat-shrinkable connector insulator.
3. Cable Connections and Terminations:
  - a. Make up clean and tight to assure a low-resistance joint.
  - b. Make only in terminal boxes, equipment or other accepted enclosures and not in conduit or cable tray.
  - c. Install all connectors with tooling manufactured by the connector manufacturer and as specified.
4. Fire Proofing (Arc-Proofing) of Cables in Manholes, Handholes, and Vaults:
  - a. Communication or control shall be fireproofed as indicated.
  - b. Cable shall be fireproofed in accordance with the manufacturer's instructions.

3.02 FIELD QUALITY CONTROL:

- A. Manufacturer's Field Services: Provide as specified in DIVISION 01.
- B. Field Testing: Specified in SECTION 26 08 00.

END OF SECTION 26 05 19

**Burns & McDonnell Engineering Company  
 Engineers – Architects – Consultants  
 Kansas City, Missouri**

**WIRE AND CABLE SPECIFICATION SHEET**

**CVN1**

**THHN/THWN**

**B&McD TYPE:**

**NEC TYPE:**

**600 VOLT – UNSHIELDED SINGLE CONDUCTOR CONTROL CABLE**

**GENERAL REQUIREMENTS:**

**CONDUCTOR:** Class B stranded annealed copper (NEMA WC70/ICEA S-95-658 Section 2).  
**INSULATION:** Polyvinyl chloride “PVC” (NEMA WC70/ICEA S-95-658 Section 3).  
**CONDUCTOR JACKET:** Nylon (NEMA WC70/ICEA S-95-658 Section 4).  
**IDENTIFICATION:** Surface printing on the cable shall show manufacturer’s name, insulation type (THHN), conductor size, conductor type, voltage rating, and Underwriters Laboratories label (UL).

**SPECIFIC REQUIREMENTS:**

**TEMPERATURE RATING** Cable shall be suitable for operation under the following maximum conductor temperatures:

90°C --- Continuous, dry locations  
 75°C --- Continuous, wet locations

<b>MATERIAL THICKNESS:</b>	Conductor Size	Insulation Thickness (Mils) (NEMA WC70 /	Jacket Thickness (Mils) (NEMA WC70 /
	<u>(AWG or MCM)</u>	<u>ICEA S-95-658 Table 3-5)</u>	<u>ICEA S-95-658 Table 3-5)</u>
	14 - 11	15	4
	10 - 9	20	4

**FACTORY TESTS:** All cable shall be tested in accordance with requirements of NEMA WC70/ICEA S-95-658 Section 6, UL83, and UL1581.

**CERTIFICATION:** Cables shall be certified to be in conformance with all applicable requirements of NEMA WC70/ICEA S-95-658, UL83, and UL1581.

<b>Burns &amp; McDonnell Engineering Company</b> <b>Engineers – Architects – Consultants</b> <b>Kansas City, Missouri</b>	<b>WIRE AND CABLE SPECIFICATION SHEET</b>	
	<b>IVV1</b>	<b>TC</b>
	<b>B&amp;McD TYPE:</b>	<b>NEC TYPE:</b>
<b>600 VOLT – SHIELDED INSTRUMENT CABLE</b> <b>(WITH SHIELDED TWISTED PAIRS/TRIADS)</b>		
<b><u>GENERAL REQUIREMENTS:</u></b>		
CONDUCTOR:	Class B stranded annealed copper (NEMA WC57/ICEA S-73-532 Section 2).	
INSULATION:	Polyvinyl chloride “PVC” (NEMA WC57/ICEA S-73-532 Section 3). Color coding shall use pigmented compounds as follows; one conductor coded red, the second conductor coded black, and if the cable is for a triad, the third conductor shall be coded white. Each pair or triad will be sequentially numbered by surface printing.	
CONDUCTOR JACKET:	Nylon (NEMA WC57/ICEA S-73-532 Part 3)	
PAIR SHIELD:	Aluminized mylar or polyester tape with tinned copper drain wire.	
SHIELD ISOLATION TAPE:	Mylar or polyester tape.	
CABLE SHIELD:	Aluminized mylar or polyester tape with tinned copper drain wire.	
CABLE JACKET:	Polyvinyl chloride “PVC” (NEMA WC57/ICEA S-73-532 Section 4.2).	
IDENTIFICATION:	Surface printing on the cable jacket shall show manufacturer’s name, cable type (TC), insulation type, conductor type, conductor size, voltage rating, and Underwriters Laboratories label (UL).	
<b><u>SPECIFIC REQUIREMENTS:</u></b>		
TEMPERATURE RATING	Cable shall be suitable for operation under the following maximum conductor temperatures: <div style="margin-left: 40px;">90°C --- Continuous dry locations</div> <div style="margin-left: 40px;">75°C --- Continuous wet locations</div>	
CONDUCTOR SIZE:	#16 AWG	
INSULATION THICKNESS:	All conductors to have 15 mils of PVC and 4 mils nylon insulation. (NEMA WC57/ICEA S-73-532, Table 3-1).	
JACKET THICKNESS:	Calculated Diameter Of Cable Under <u>Jacket (Inches)</u>	Thickness (Mils) (NEMA WC57 / <u>ICEA S-73-532 Table 4-1)</u>
	0.425 or less	45
	0.426 - 0.700	60
	0.701 - 1.500	80
	1.501 - 2.500	110
	2.501 or larger	140
FACTORY TESTS:	All cable shall be tested in accordance with requirements of NEMA WC57/ICEA S-73-532 Section 6, ICEA 210,000 BTU flame test (ICEA T-29-520), and UL1277.	
CERTIFICATION:	Cables shall be certified to be in conformance with all applicable requirements of NEMA WC57/ICEA S-73-532, ICEA T-29-520, and UL1277.	

**WIRE AND CABLE SPECIFICATION SHEET**

**Burns & McDonnell Engineering Company**  
**Engineers - Architects - Consultants**  
**Kansas City, Missouri**

**SVN3****B&McD TYPE:****THHN/THWN****NEC TYPE:****600 VOLT - SINGLE CONDUCTOR - POWER CABLE****GENERAL REQUIREMENTS:**

**CONDUCTOR:** Class B stranded annealed copper (NEMA WC70/ICEA S-95-658 Section 2).  
**INSULATION:** Polyvinyl chloride "PVC" (NEMA WC70/ICEA S-95-658 Section 3).  
**CONDUCTOR JACKET:** Nylon (NEMA WC70/ICEA S-95-658 Section 4)  
**IDENTIFICATION:** Surface printing on the cable shall show manufacturer's name, insulation type (THHN), conductor size, conductor type, voltage rating, and Underwriters Laboratories label (UL).

**SPECIFIC REQUIREMENTS:**

**TEMP. RATING:** Cable shall be suitable for operation under the following maximum conductor temperatures:  
90°C --- Continuous, dry locations  
75°C --- Continuous, wet locations

**INSULATION THICKNESS:**

Conductor Size (AWG or MCM)	Insulation	Jacket
	Thickness (Mils) (NEMA WC70/ICEA S-95- 658 Table 3-5)	Thickness (Mils) (NEMA WC70/ICEA S-95- 658 Table 3-5)
14-11	15	4
10, 9	20	4
8-5	30	5
4-2	40	6
1-4/0	50	7
250-500	60	8
550-1000	70	9

**FACTORY TESTS:** All cable shall be tested in accordance with requirements of NEMA WC70/ICEA S-95-658 Section 6, UL83, and UL1581.

**CERTIFICATION:** Cables shall be certified to be in conformance with all applicable requirements of NEMA WC70/ICEA S-95-658, UL83, and UL1581.

## SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

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

#### 1.02 SUMMARY:

- A. This Section specifies electrical grounding and bonding as indicated on Drawings and schedules and as specified herein. Grounding and bonding Work is defined to encompass systems, circuits, and equipment.
- B. Type of electrical grounding and bonding Work specified in this Section includes the following:
  - 1. Solidly grounded. Grounded through a ground connection in which no impedance has been intentionally inserted.
- C. Applications of electrical grounding and bonding Work in this Section include the following:
  - 1. Underground metal water piping.
  - 2. Grounding electrodes.
  - 3. Counterpoise grounding loops.
  - 4. Raceways.
  - 5. Boxes and enclosures.
  - 6. Equipment.
- D. Refer to other Division 26 Sections for wires/cables, electrical raceways, boxes and fittings, and wiring devices which are required in conjunction with electrical grounding and bonding Work; not Work of this Section.

#### 1.03 RELATED REQUIREMENTS:

- A. Section 26 05 33 - Raceways, Boxes, and Supports for Electrical Systems.
- B. Section 26 05 53 – Electrical Identification.
- A. Division 31 for excavation for electrical installations within the building boundaries and from building to utility connections.

#### 1.04 REFERENCE STANDARDS:

- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- B. American Society for Testing and Materials (ASTM):
  - 1. B3 - Soft or Annealed Copper Wire.
  - 2. B8 - Concentric Lay Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
  - 3. B33 - Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes.
- C. Institute of Electrical and Electronic Engineers (IEEE): Comply with applicable requirements and recommended installation practices of the following IEEE Standards pertaining to grounding and bonding of systems, circuits, and equipment:
  - 1. 80 - Guide for Safety in Substation Grounding.

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

2. 81 - Guide for Measuring Ground Resistance, and Potential Gradient in the Earth.
  3. 141 - Recommended Practice for Electric Power Distribution for Industrial Plants.
  4. 142 - Recommended Practice for Grounding Industrial and Commercial Power Systems.
- D. National Electrical Contractors Association (NECA) Installation Standards.
- E. National Fire Protection Association (NFPA):
1. 70 - National Electrical Code (NEC): Comply with applicable local electrical code requirements of the authority having jurisdiction, and NEC as applicable to electrical grounding and bonding, pertaining to systems, circuits, and equipment.
- F. Underwriters Laboratories (UL): Comply with applicable requirements of the following standards. Provide grounding and bonding products which are UL-listed and labeled for their intended usage.
1. 467 - Electrical Grounding and Bonding Equipment.
  2. 486A - Wire Connectors and Soldering Lugs for Use with Copper Conductors.
  3. 869 - Electrical Service Equipment.
- 1.05 SUBMITTALS:
- A. Refer to Division 01 and Section 26 00 00 - General Electrical Requirements for administrative and procedural requirements for Submittals.
- B. Includes, but not limited to, the following:
1. Product Data: Submit manufacturer's data on all grounding and bonding components and associated accessories.
  2. Qualification Data: For Qualified Testing Agency and testing agency's field Supervisor.
  3. All field test reports.
- 1.06 QUALITY ASSURANCE:
- A. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS:
- A. Subject to compliance with requirements, provide grounding and bonding products of one of the following (for each type of product):
1. Grounding Products:
    - a. Burndy LLC.
    - b. Cadweld, Erico International Corp.
    - c. Erico-International Corporation.
    - d. Copperweld Bimetallics, LLC.
    - e. Ideal Industries, Inc.
    - f. Thomas & Betts, ABB Group.
    - g. Engineer-approved equal.
- 2.02 GROUNDING AND BONDING:
- A. Materials and Components:

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

1. General: Except as otherwise indicated, provide electrical grounding and bonding systems indicated; with assembly of materials, including, but not limited to, cables/wires, connectors, solderless lug terminals, grounding electrodes, bonding jumper braid, surge arresters, and additional accessories needed for a complete installation. Where more than one type component product meets indicated requirements, selection is Contractor's code-compliance option. Where materials or components are not indicated, provide products which comply with NEC, UL, and IEEE requirements and with established industry standards for those applications.
2. Conductors:
  - a. Unless otherwise indicated, provide insulated electrical grounding conductors for equipment grounding conductor connections that match power supply wiring materials and as a minimum are sized according to the NEC.
  - b. Provide annealed, tin-coated bare copper cable for buried ground system conductors, type BC2
  - c. Provide annealed, tin-coated bare copper cable for exposed ground system conductors, type BC2
  - d. Bare copper ground conductors shall meet ASTM B33 and B8.
3. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600V. Lexan or PVC, impulse tested at 5,000V.
4. 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.
  - a. Bolted Connectors for Conductors and Pipes: Copper or copper-alloy, pressure type with at least two silicon bronze or stainless-steel bolts and lock washers.
  - b. Bolted Service Connectors for Structural Steel: Shall have high-conductivity bronze alloy bolts and corrosion-resistant copper alloy nuts.
  - c. Irreversible Compression Fittings: Pure wrought copper extrusion clamps and connectors, made to be held in the dies of an installation tool. Connectors must be factory filled with an oxide inhibitor.
  - d. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
  - e. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals and long-barrel, two-bolt connection to ground bus bar.
5. Ground Rods or Ground Electrodes:
  - a. Ground Rods or Grounding Electrodes: Copper-clad steel or copper-alloy, sectional type rods. One end pointed to facilitate driving, 3/4-inch diameter by 10 feet.

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

6. Electrical Grounding Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing, welding materials, bonding straps, as recommended by accessories manufacturers for type service required or indicated.
7. Mastic Coatings:
  - a. Sonneborn-Sonoshield Mastics (BASF Construction Chemicals LLC).
  - b. W.R. Meadows - Sealmastic.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install electrical grounding and bonding systems as indicated, in accordance with manufacturer's instructions and applicable portions of NEC, NECA's "Standards of Installation," and in accordance with recognized industry practices to ensure that products comply with requirements.
- B. A grounding electrode shall be installed at each building or structure as indicated.
  1. Grounding electrodes shall consist of the following:
    - a. Ground rod and cable system.
    - b. Concrete-encased electrode.
    - c. Grounded metal frame of the building or structure.
    - d. Metal underground water pipe.
    - e. Other systems or structures as indicated.
- C. Ground Rods:
  1. Install rods as indicated by driving and not by drilling or jetting.
  2. Drive rods into unexcavated portion of the earth where possible.
  3. Where rods must be installed in excavated areas, drive rods into earth after compaction of backfill is completed.
  4. Drive to a depth such that top of rods will be approximately 18 inches below final grade or subgrade, and connect main grid ground cable thereto.
  5. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
  6. Separation between ground rods shall be equal to or greater than the length of the rods.
  7. The ground electrode conductor shall not contain splices between the ground electrode and the service entrance equipment.
- D. Counterpoise Ring: Install a grounding conductor extending around the perimeter of the valve chamber.
  1. Install a ground conductor for the ground ring and for taps to building steel.
  2. Bury ground ring not less than 24 inches from building's foundation.
- E. Grounding Conductors:
  1. Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.
  2. Install using as few joints as possible. Route along shortest and straightest paths possible unless otherwise indicated or required by Code.

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

3. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage. Suitably protect cable against damage during construction.
4. Replace or suitably repair cable if damaged by anyone before final acceptance.
5. In Exposed Installations:
  - a. Route runs as indicated.
  - b. Route along the webs of columns and beams, and in corners where possible for maximum physical protection.
  - c. Where physical protection is required, install in PVC conduit unless indicated otherwise.
  - d. Support at intervals of 3 feet or less with nonmagnetic clamp-type supports.
6. In Buried Installations:
  - a. Conductor sizes shall be as indicated for specific connections. For required connections not indicated, use conductor size not less than No. 4/0 AWG if buried in the earth or cast in concrete, or No. 6 AWG at other locations.
  - b. Lay in bottom of trench or in other excavations at the depth of the top of the ground rod.
  - c. Bury at least 30 inches (600 mm) below grade.
  - d. Maintain clearance of at least 12 inches from all underground metal piping or structures, except where connections thereto are specifically indicated.
  - e. Ground cable shall enter the bottom of electrical gear or panels sitting on a slab through a PVC sleeve.
7. Backfill as specified in Division 31.
8. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank or in duct bank as indicated.
- F. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- G. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
  1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors or irreversible compression fittings for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- H. Conductor Terminations and Connections:
  1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors with silicon bronze or stainless-steel bolts and lock washers.
  2. Underground Connections: Provide exothermic welded connections where grounding conductors connect to underground grounding conductors and underground grounding electrodes.
  3. Connections to Structural Steel:
    - a. Exothermically welded connectors where allowed by the structural steel.

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

- b. Bolted fittings where structural steel cannot be welded, but can be field drilled.
  4. Clean metal contact surfaces of clamp-on connectors to ensure electrical conductivity and circuit integrity.
  5. Exothermic terminations:
    - a. Conform to manufacturer's instructions.
    - b. Chemically degrease and dry completely before welding.
    - c. Apply one coat of mastic coating to all exothermic-welded connections to be buried.
- I. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70; use a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4/0 AWG for a grounding conductor.
  1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
  2. Bond grounding conductor to reinforcing steel mat in at least four locations using compression fittings designed for the intended purpose.
  3. The grounding connection to the supplemental electrode shall be bonded by either exothermic welding or irreversible compression fittings.
  4. Extend a bonding conductor from concrete-encased electrode, below grade and out to building's grounding grid and bond.
  5. Extend a bonding conductor from at least one concrete-encased electrode out of the concrete and bond to the grounding electrode.
  6. Welding Ufer ground to the ground counterpoise system.
    - a. A pig-tail of copper from the concrete-encased electrode shall penetrate the foundation and be exothermically welded to the ground counterpoise system.
- J. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
  2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.
  3. Insulate and support grounding bus at intervals not to exceed 2 feet on centers or as indicated.
- K. Grounding and Bonding of Metal Underground Water Pipe:
  1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes. Use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
- L. All grounding system components shall be bonded to form one continuous grounding electrode.

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

- M. Ground electrical service system neutral at service entrance equipment to grounding electrodes.
- N. Ground each separately derived system neutral to the main building ground system:
- O. Bond the system neutral to service entrance equipment enclosures.
- P. Ground all exposed noncurrent carrying metal parts of electrical equipment, metal raceway systems, grounding conductors in raceways and cables, receptacle ground conductors, and metallic plumbing systems.
- Q. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with tightening torque values specified in UL 486A to assure permanent and effective grounding.
- R. Apply mastic coating to field connections, buried metallic grounding and bonding products, and places where factory applied protective coatings have been destroyed, which are subjected to corrosive action.

3.02 INSTALLATION - EQUIPMENT GROUNDING:

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Terminate feeder and branch circuit insulated equipment grounding conductors with grounding lug on substation, switchgear, switchboard, motor control center, or panelboard ground bus. When conduit enters from below and is not connected to the enclosure, ground equipment grounding conductor on conduit grounding bushing and then bond to ground bus (or grounded enclosure if there is no ground bus).
- C. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.
  - 5. Three-phase motors.
  - 6. Flexible raceway and power cords runs.
- D. Bond all motors and equipment 100 Hp or larger to the grounding electrode system with a minimum No. 2 AWG bare copper wire.
- E. Bond all motors with “identified” ground conductor. Route in conduit with phase conductors.
- F. Enclosure Grounds: Bond all enclosures by direct copper connection to the grounding electrode system.
- G. Building Grounding Conductors: Support at intervals not to exceed 3 feet on center or as indicated.

3.03 LABELING:

- A. Comply with requirements in Section 26 05 53 – Electrical Identification for instruction signs. The label or its text shall be green.

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: continued

3.04 INSPECTION:

- A. Do not cover up connections before they are inspected by Engineer.
- B. Compression-type connections shall be inspected for embossment of proper die index per manufacturer's instructions.

3.05 FIELD QUALITY CONTROL:

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Tests and Inspections:
  - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  - 3. All compression-type connections shall be inspected for proper die index number.
  - 4. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal and at individual ground rods. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81 for the following:
      - (1) Testing and commissioning of new grounds, not yet connected to the utility power supply.
      - (2) Testing complex ground systems that include a metallic loop.
  - 5. Prepare dimensioned Drawings locating each ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
  - 1. Each ground rod: 25 ohms.
  - 2. Completed grounding system: 1 ohm or less.
  - 3. Power Distribution System/Substation: 1 ohm or less.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

**Burns & McDonnell Engineering Company  
Engineers – Architects – Consultants  
Kansas City, Missouri**

**WIRE AND CABLE SPECIFICATION SHEET**

**BC1**

**B&McD TYPE:**

**NEC TYPE:**

**BARE COPPER GROUND CABLE**

**GENERAL REQUIREMENTS:**

Annealed, uncoated, bare copper (ASTM B3)

**SPECIFIC REQUIREMENTS:**

1. Solid in sizes 4 AWG and smaller.
2. Class B stranded in sizes 2 AWG and larger (ASTM B8)

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 SUMMARY:

- A. This Section specifies the following:
  - 1. Conduit.
  - 2. Wireway.
  - 3. Outlet and device boxes.
  - 4. Pull and junction boxes.
  - 5. Fittings.
  - 6. Bushings and ground bushings.
  - 7. Locknuts.
  - 8. Knockout closures.
  - 9. Firestopping and duct seal.
  - 10. Hangers, supports, anchors and accessories.
  - 11. Grout.
  - 12. Silicone sealants.
- B. For the purposes of this SECTION only the following areas shall be considered “Dry Indoors” all other areas shall be considered “Outdoor and Wet/Damp Indoor.”
  - 1. Pump Station Interior.
  - 2. Valve Room.
  - 3. Interior of Tank Pedestal.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

- A. Division 31 for excavation for electrical installations within the building boundaries and from building to utility connections.
- B. Section 26 00 00 - General Electrical Requirements.
- C. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- D. Section 26 05 53 - Electrical Identification.

1.04 REFERENCES:

- A. American National Standards Institute (ANSI):
  - 1. A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
  - 2. C80.1 - Rigid Steel Conduit, Zinc-Coated.
  - 3. C80.5 - Rigid Aluminum Conduit.
  - 4. E814 - Test Method for Fire Tests of Penetration Firestop Systems.
- B. American Welding Society (AWS):
  - 1. AWS D1.1/D1.1M - "Structural Welding Code - Steel."

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

- C. ASTM International:
  - 1. B241 - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
- D. National Fire Protection Association (NFPA):
  - 1. 70 - National Electrical Code (NEC).
- E. National Electrical Contractor's Association (NECA):
  - 1. NECA-1 - "Standard Practice of Good Workmanship in Electrical Construction."
- F. National Electrical Manufacturers Association (NEMA):
  - 1. RN1 - Active Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
  - 2. TC2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
  - 3. TC3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
  - 4. TC6 and 8 - Polyvinyl Chloride (PVC) Plastic Utilities for Underground Installation.
  - 5. OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports.
  - 6. 250 - Enclosures for Electrical Equipment (1,000V Maximum).
- G. Society of Protective Coatings (SSPC):
  - 1. SSPC-PA 1 - Shop, Field and Maintenance Painting of Steel.
  - 2. SSPC-SP3 - Power Tool Cleaning.
- H. Underwriters' Laboratories, Inc. (UL):
  - 1. Provide all devices, components, and equipment that are UL listed and labeled.
  - 2. 5, 5C - Standard for Surface Metal Raceways and Fittings.
  - 3. 6 - Electrical Rigid Metal Conduit - Steel.
  - 4. 6A - Electrical Rigid Metal Conduit - Aluminum, Bronze, and Stainless Steel.
  - 5. 50 - Standard for Enclosures for Electrical Equipment.
  - 6. 50E - Standard for Electrical Equipment Environmental Considerations.
  - 7. 360 - Liquid-Tight Flexible Steel Conduit.
  - 8. 514A - Metallic Outlet Boxes.
  - 9. 514B - Fittings for Cable and Conduit.
  - 10. 651 - Schedule 40 and 80 Rigid PVC Conduit.
  - 11. 651A - Schedule 40 and 80 High Density Polyethylene (HDPE) Conduit.
  - 12. 870 - Standard for Wireways, Auxiliary Gutters, and Associated Fittings.

1.05 SUBMITTALS:

- A. Submit as specified in DIVISION 01 and Section 26 00 10 - General Electrical Requirements for administrative and procedural requirements for submittals.
- B. Submittals shall include, but not be limited to, the following:
  - 1. Product Data:
    - a. Submit manufacturer's technical product data, including specifications and installation instructions, for each type of product required. Include data substantiating that materials comply with requirements.
    - b. Submit manufacturer's data on supporting devices including catalog cuts, specifications, and installation instructions, for each type of support, anchor, sleeve, and seal.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

1.06 QUALITY ASSURANCE:

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.
- C. Installations shall follow standard practices of NECA-1.

1.07 COORDINATION:

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete specifications.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Rigid Aluminum Conduit:
  - 1. Allied Tube and Conduit; a Tyco Company.
  - 2. Indalex, Inc.
  - 3. New Jersey Aluminum Company.
  - 4. Phelps Dodge Cable and Wire Company.
  - 5. Republic Conduit; division of Maverick Tube Corporation.
  - 6. Thomas & Betts Corporation.
  - 7. Wheatland Tube Company.
  - 8. V.A.W. of America Inc.
- B. Rigid Aluminum Conduit Fittings:
  - 1. Appleton Electric Company.
  - 2. Cooper Crouse-Hinds Company.
  - 3. Killark; division of Hubbell, Inc.
  - 4. Thomas & Betts Corporation.
- C. Rigid Steel Conduit and Fittings with Bonded Polyvinyl Chloride (PVC) Jacket:
  - 1. OCAL Inc.
  - 2. Robroy Industries.
    - a. Korkap
    - b. Perma-Cote
    - c. Plasto-Bond
- D. Rigid Polyvinyl Chloride (PVC) Conduit and Fittings:
  - 1. IPEX Inc.
  - 2. Certain-Teed Products Corporation.
  - 3. Carlon Lamson and Sessions.
  - 4. Cantex Inc.
- E. Liquid-Tight Flexible Metal Conduit:
  - 1. Anamet Electrical, Inc.
  - 2. Electri-Flex Company.
  - 3. Carol Company (div. of Allied Wire and Cable).

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

4. Flexi-Guard Incorporated, O.Z./Gedney Company.
5. Thomas & Betts Corporation.
- F. Outlet and Device Boxes:
  1. Appleton Electric Company.
  2. Cooper Crouse-Hinds Company.
  3. Hubbell-Killark.
  4. Leviton.
  5. O-Z Gedney.
  6. Thomas & Betts Corporation.
- G. Pull and Junction Boxes:
  1. Metallic Indoor and Outdoor Boxes:
    - a. Cooper B-Line.
    - b. Hoffman Engineering Company.
    - c. Hubbell Wiegmann.
  2. Fiberglass Boxes:
    - a. Cooper Crouse-Hinds Company, Krydon type.
    - b. Square D Company; Krydon type.
    - c. Hoffman Engineering Company of Anoka, Minnesota.
- H. Conduit Hubs and Bodies:
  1. Appleton Electric Company.
  2. Myers Industries, Inc. (ITT).
  3. Cooper Crouse-Hinds Company.
  4. O.Z. Gedney Company.
  5. Thomas & Betts Corporation.
- I. Fittings:
  1. Cooper Crouse-Hinds Company.
  2. Appleton Electric Company.
  3. Thomas & Betts Corporation.
- J. Bushings, Grounding Bushings, and Locknuts:
  1. Arrow Hart; Eaton.
  2. Appleton; EGS Electrical Group.
  3. O-Z/Gedney; EGS Electrical Group.
  4. Raco; Hubbell, Inc.
  5. Steel City; Thomas & Betts Corp.
- K. Electrical Enclosures:
  1. Hoffman; nVent.
  2. Wiegmann; Hubbell, Inc.
  3. Saginaw.
- L. Anchor Manufacturers: Subject to compliance with requirements, provide anchors of one of the following manufacturers.
  1. B-line, Eaton.
  2. Hilti, Inc.
  3. Powers, DeWalt.
  4. Red Head, ITW.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

5. Unistrut, Atkore International.
  - M. Metal Channel System Manufacturers: Subject to compliance with requirements, provide channel system of one of the following manufacturers.
    1. Allied Tube & Conduit Corp.; Power Strut Division.
    2. Eaton/Cooper; B-Line Systems, Industries.
    3. Erico International Corp.
    4. Kindorf; Thomas & Betts Corp.
    5. Power-Strut; Power Engineering Co.
    6. Superstrut; Thomas & Betts Corporation.
    7. Unistrut; Atkore International.
  - N. Firestopping:
    1. The 3M Company.
    2. Engineer-approved equal.
  - O. Duct Seal:
    1. Ideal Industries, Inc.
    2. The 3M Company.
    3. Engineer-approved equal.
- 2.02 DESIGN REQUIREMENTS:
- A. Conduit:
    1. Each length of threaded conduit furnished with coupling on one end and metal or plastic thread protector on other end.
    2. UL listed and labeled conduit, on each length, fittings, and accessories.
    3. Sizes of conduit, fittings, and accessories as indicated, specified, or as required by Electrical Codes and Standards.
  - B. Supports:
    1. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
    2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- 2.03 RIGID ALUMINUM CONDUIT:
- A. Raceway:
    1. Fabricated from ASTM B241 alloy GS 10A, identical to Aluminum Association Alloy 6063. Shall meet UL 6A.
    2. All scale, dirt, grease, burrs, and other foreign matter removed prior to applying coating.
    3. Entire length coated with a special silicone lubricating compound compatible with wire and cable coverings to minimize wire drag.
    4. Each length threaded at both ends.
    5. Threads protected with a homogenized zinc dust petroleum lubricating compound to prevent seizure.
    6. Coupling and elbows fabricated from the same material as conduit and each treated as required for conduit.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

7. Couplings may use alloy 3003 in lieu of 6063.
- B. Fittings:
  1. Heavy-duty cast, copper-free aluminum (less than 0.4%).
  2. Full threaded hubs.
  3. Rubber-gasketed covers of pressed or cast aluminum.
  4. Cadmium-plated or bronze hardware bolts and screws.
  5. LBD or roller action type LB for right-angle fittings for conduit sizes 2 inches and larger.
  6. Standard and junction fittings.
  7. Form 8 bodies and covers.

2.04 RIGID STEEL CONDUIT AND FITTINGS WITH BONDED POLYVINYL CHLORIDE (PVC) JACKET:

- A. Raceway:
  1. Conform to hot-dipped galvanized rigid steel conduit as specified in RIGID STEEL CONDUIT, this Section, and as follows. Shall comply with NEMA RN1.
  2. PVC coating bonded to the conduit. Extruded PVC jackets are unacceptable.
  3. Coated externally with PVC to a nominal 40 mils, 0.035 inch to 0.045 inch.
  4. Uniformly coated around outside diameter and full length of the conduit.
  5. Pre-threaded ends coated with a urethane coating having a nominal thickness of 2 mils (0.002 inch).
  6. Interior surfaces of all conduits and feed-through fittings coated (except where prohibited by design) with a two-part, chemically cured, urethane coating having a nominal thickness of 2 mils (0.002 inch).
  7. The bond between the metal and jacket must exceed the tensile strength of the coating.
- B. Couplings, Elbows, and Fittings:
  1. Couplings, elbows, and other conduit fittings, boxes, cover plates, supports, hardware, and related items shall be treated and coated with the same process as conduit.
  2. Each coupling and fitting to include a PVC sleeve that overlaps the conduit.
  3. Length of the overlapping sleeve equals diameter of the conduit or 2 inches, whichever is least.
  4. Final cured PVC coating capable of withstanding a minimum electrical potential of 2,000V.
  5. All conduit accessories, clamps, and hardware that are uncoated shall be stainless steel.
  6. All fittings intended for wet, outdoor, or wash-down application shall carry a NEMA 4X rating.
  7. Form 8 bodies and covers.

2.05 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT:

- A. Fabricated from self-extinguishing high-impact polyvinyl chloride designed for aboveground and underground installations.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

- B. Shall meet NEMA TC2, TC6 and TC8, and UL 651.
- C. Type EPC Schedule 40 heavy-wall rigid conduit.
- D. Fittings and accessories fabricated from same material as conduit. Shall meet NEMA TC3.
- E. Solvent-cement-type joints as recommended by manufacturer.

2.06 RIGID GALVANIZED STEEL CONDUIT:

- A. Raceway:
  - 1. Conform to ANSI C80.1, and UL 6.
  - 2. Mild ductile steel, circular in cross section with uniform wall thickness sufficiently accurate to cut clean threads.
  - 3. Each length threaded on both ends with threads protected.
  - 4. All scale, grease, dirt, burrs, and other foreign matter removed from inside and outside prior to application of coating materials.
  - 5. Galvanized by the hot-dip process as follows:
    - a. Interior and exterior surfaces coated with a solid, unbroken layer of 99% virgin zinc by dipping.
    - b. Coating not to show fixed deposits of copper after four 1-minute immersions in a standard copper sulfate solution.
    - c. One coat of zinc-chromate finish on inside and outside surfaces to prevent oxidation and white rust.
  - 6. Couplings and elbows fabricated, coated and finished by the same process as conduit.
- B. Fittings:
  - 1. Heavy-Duty Cast Malleable Iron Fittings:
    - a. Mogul type for conduit sizes 1-1/2 inches and larger.
    - b. LBD or roller action type LB for right-angle fittings for conduit sizes 2 inches and larger.
    - c. Full-threaded hubs and rubber-gasketed covers.
    - d. Zinc, cadmium-plated, or bronze hardware bolts and screws for assembly.
    - e. Finished with cadmium plating or galvanizing.
    - f. Form 8 bodies and covers.
    - g. Standard and junction fittings.
  - 2. Conduit Expansion Fittings:
    - a. Line of Conduit Type:
      - (1) Galvanized expansion fittings for rigid conduit movement up to 4 inches.
      - (2) Insulated metal bushing on ends of the conduit, bonding jumper, and with expansion head sealed with a high-grade graphite packing.
      - (3) O-Z/Gedney, Type AX with Type AJ bonding jumper or Thomas & Betts, Type XJG.
    - b. End Type:
      - (1) For conduit terminating in a junction box.
      - (2) O-Z/Gedney, Type EXE with Type BJ-E bonding jumper.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

3. Conduit Expansion and Deflection Fittings:
  - a. Provide for movement of 3/4 inch from normal in all directions between two rigid conduits.
  - b. Integral bonding jumper.
  - c. O-Z/Gedney, Type DX.

2.07 LIQUID-TIGHT FLEXIBLE METAL CONDUIT:

- A. Liquid-tight conduit with flexible galvanized-steel core and a synthetic rubber, polyvinyl chloride, or thermoplastic covering.
- B. Shall comply with UL 360.
- C. Spiral encased copper bonding conductors for conduit in sizes 1-1/4 inches and smaller.
- D. External grounding jumper as required.
- E. Provide hot-dipped galvanized fittings for connections to rigid steel conduit, and aluminum- or PVC-coated fittings for connections to PVC-coated rigid steel conduit.
- F. Fittings for flexible metal conduit shall comply with UL 514B.

2.08 OUTLET AND DEVICE BOXES:

- A. Surface Mounted:
  1. Cast hub device boxes for receptacles and switches.
  2. Cast aluminum. Metallic boxes shall meet UL 514A and NEMA OS 1.
  3. PVC boxes for PVC conduit. PVC boxes shall meet UL 514C and NEMA OS 2.
  4. FS or FD single or multiple gang boxes as required.
- B. Flush Mounted in Plaster Walls:
  1. Galvanized, flat-rolled, sheet-steel non-gangable device boxes.
  2. Conduit knockout openings in bottom and sides.
  3. Threaded screw holes for fastening devices and box covers.
  4. Corrosion-resistant screws for equipment grounding.
  5. Include mounting brackets, device extensions plaster ears, and plaster board expandable grip fasteners (for existing plaster walls) compatible with box.
  6. Shall meet UL 514A and NEMA OS 1.

2.09 PULL AND JUNCTION BOXES:

- A. Steel Boxes – Dry Indoors:
  1. Hot-dipped galvanized steel.
  2. Galvanized-steel covers.
  3. Conform to NEMA Type 1.
  4. Cadmium-plated or bronze screws and bolts.
  5. For special boxes where it is not possible to provide hot-dip galvanizing, apply organic zinc-rich primer at 3-mils dry film thickness after SSPC-SP3 Power Tool Cleaning.
  6. Minimum of 14-gage steel.
  7. Conform to NEMA Type 1 enclosure in all nonhazardous areas except as specified or indicated otherwise.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

- a. Junction boxes may be standard type with knock outs except as indicated otherwise.
8. Include piano-hinged, gasketed cover and interior mounting panel where oil-tight J.I.C boxes are used for enclosing terminal blocks and control relays.
9. Waterproof hubs in areas subject to moisture, such as the valve chambers and outdoors.
- B. Steel Boxes – Outdoor and Wet/Damp Indoor:
  1. Type 304 or 316 stainless steel with stainless-steel cover and stainless-steel clamps and screws.
  2. Minimum 16 gage for boxes with no dimension exceeding 6 inches and minimum 14 gage for all other boxes.
  3. Continuously welded seams shall be ground for a smooth finish.
  4. Seamless gasket for cover.
  5. Conform to NEMA Type 4X.
  6. Provide continuous hinge, gasketed cover, and interior mounting plate when used for enclosing terminal blocks and control relays.
  7. Provide rigid weatherproof conduit hubs for all boxes.
- C. Rigid Aluminum Conduit Boxes: (Allowed with aluminum conduit only)
  1. For use in indoor and outdoor locations.
  2. Self-oxidizing, self-renewing aluminum alloy that is "copper-free" - less than 0.3 of 1% to assure resistance to corrosion, with a minimum wall thickness of 3/32 inch.
  3. Threaded conduit entrance with thread lubricant.
  4. Thoroughly cleaned to eliminate grease and other contaminates.
  5. Rubber or neoprene gasket for cover.
  6. Conform to NEMA Type 4 enclosures in all outdoor installations unless indicated otherwise.
  7. Interior mounting panel when used for enclosing terminal blocks and control relays.
  8. Box size as required by NEC or as indicated for each particular installation.
  9. Include provisions for mounting cable supports as indicated, specified or as required by NEC.
  10. Provide where indicated for cable pulling, junctions, terminals and for mounting of switches, outlets, and control devices.
- D. Metallic Barriers:
  1. Designed not to separate phases of a power circuit.
  2. Provide as indicated for the isolation of power circuits from other type circuits
- E. Bushings: Provide threaded, nylon-insulated metallic bushings. Provide steel bushings for conduit sizes 1-1/2 inches and smaller. Provide malleable iron bushings for conduit sizes 2 inches and larger.
- F. Grounding Bushings: Provided where indicated, specified and required by NEC. Provide threaded, insulated, malleable iron bushing with lay-in screw clamp lug.
- G. Locknuts: Provide steel locknuts for conduit sizes 2 inches and smaller. Provide malleable iron for conduit sizes 2.5 inches and larger.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

- H. Sealing Hub: Provide watertight, threaded, insulated sealing hub connectors for all outdoor and indoor wet locations where conduit enters into enclosures. Sealing hub threaded lengths shall be adequate to allow installation of bushing.
- I. Knockout Closures: Provide steel press-in knockout seals for all unused punched out knockouts 2 inches and smaller. Provide steel two-piece bolt on knockout seals for all unused punched out knockouts 2-1/2 inches and larger.
- J. Fittings: Provide all threaded nipples, insulated short elbows, offset nipples, offset connectors, enlargers and reducers as required
- K. Hinged-Cover Enclosures:
  - 1. Comply with UL 50 and NEMA 250, Type 12 for indoor and Type 4X for outdoor and damp areas.
  - 2. Provide with continuous-hinge cover with flush latch unless otherwise indicated.
  - 3. Nonmetallic Enclosures: Fiberglass.
  - 4. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
  - 5. Metal barriers to separate wiring of different systems and voltage.
  - 6. Gasketed enclosures shall meet UL 50E.

2.10 CONDUIT WALL ENTRANCE SEALS:

- A. Provide where required or indicated.
- B. Use O.Z./Gedney Company Type FSK for new walls.
- C. Use O.Z./Gedney Company Type CSM for penetration in existing walls.

2.11 STEEL SUPPORT SYSTEM:

- A. General: Provide supporting devices which comply with manufacturer's standard materials, design, and construction in accordance with published product information, as required for complete installation, and as herein specified. All supports shall be designed for the support of the maximum number of conduits and their maximum conductor weights for maximum conduit loading. Where more than one type of supporting device meets indicated requirements, selection is Contractor's option. Do not use perforated metal straps for supports.
- B. Fabricated from structural aluminum or manufactured framing members equal to "Unistrut" P-3000 (1-5/8 inch by 1-3/8 inch) series as manufactured by Unistrut Corporation, Kindorf B-995 (1-1/2 inch by 1-1/2 inch) series as manufactured by Thomas and Betts, or Superstrut A-1200 (1-5/8 inch by 1-5/8 inch) series as manufactured by Thomas and Betts.
- C. Minimum 12 gage.
- D. Construct as required to rigidly support all conduit runs, boxes, and equipment.
- E. Supports: (All Locations)
  - 1. Stainless-steel conduit clamps and hangers, sized for the specific conduit diameter.
  - 2. Provide stainless-steel rods, anchors, inserts, bolts, washers, nuts, and support hardware.
- F. Anchors: Anchors of types, sizes, and materials indicated, with the following construction features.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

1. Lead Expansion Anchors: 1/2, 5/8, or 3/4 inch as required.
2. Toggle Bolts: Springhead, 3/16 by 4 inch or larger size as required.

2.12 FIRESTOPPING AND DUCT SEAL:

- A. Firestopping:
  1. Weather-resistant silicone sealant.
  2. Provide 4-hour fire rating.
  3. Provide flexible re-enterable and repairable seal around conduit.
  4. ANSI E814 tested system.
  5. Provide 3M<sup>®</sup> Fire Barrier 2000+ Silicone Sealant or Engineer-approved equal.
- B. Duct Seal:
  1. Noncorrosive, permanently soft compound.
  2. Nontoxic.
  3. Provide flexible re-enterable and repairable seal around cables in conduits.
  4. Prevent air movement and drafts through conduits.
  5. Provide Ideal Industries Duct Seal, 3M<sup>®</sup> Moldable Putty, or Engineer-approved equal.

2.13 GROUT:

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5,000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.14 SILICONE SEALANTS:

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
  1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Provide suitable protection for conduit risers against damage during construction.
- B. Cap ends of all conduits before concrete is poured.
- C. Cap all conduits after cleaning where conduits are to be left empty by this Contract.
- D. Carefully ream ends of all conduit lengths after cutting to eliminate sharp burrs.
- E. Clean out all conduits before pulling wire.
- F. Clean out all conduits immediately after concrete work is finished.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

3.02 RACEWAYS AND BOX INSTALLATION:

A. General Requirements:

1. Location:
  - a. Install conduit as near as possible to the routing where indicated.
  - b. Shift locations as required to avoid interference with other equipment and piping being installed.
  - c. Where routing of conduit is not indicated, such as for lighting home run circuits and other systems requiring small conduit runs, route conduit as specified subject to approval by Engineer.
2. Do not use conduit in sizes smaller than 3/4 inch, except 1/2 inch may be used for connections to control devices.
3. All conduit installed indoors shall be field routed and surface mounted. No conduit shall be embedded in concrete without permission from Engineer.
4. Holes and Sleeves:
  - a. Provide through floors, walls, and roofs as necessary for conduit runs, including approved flashing and weather proofing at outside walls and on roofs.
  - b. Install sleeves or forms for all openings in new Work.
  - c. Provide the required inserts and holes, completely sleeved, bonded, curbed, flashed, and finished off in an approved manner, whether in concrete, steel grating, metal panels, or roofs.
  - d. Core-drill all holes required in existing building work using a dustless method.
  - e. Place non-shrinking grout or Dow Corning 3-6548 Silicone RTV or equivalent General Electric RTF 762 sealant as specified, in the following locations:
    - (1) All holes in concrete, walls, floor, and roof slabs after installation of conduit.
    - (2) All unused holes and sleeves as approved by Engineer.
  - f. Install wall entrance seals where conduit enters the building or vaults from exterior underground.
5. Install firestopping at all conduit penetration of fire-rated walls, ceilings, and floors. Firestopping system shall equal or exceed fire rating of wall, ceiling, or floor in which it is installed.
6. Install duct seal in conduits around cables at all conduit terminations at control panels and boxes containing terminations and splices when conduit originates from damp/wet areas for prevention of moisture and water entry.
7. Make connections to boxes, panels, and other equipment as follows:
  - a. Indoor Dry Locations: Double locknuts, one inside and one outside.
  - b. Outdoor and Damp Locations: Rigid weatherproof conduit hubs.
  - c. Bushings:
    - (1) Threaded malleable iron or steel.
    - (2) Insulated with Bakelite, molded and bonded into the bushing.
    - (3) Placed on end of conduit in addition to locknuts.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

- (4) Install with integral grounding connector and conductor where all conduits pass through multiple concentric panel knockouts and where the conduit must be bonded to equipment it is not attached to.
  8. Running threads will not be permitted.
  9. Coat all field cut threads in galvanized conduit with cold galvanizing paint.
  10. Comply with applicable requirements of NEC pertaining to installation of conduit systems.
  11. Place drainage fittings or weep holes at unavoidable low points where moisture can collect.
  12. Install an entire conduit system that is electrically continuous with bonding jumpers provided as necessary to conform to NEC.
  13. Install expansion fittings at all building expansion joints and every 100 feet of continuous conduit.
- B. Rigid Aluminum Conduit (RAL):
1. All exposed conduit installed indoors or outdoors shall be RAL.
  2. Do not install underground or cast in concrete.
  3. Use anti-seize compound on conduit threads.
  4. Use bender one size larger than nominal up through 1 inch and conventional size bender for conduit over 1 inch in size.
  5. Install same as rigid steel conduit as specified in INSTALLATION, this Section.
  6. For short runs, the use of flat steel tapes is prohibited. Polyethylene fish tapes and round, flexible, speedometer-type steel cables are recommended.
- C. Rigid Steel Conduit PVC Jacketed:
1. Install as direct buried where indicated.
  2. Coat field cut threads with manufacturer's standard product in accordance with manufacturer's recommendations.
  3. Use bender one size larger for conduit sized 1 inch or less and conventional bender for conduit sized above 1 inch.
  4. Use strap wrench to tighten conduit. Repair damaged coating with liquid patching compound recommended by conduit manufacturer.
  5. Buried:
    - a. All direct buried conduit shall be PVC jacketed Rigid Steel
    - b. Use for conduit risers where routed through concrete slabs or duct banks.
    - c. After trench bottom has been finished to grade, lay conduit. Backfilling shall be as specified in DIVISION 31.
    - d. Cap ends of all conduit risers before backfilling.
- D. Liquid-Tight Flexible Metal Conduit.
1. Use between rigid conduit and motor terminal boxes except where conduit runs down from above and cannot be conveniently supported by a floor flange.
  2. Place between rigid conduit or conduit box and control device cases where direct connection is not desirable for reasons of equipment movement, vibration, or for ease of maintenance.
  3. Install at all points of connection to equipment mounted on supports to allow for expansion and contraction.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

4. Conform to NEC with installation of conductors.
  5. Install at locations where rigid conduit connections are impractical.
  6. Use minimum length consistent with manufacturer's standard lengths, the acceptable bending radius, and with required movement of equipment.
  7. Maximum length of 3 feet unless otherwise approved by Engineer.
  8. Install an external bonding jumper to conform to NEC on conduit sized 1-1/2 inches and larger.
- E. Conduit Fittings:
1. Installations of special fittings are indicated.
  2. Use aluminum fittings for joining aluminum to steel conduit.
  3. Install as required.

3.03 BOXES AND FITTINGS:

- A. Install electrical boxes, bushings, locknuts, nipples, connectors, sealing hubs, and fittings as required, indicated, in accordance with applicable requirements of NEC and in accordance with recognized industry practices to fulfill Project requirements.
- B. Coordinate installation of electrical boxes and fittings with wire/cable, wiring devices, and raceway installation work.
- C. Provide weatherproof boxes for interior and exterior locations exposed to weather or moisture.
- D. All boxes containing emergency power and lighting circuits shall be identified as specified in Section 26 05 53 - Electrical Identification.
- E. Provide (oil-tight) knockout closures to cap unused knockout holes where blanks have been removed.
- F. Install electrical boxes in only those locations which ensure ready accessibility to enclosed electrical wiring.
- G. Do not install aluminum products in concrete.
- H. Position recessed outlet boxes accurately to allow for surface finish thickness.
- I. Fasten electrical boxes firmly and rigidly to the surfaces to which attached, structural surfaces to which attached, or solidly embed them in concrete or masonry.
- J. Properly ground metallic electrical boxes in compliance with the NEC. Bond all non-isolated equipment grounding conductors to all electrical boxes.
- K. Subsequent to installation of boxes, protect boxes from construction debris and damage.
- L. Install special boxes as indicated of size required for conduits and cables entering and leaving box.

3.04 SUPPORTS:

- A. Construct with sufficient rigidity to hold all mounted equipment and material in permanent and neat alignment.
- B. Design to provide 1/4-inch space between equipment housings and walls or columns upon which they are mounted.
- C. Do not exceed load requirements in NEC and NEMA standards.

SECTION 26 05 33 – RACEWAYS, BOXES, SEALS, AND FITTINGS FOR ELECTRICAL SYSTEMS: continued

- D. Use stainless-steel supports, clamps, and straps, and stainless-steel hardware to support aluminum conduit.
- E. Use stainless-steel or PVC-coated conduit straps to support PVC-coated rigid steel conduit.
- F. Use stainless-steel clamps for supporting PVC coated rigid steel conduit on stainless-steel supports.
- G. Use nonmagnetic conduit clamps to support nonmagnetic conduit.

3.05 CONCRETE BASES:

- A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3,000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in DIVISION 03 - Concrete.
- C. Anchor equipment to concrete base.
  - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.06 PAINTING:

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION 26 05 33

## SECTION 26 05 53 - ELECTRICAL IDENTIFICATION

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section specifies electrical identification work including the following:
  - 1. Arc flash labels.
  - 2. Operational instructions and warnings.
  - 3. Danger, caution and warning signs.
  - 4. Source of supply labels.
  - 5. Available fault current labels.

#### 1.02 REFERENCES:

- A. Applicable Standards: Comply with the applicable requirements of the following standards.
  - 1. American National Standards Institute (ANSI):
    - a. Z53.1-1979 - Safety Color Code for Marking Physical Hazards.
  - 2. Federal Specifications (FS):
    - a. FS L-P-387 - Plastic Sheet, Laminated, Thermosetting (for designation plates).
  - 3. National Fire Protection Association (NFPA):
    - a. 70 - National Electrical Code (NEC), as applicable to installation of identifying labels and markers for wiring and equipment.
  - 4. Occupational Safety and Health Administration (OSHA):
    - a. 29 CFR 1910.145 - Specifications for Accident Prevention Signs and Tags.
  - 5. Underwriters Laboratories (UL), pertaining to electrical identification systems:
    - a. 969-1991 - Marking and Labeling Systems.

#### 1.03 SUBMITTALS:

- A. Refer to DIVISION 01.
- B. Includes, but not limited to, the following:
  - 1. Product Data: Submit manufacturer's data on electrical identification materials and products.
  - 2. Samples: Submit samples of each color, lettering style, and other graphic representation required for each identification material or system.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS:

- A. Subject to compliance with requirements, provide electrical identification products of one of the following (for each type marker):
  - 1. Brady USA, Inc.
  - 2. Ideal Industries, Inc.
  - 3. Panduit Corp.
  - 4. Seton Name Plate Co.
  - 5. Thomas and Betts Corp.

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION: continued

2.02 ELECTRICAL IDENTIFICATION MATERIALS:

- A. General: Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is Installer's option; but provide single selection for each application.
- B. Self-Adhesive Plastic Signs:
  - 1. General: Self-adhesive or pressure-sensitive, preprinted, flexible vinyl signs for operational instructions or warnings; of sizes suitable for application areas and adequate for visibility, with proper wording for each application, e.g., "DANGER."
    - a. Colors: Unless otherwise indicated or required by governing regulations, provide white signs with black lettering.
  - 2. Arc Flash Labels:
    - a. Shall not be smaller than 4"H x 6"W in size.
    - b. The header shall read "DANGER".
    - c. The labels shall be printed with equipment designation, hazard category and required personnel protective equipment (PPE) requirements. Specific information for labels shall be provided, if applicable.
    - d. Shall be printed in English.
    - e. The colors shall be black/red on white.
  - 3. Source of Supply Labels:
    - a. Label shall read "Source of Supply" on the first line with the applicable equipment designation on the second line.
    - b. Minimum character height shall be 1/2".
    - c. The color shall be black on white.
  - 4. Available Fault Current Labels:
    - a. Label shall identify the maximum available fault current along with the date the fault current calculation was performed. Available fault current shall be provided, if applicable.
    - b. Minimum character height shall be 1/4".
    - c. The color shall be black on white.

PART 3 - EXECUTION

3.01 APPLICATION AND INSTALLATION:

- A. General Installation Requirements:
  - 1. Install electrical identification products as indicated, in accordance with manufacturer's written instructions and requirements of NEC.
  - 2. Coordination: Where identification is to be applied to surfaces which require finish painting, install identification after completion of painting.
  - 3. Regulations: Comply with governing regulations and requests of governing authorities for identification of electrical work.
  - 4. Provide and install arc flash labels on equipment and enclosures as specified.
  - 5. Provide and install source of supply labels on all panels supplied by feeder circuits as required by the NEC.

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION: continued

6. Provide and install available fault current labels on all service entrance equipment as required by the NEC.
- B. Operational Identification and Warning Plastic Signs:
  1. General: Wherever reasonably required to ensure safe and efficient operation and maintenance of electrical systems, and electrically connected mechanical systems and general systems and equipment, including prevention of misuse of electrical facilities by unauthorized personnel, install signs with instruction or warnings. When signs are installed on switches, outlets, controls, devices and covers of electrical enclosures they may be self-adhesive vinyl or plastic. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for intended purposes.

END OF SECTION 26 05 53

## SECTION 26 22 13 – LOW-VOLTAGE DISTRIBUTION TRANSFORMERS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

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

#### 1.02 SUMMARY:

- A. This Section specifies transformer work as indicated by Drawings and Schedules.
- B. Types of transformers specified in this Section include the following:
  - 1. Dry-type transformers

#### 1.03 RELATED REQUIREMENTS:

- A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cable.
- B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- C. Section 26 05 53 – Electrical Identification

#### 1.04 REFERENCE STANDARDS:

- A. Code of Federal Regulations (CFR):
  - 1. 10 CFR Part 429 - Certification, Compliance, and Enforcement for Consumer Products and Commercial and Industrial Equipment.
    - a. 429.47 - Distribution Transformers.
  - 2. 10 CFR Part 431 - Energy Efficiency Program For Certain Commercial and Industrial Equipment, Subpart K – Distribution Transformers.
    - a. 431.193 - Test procedures for measuring energy consumption of distribution transformers.
    - b. 431.196 - Energy Conservation Standards.
- B. Institute of Electrical and Electronics Engineers (IEEE):
  - 1. IEEE C2 - National Electric Safety Code.
  - 2. IEEE C57.12.01 - General Requirements for Dry-Type Distribution and Power Transformers.
  - 3. IEEE C57.12.50 - Requirements for Ventilated Dry-Type Distribution Transformers 1 to 500 kVA, Single-Phase, and 15 to 500 kVA, Three-Phase with High-Voltage 601 to 34,500V, Low Voltage 120-600V.
  - 4. IEEE C57.12.91 - Test Code for Dry-Type Distribution and Power Transformers.
- C. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA ST 20 - Dry-type Transformers for General Applications.
  - 2. NEMA TR 1 - Transformers, Regulators, and Reactors. (Supplements IEEE C57 - Series Standards.)
  - 3. NEMA 250 - Enclosures for Electrical Equipment.
- D. National Fire Protection Association (NFPA):
  - 1. NFPA 70 - National Electrical Code (NEC). Comply with NEC as applicable to installation and construction of electrical power/distribution transformers.
- E. Underwriters Laboratories (UL):
  - 1. Comply with applicable requirements of UL 506 Safety Standard for Specialty Transformers. Provide transformers and components which are UL-listed and labeled.
  - 2. UL 1561 - Dry-Type General Purpose Transformers.

SECTION 26 22 13 – LOW-VOLTAGE DISTRIBUTION TRANSFORMERS: continued

1.05 SUBMITTALS:

- A. Refer to Division 01 and Section 26 05 10 – General Electrical Requirements - for administrative and procedural requirements for submittals.
- B. Product Data: Submit for each type of product specified and included, with the following as a minimum:
  - 1. Technical product data: Includes, but not limited to, rated kVA, frequency, primary and secondary voltages, wiring diagram, percent taps, polarity, impedance and certification of transformer performance efficiency at 100% load, percentage voltage regulation at 100% load at 75°C, full-load losses in watts, percent impedance at 75°C, hot-spot and average temperature rise above 40°C ambient temperature, sound level in decibels, and standard published data.
- C. Shop Drawings: Submit the following as a minimum:
  - 1. Manufacturer's drawings indicating dimensions and weight loadings for transformers and wall brackets.
  - 2. Transformer nameplate data. [Include center of gravity information in seismic zones.]
  - 3. Wiring Diagrams: Submit wiring and control diagrams for transformers. Clearly differentiate between portions of wiring that are manufacturer factory installed and portions to be field-installed.
- D. Submit all field test data.
- E. Closeout Submittals: Final documentation shall include:
  - 1. Operation and Maintenance manuals.
  - 2. Certified “As-Built” drawings.
  - 3. Copies of all approved Product Data.
  - 4. Copies of all approved Test Reports.
  - 5. Warranty information.

1.06 QUALITY ASSURANCE:

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.
- B. Source Limitations: Obtain each transformer type through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with IEEE C2, National Electric Safety Code.
- E. Comply with IEEE C57.12.90, Test Code for Liquid-Immersed, Distribution, Power, and Regulating Transformers. or IEEE C57.12.91, Test Code for Dry-Type Distribution and Power Transformers.
- F. Testing procedures shall comply with 10 CFR 429.47 - Distribution Transformers and 10 CFR 431.193 - Test procedures for measuring energy consumption of distribution transformers.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Transformers shall be stored according to the manufacturer’s instructions and in a conditioned space to avoid condensation, dust, and other environmental contaminants.
- B. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

SECTION 26 22 13 – LOW-VOLTAGE DISTRIBUTION TRANSFORMERS: continued

- C. Handle and prepare transformers for installation according to NEMA ST 20 and manufacturer's instructions.

1.08 PROJECT SITE CONDITIONS:

- A. Environmental Limitations:
  - 1. Do not deliver or install transformers until spaces are enclosed and weather tight, any wet work is complete and dry, work above transformers is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
  - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
- B. Service Conditions: NEMA ST 20, usual service conditions, as follows:
  - 1. Ambient temperatures within limits specified.
  - 2. Altitude not exceeding 3,300 feet.

1.09 WARRANTY:

- A. All equipment furnished under this Section shall be warranted by the Contractor and the equipment manufacturer(s) for a minimum period of one year after substantial completion.
- B. Warranty shall include all parts, labor, and expenses to perform necessary work.

1.10 COORDINATION:

- A. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of wall-mounting and structure-hanging supports with actual transformer provided.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Subject to compliance with requirements, provide products of one of the following (for each type of transformer):
  - 1. Eaton.
  - 2. General Electric Company.
  - 3. Sola/Hevi-Duty, Emerson Electric Co.
  - 4. Siemens.
  - 5. Square D, Schneider Electric.

2.02 TRANSFORMERS:

- A. General:
  - 1. Except as otherwise specified or indicated, provide manufacturer's standard materials and components as indicated by published product information, designed and constructed as recommended by manufacturer, and as required for complete installation.
  - 2. Comply with DOE energy efficiency standards as defined by 10 CFR Part 431.196 – Energy Conservation Standards for all transformers 15 kVA and larger.
  - 3. Core material shall be grain-oriented, non-aging silicon steel. Coils shall be continuous windings without splices except for taps. Internal coil connections shall be brazed or pressure type.
  - 4. Enclosure ratings shall comply with NEMA 250 – Enclosures for Electrical Equipment.

SECTION 26 22 13 – LOW-VOLTAGE DISTRIBUTION TRANSFORMERS: continued

- B. Dry-Type Transformers (45 kVA or less):
1. Factory-assembled and tested, general-purpose, air-cooled, dry-type transformers; of sizes, characteristics, and rated capacities indicated.
  2. Three-phase transformer: 480V delta connected primary and 208/120V wye-connected secondary with grounded neutral, 60-hertz, 10 kV BIL.
  3. Copper primary and secondary windings. Manufacturer's standard impedance.
  4. Provide primary winding with 4 full-capacity taps; two 2-1/2% increments below and above full-rated voltage for de-energized tap-changing operation.
  5. Insulate with 220°C, UL-component-recognized insulation system with a maximum of 115°C rise above 40°C ambient temperature.
  6. Rate transformer for continuous operation at rated kVA.
  7. Limit transformer surface temperature rise to maximum of 65°C.
  8. Provide terminal enclosure, with cover, to accommodate primary and secondary winding connections and raceway connectors.
  9. Equip terminal leads with connectors installed. Limit terminal compartment temperature to 75°C when transformer is operating continuously at rated load with ambient temperature of 40°C. Provide wiring connectors suitable for copper wiring.
  10. Cushion-mount transformers with external vibration isolation supports.
  11. Sound-level ratings shall not exceed IEEE/NEMA standards. Conform to NEMA ST 20.
  12. Electrically ground core and coils to transformer enclosure by means of flexible metal grounding strap.
  13. Provide transformers with ventilated or fully enclosed sheet steel enclosures. Apply manufacturer's standard light gray indoor enamel over cleaned and phosphatized steel enclosure.
  14. All transformers shall be suitable for floor mounting unless noted otherwise.
  15. Provide wall mounting brackets for wall- or column-mounted transformers.
  16. Must comply with IEEE C57.12.01 and/or IEEE C57.12.50.
  17. Must comply with UL 1561.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.
- B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.
- C. Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.
- D. Verify that ground connections are in place and requirements in Section 26 05 26 – Grounding and Bonding for Electrical Systems have been met.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

- A. Install transformers as indicated, complying with manufacturer's written instructions, applicable requirements of NEC, NESC, NEMA, and IEEE standards in accordance with recognized industry practices to ensure that products fulfill requirements. Arrange equipment to provide adequate space for access and for cooling air circulation.

SECTION 26 22 13 – LOW-VOLTAGE DISTRIBUTION TRANSFORMERS: continued

- B. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.
- C. Install wall-mounting transformers level and plumb with wall brackets fabricated by transformer manufacturer. Wall brackets shall meet the environmental requirements of the transformer installation for each location.

3.03 CONNECTIONS:

- A. Provide equipment grounding connections for transformers as specified, indicated, and as required. Tighten connections to comply with tightening torques specified in UL 486A to assure permanent and effective grounding. Provide grounding in accordance with Section 26 05 26 – "Grounding and Bonding for Electrical Systems."

3.04 IDENTIFICATION:

- A. Provide identification of transformers as specified in Section 26 05 53 - Identification for Electrical Systems.
- B. Nameplates: Label each transformer with a nameplate complying with requirements for identification specified in Section 26 05 53 – Identification for Electrical Systems.

3.05 FIELD QUALITY CONTROL:

- A. Tests and Inspections:
  - 1. Prior to energization of transformers, check all accessible connections for compliance with manufacturer's torque tightening specifications. Clean out any dust and dirt.
  - 2. Prior to energization, check circuitry for electrical continuity and for short circuits.
  - 3. Perform insulation resistance test: Megger between high-voltage winding to low-voltage winding, low-voltage winding to ground, and high-voltage winding to ground. Record and submit test results. If readings are below 50 megohms (at 77°F), notify Engineer before energizing transformer.
  - 4. Check cooling fans and controls, where provided, for proper operation.
  - 5. Upon completion of installation of transformers and testing, energize primary circuitry at rated voltage and frequency from normal power source, and test transformers, including, but not limited to, audible sound levels, to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at the Site then retest to demonstrate compliance; otherwise, remove and replace with new units or components and proceed with retesting.
  - 6. Adjust transformer primary taps for nominal system voltage at initial installation and again when the transformer reaches its designed "full" load condition after occupancy by the Owner. Schedule all required electrical outages with the Owner.

3.06 FINISHES:

- A. Equipment coatings shall be free from scratches, rust, or other defects.
- B. All damaged or defective coatings shall be repaired prior to final acceptance.
- C. Field Painting:
  - 1. Touch Up:
    - a. Contractor shall prepare surfaces and touch up manufacturer applied coatings as required for any damage during shipment and installation.
    - b. Field painting shall be performed based on manufacturer's recommended procedures.

SECTION 26 22 13 – LOW-VOLTAGE DISTRIBUTION TRANSFORMERS: continued

- c. Transformer manufacturer shall furnish Contractor with an adequate quantity of touch-up paint to match the factory applied finish.

3.07 ADJUSTING AND CLEANING:

- A. Upon completion of installation, clean interior and exterior of transformers. Remove paint splatters, spots, dirt and debris.

3.08 PROTECTION:

- A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions until unit is placed into service.

END OF SECTION 26 22 13

## SECTION 26 24 16 - PANELBOARDS

### 1.01 RELATED DOCUMENTS:

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

### 1.02 SUMMARY:

- A. This Section specifies panelboards including cabinets and boxes, as indicated by Drawings and Schedules, and as specified herein.
- B. Types of panelboards and enclosures required for the Project include the following:
  - 1. Lighting and appliance branch-circuit panelboards.

### 1.03 RELATED REQUIREMENTS:

- A. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- B. Section 26 05 53 – Electrical Identification.

### 1.04 REFERENCE STANDARDS:

- A. Publication Dates: Comply with the latest standards revision in effect as of the date of the Contract Documents unless otherwise indicated.
- B. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA 250 – Enclosures for Electrical Equipment (1,000V Maximum).
  - 2. NEMA PB 1 – Panelboards.
  - 3. NEMA PB 1.1 – General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600V or Less.
- C. Underwriters Laboratories (UL): Provide panelboard units which are UL listed and labeled.
  - 1. UL 50 - Electrical Cabinets and Boxes.
  - 2. UL 67 - Electrical Panelboards.
  - 3. UL 486A - Wire Connectors and Soldering Lugs for Use with Copper Conductors.
  - 4. UL 489 - Molded-Case Circuit Breakers and Circuit Breaker Enclosures.
  - 5. UL 869A - Electrical Service Equipment.

### 1.05 SUBMITTALS:

- A. Submit as specified in Division 01 and Section 26 05 10 – General Electrical Requirements for administrative and procedural requirements for submittals.
- B. Submittals shall be custom prepared by the panelboard manufacturer for this specific application.
- C. Product Data: Submit for each type of product specified and included, with the following as a minimum:
  - 1. Data sheets for all components furnished as part of the system package.
- D. Shop Drawings: Provide the following as a minimum:
  - 1. Panelboard dimensions and weight.
  - 2. Complete data on circuit breakers.
  - 3. Panelboard short-circuit interrupting capacity, and information on buses: Phase, neutral, and ground.

SECTION 26 24 16 - PANELBOARDS: continued

4. Information on whether panelboard is fed from top or bottom.
  5. Data on maximum and minimum incoming and outgoing feeder and branch circuit wire size.
  6. Data on door, locks, and mounting: Surface or flush.
  7. Data on total number of poles and number of unused poles that is available for future use.
- E. Closeout Submittals: Final documentation shall include the following as minimum:
1. Operation and Maintenance Manuals including the following:
    - a. Operation and maintenance manuals for all components furnished.
    - b. Certified "As-Built" drawings of all equipment with information listed above.
    - c. Copies of all approved Product Data.
    - d. Copies of all approved Test Reports.
    - e. Warranty Information.
- F. Maintenance Material Submittals:
1. Furnish extra materials and spare parts that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
    - a. Keys: Two spares for each type of panelboard cabinet lock.

1.06 QUALITY ASSURANCE:

- A. Materials and Equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall be the manufacturer's latest standard design that has been in satisfactory use for at least one year prior to Bid opening.
- B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Panelboards shall comply with NEMA PB 1.
- E. Comply with NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Panelboards shall be stored according to the manufacturer's instructions and in a conditioned space to avoid condensation, dust, and other environmental contaminants.
- B. Handle and prepare panelboards for installation according to NEMA PB 1 and manufacturer's instructions.

1.08 PROJECT SITE CONDITIONS:

- A. Environmental Limitations:
  1. Do not deliver or install panelboards until spaces are enclosed, weathertight, dry, work above panelboards is complete, and temporary HVAC system is operating

SECTION 26 24 16 - PANELBOARDS: continued

and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

2. Service Conditions: Rate equipment for continuous operation under the following conditions unless otherwise indicated.
  - a. Ambient Temperature Limits: -5°C through 40°C.
  - b. Altitude not exceeding 6,600 feet.

1.09 COORDINATION:

- A. Coordinate the layout and installation of panelboards and components with other types of equipment including raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.10 WARRANTY:

- A. All equipment furnished under this Section shall be warranted by the Contractor and the equipment manufacturer(s) for a minimum period of one year after substantial completion.
- B. Warranty shall include all parts, labor, and expenses to perform necessary work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Subject to compliance with requirements, provide panelboard and mini-power center products of one of the following (for each type and rating of panelboard and enclosure):
  1. Eaton.
  2. General Electric Company.
  3. Siemens.

2.02 GENERAL REQUIREMENTS FOR PANELBOARDS:

- A. Except as otherwise indicated, provide panelboards, enclosures, and ancillary components of types, size, and ratings indicated, which comply with manufacturer's standard materials and with the design and construction in accordance with published product information.
- B. Where types, sizes, or ratings are not indicated, comply with NEC, UL, and established industry standards for those applications indicated.
- C. Equip with proper number of panelboard switching and protective devices as required for complete installation.
- D. Provide ground fault circuit interrupter type circuit breakers where indicated.
- E. Enclosures: Flush- and surface-mounted cabinets as indicated.
  1. Provide enclosures fabricated by same manufacturer as panelboards which mate and match properly with panelboards.
  2. Rated for environmental conditions at installed location. Provide NEMA type as indicated and as defined by NEMA 250, unless indicated or specified otherwise.

SECTION 26 24 16 - PANELBOARDS: continued

3. Must be UL 50 listed.
  4. Front: Secured to box with adjustable, concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
  5. Finishes:
    - a. Color: Baked gray enamel finish over a rust inhibitor coating.
    - b. Panels and Trim: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat for NEMA Type 12 and Type 3R. 304 Stainless steel for NEMA 4X
    - c. Back Boxes: Galvanized steel. 304 Stainless Steel for NEMA 4X panelboards.
  6. Directory Card: Inside panelboard door, equip with interior circuit directory frame and removable card with clear plastic covering.
- F. Phase, Neutral, and Ground Buses:
1. Bus shall be braced to withstand available short-circuit currents as indicated.
  2. Provide suitable lugs on neutral bus for incoming and outgoing feeders requiring neutral connections.
  3. Equipment Ground Bus: Bare, uninsulated, adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
  4. Material: Tin-plated aluminum.
- G. Conductor Connectors: Suitable for use with conductor material and sizes indicated and specified.
1. Material: Hard-drawn copper, 98% conductivity.
  2. Main and Neutral Lugs: Mechanical type.
  3. Ground Lugs and Bus-Configured Terminators.
  4. All lugs shall be mechanical type.
  5. Provide terminals UL rated for 75°C (minimum) conductors.
- H. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- I. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals as indicated.
- J. Surge Protection Devices: When indicated, provide a stand-alone surge protection device for each panelboard as specified. Refer to Section 26 43 13 – Surge Protection Devices for Low-Voltage Electrical Power Equipment for device requirements.
- K. Provide panelboard nameplate as indicated.

2.03 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS:

- A. Panelboards: NEMA PB 1, dead front, safety type, 208/120V, three-phase, 4 wire, 60 hertz with full-sized neutral bus.
- B. Lighting and appliance branch-circuit type as indicated with switching and protective devices in quantities, ratings, types, and arrangements shown.
- C. Incoming Mains Location: Top or bottom as required.
- D. Mains: Circuit breaker or lugs only as indicated.

SECTION 26 24 16 - PANELBOARDS: continued

- E. Branch Overcurrent Protective Devices:
  - 1. Bolt-on, molded-case circuit breakers.
  - 2. Molded-case circuit breakers shall have toggle handles that indicate when tripped.
  - 3. Where multiple pole breakers are indicated, provide with common trip so overload on one pole will trip all poles simultaneously.
  - 4. Circuit breakers shall be replaceable without disturbing adjacent units.
- F. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- G. Provide spare breakers as indicated.
- H. Provide an integral surge protection device to protect the panelboard when indicated.

2.04 SURGE PROTECTION DEVICE (SPD):

- A. Shall be UL 1449 listed and labeled. Shall be UL labeled as Type 1 or Type 2 and intended for installation on the load side of the service entrance equipment and shall not require any external or supplemental controls to meet UL 1449.
- B. Shall provide independent, directly-connected suppression components on each mode in the electrical distribution system, at least seven modes in Wye systems (L-N, L-G, N-G) and six modes (L-L, L-G) in Delta and impedance grounded Wye systems.
- C. Shall use metal oxide varistor (MOV) or MOV-hybrid technology. Spark gaps, selenium cells, and SCRs are not acceptable.
- D. Shall include internal fuses and thermal protection over every suppression component of every mode, including N-G.
- E. Shall have integral, panel front status monitors or remote status panel ability as a minimum to indicate a continuous positive status of all protected modes, including N-G. Diagnostics shall be electrically isolated to prevent damage by surges.
- F. Shall be UL labeled with a short circuit current rating of 200kA.
- G. Shall have a minimum peak surge current of 120kA per phase unless otherwise indicated.
- H. The maximum continuous operating voltage at 60 Hz shall be capable of sustaining at least 115% of the peak voltages continuously without degrading.
- I. Shall include EMI/RFI filtering (minimum of -30dB at 100kHz) and include ring wave suppression. Shall be UL 1283 listed. Filters in the N-G mode are not acceptable.
- J. Shall be directly mounted/connected to the bus.
- K. Monitoring/Accessories:
  - 1. Front indication panels shall match the NEMA rating of the enclosure.
  - 2. Protection Status Indicators - Each unit shall have a green/red solid-state indicator light that reports the status of the protection element for each node or phase.
    - a. A GREEN light shall indicate node protection is functional. A RED light shall indicate damage/fault with the associated node protection. An OFF light shall indicate the absence of power at the protected node. If power is removed from any one phase, the indicator lights of unaffected phases must continue to indicate. Diagnostics packages that simply indicate whether power is present on a particular phase are not acceptable.
  - 3. SPD shall include a general alarm output relay (Form C, min. 2A at 250-Vac) for customer connection.
  - 4. SPD shall include an audible horn that sounds on a general fault. Include silence button.
  - 5. Surge Event Counter: The SPD shall be equipped with an LCD display that indicates quantity of surge events at the location.

SECTION 26 24 16 - PANELBOARDS: continued

- a. The surge counter shall trigger each time a surge event requires an MOV to activate. A reset pushbutton shall also be standard, allowing the surge counter to be zeroed. The reset button shall contain a mechanism to prevent accidental resetting of the counter via a single, short-duration button press.
- b. The ongoing surge count shall be stored in non-volatile memory. If power to the SPD is completely interrupted, the ongoing count indicated on the surge counter's display prior to the interruption shall be stored in non-volatile memory and displayed after power is restored.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.
- B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- C. Verify Site conditions are suitable for installation of equipment.
- D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF PANELBOARDS:

- A. Install panelboards, mini-power centers, and enclosures as indicated, providing NEC required working space, in accordance with manufacturer's written instructions, applicable requirements of NEC and in compliance with recognized industry practices to ensure that products fulfill requirements.
- B. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.
- C. Fasten enclosures firmly to walls and structural surfaces, ensuring that they are permanently and mechanically anchored.
- D. Provide properly wired electrical connections for panelboards within enclosures.
- E. Install numbers on all circuit breakers and type the panelboard's circuit directory card upon completion of installation work. Clearly identify the load on each circuit and the circuit number according to the Contract Drawings.
- F. Provide filler plates in all unused spaces.
- G. Provision for future circuits at all flush mounted panelboards: Install four 1-inch empty conduits from panelboard into a wall mounted wireway above the panelboard.

3.03 GROUNDING:

- A. Provide equipment grounding connections for panelboard enclosures as indicated and as required by NEC. Tighten connections to comply with tightening torques specified in UL 486A to assure permanent and effective grounds. Provide grounding as specified in Section 26 05 26 – Grounding and Bonding for Electrical Systems.

SECTION 26 24 16 - PANELBOARDS: continued

3.04 IDENTIFICATION:

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 26 05 53 – Electrical Identification.
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate equipment served and room designations as indicated on the Drawings. Use a computer or typewriter to create directory; handwritten directories are not acceptable. Panelboard directory shall be subject to approval by the Engineer.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 05 53 – Electrical Identification.
- D. Device Nameplates: Label each branch circuit device in power distribution panelboards with a nameplate complying with requirements for identification specified Section 26 05 53 – Electrical Identification.

3.05 FIELD QUALITY CONTROL:

- A. Perform tests and inspections as specified and as recommended by the equipment manufacturer.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Acceptance Testing Preparation:
  - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- C. Tests and Inspections:
  - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 3. Prior to energization of electrical circuitry, check all accessible connections to manufacturer's tightening torque specifications.
  - 4. Prior to energization, check panelboard circuits for short circuits, electrical continuity of circuits, enclosure grounding and neutral grounding at service entrance and at incoming derived source transformer.
  - 5. Prior to energization of panelboards, check with insulation resistance tester the phase-to-phase and phase-to-ground insulation resistance levels of each phase bus to ensure requirements are fulfilled. Record and submit test results.
  - 6. Panelboards will be considered defective if they do not pass tests and inspections.
  - 7. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

SECTION 26 24 16 - PANELBOARDS: continued

3.06 FINISHES:

- A. Equipment coatings shall be free from scratches, rust, or other defects.
- B. All damaged or defective coatings shall be repaired prior to final acceptance.
- C. Field Painting:
  - 1. Touch Up:
    - a. Contractor shall prepare surfaces and touch up manufacturer applied coatings as required for any damage during shipment and installation.
    - b. Field painting shall be performed based on manufacturer's recommended procedures.
    - c. Panelboard manufacturer shall furnish Contractor with an adequate quantity of touch-up paint to match the factory applied finish.

3.07 ADJUSTING AND CLEANING:

- A. Adjust moving parts and operable components to ensure normal function as recommended by manufacturer.
- B. Upon completion of installation, clean interior and exterior of panelboards. Remove paint splatters, spots, dirt and debris.
- C. Touch-up scratched or marred surfaces to match original finishes.

END OF SECTION 26 24 16

## SECTION 26 27 26 – WIRING DEVICES

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

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

#### 1.02 SUMMARY:

- A. This Section covers wiring devices for lighting and utilization equipment including but not limited to the following:
  - 1. Receptacles.
  - 2. Switches.
  - 3. Wall Plates.
  - 4. Plugs.

#### 1.03 RELATED REQUIREMENTS:

- A. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- B. Section 26 05 33 – Raceways, Boxes, Seals and Fittings for Electrical Systems.
- C. Section 26 50 00 – Lighting Devices.

#### 1.04 REFERENCE STANDARDS:

- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- B. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA WD 1 – General Color Requirements for Wiring Devices.
  - 2. NEMA WD 6 – Wiring Devices - Dimensional Specifications.
  - 3. NEMA 410 – Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts.
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 70 – National Electrical Code (NEC).
- D. Underwriters Laboratories (UL):
  - 1. UL 20 – General-Use Snap Switches.
  - 2. UL 486A-486B – Wire Connectors.
  - 3. UL 498 – Attachment Plugs and Receptacles.
  - 4. UL 514D – Cover Plates for Flush-Mounted Wiring Devices.
  - 5. UL 943 – Ground-Fault Circuit-Interruptioners.
- E. Federal Specification (Fed. Spec.):
  - 1. Fed. Spec. W-C-596 – Connector, Electrical, Power, General Specifications.
  - 2. Fed. Spec. W-S-896 – Switches, Toggles (Toggle and Lock), Flush-Mounted.

#### 1.05 SUBMITTALS:

- A. Refer to Division 01 and Section 26 05 10 – Basic Electrical Requirements for administrative and procedural requirements for submittals.
- B. Product Data for each product specified.

SECTION 26 27 26 – WIRING DEVICES: continued

1.06 QUALITY ASSURANCE:

- A. Conform to the requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum 3 years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Wiring devices shall be packaged and shipped to the project site to avoid damage.
- B. Store in a clean, dry space in original manufacturer's packing to avoid condensation, dust, and other environmental contaminants until ready for installation.

1.08 SEQUENCE AND SCHEDULING:

- A. Schedule installation of wiring devices and associated wall plates after the surface upon which they are installed has received the final finish.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Appleton, Emerson Electric Co.
- B. Cooper, Crouse-Hinds, Division of Eaton.
- C. Hubbell, Inc.
- D. Leviton Manufacturing Co., Inc.
- E. Pass & Seymour, Legrand North America, Inc.
- F. Russellstoll, Thomas & Betts.
- G. Woodhead, Molex.
- H. Source Limitation: Wiring device and associated wall plate shall be supplied from a single manufacturer for each type of device for consistency throughout project.

2.02 RECEPTACLES:

- A. General:
  - 1. All receptacles shall be heavy-duty type and shall bear a UL 498 label and comply with NEMA WD 1 and WD 6 as applicable.
  - 2. Provide all necessary wiring and accessories as required for complete installation.
- B. Flush-Mounted and Surface-Mounted Receptacles:
  - 1. Rated 20A at 125Vac.
  - 2. Duplex, arc-resistant, back and side-wired, 3-wire grounding type. NEMA reference 5-20R.
  - 3. Receptacle and wall plates shall be as follows:
    - a. Surface-mounted receptacles shall be grey and have cast copper-free aluminum FS or FD single or multiple gang boxes with matching cast aluminum 302 stainless steel cover plate.
  - 4. "Specification" grade type 5362, Fed. Spec. W-C-596 compliant, NEMA reference 5-20R.
  - 5. Locations as indicated.
  - 6. When indicated provide GFCI type as specified in this Section.
- C. Ground Fault Circuit Interrupter (GFCI) Receptacles:

SECTION 26 27 26 – WIRING DEVICES: continued

1. Flush or surface mounted as indicated.
  2. Rated 20A at 125Vac, Fed. Spec. W-C-596.
  3. Back and side wired terminals with feed-through design.
    - a. Terminal installation unless indicated otherwise.
  4. UL Standard 943 Class A, Group 1.
  5. Leakage current sensitivity: 5 mA  $\pm$  1 mA.
    - a. Opens circuit within 25 milliseconds of reaching 5 mA.
  6. Duplex, arc resistant and pre-wired.
  7. Cover plate materials and colors shall match standard receptacles as specified this Section.
  8. FD box.
  9. Locations as indicated.
- D. Weatherproof Receptacles:
1. Flush or surface mounted as indicated.
  2. Rated 20A at 125Vac, Fed. Spec. W-C-596. NEMA reference 5-20R.
  3. GFCI receptacle as specified in this Section when indicated.
  4. Provide a gray receptacle with a cast aluminum weather-proof cover.
    - a. Provide while in use cover for outdoor locations unless indicated otherwise.
    - b. Provide hinged self-closing, gasketed type covers for indoor damp locations.
  5. FS or FD boxes.
  6. Locations as indicated.

2.03 SWITCHES:

- A. General:
1. All switches and associated materials shall bear a UL 20 label and comply with NEMA WD 1.
  2. Provide all necessary wiring and accessories as required for complete installation.
- B. All single-pole, double-pole, three-way, and four-way switches as indicated.
- C. Surface-Mounted, Tumbler, Self-Grounding, Heavy-Duty Switches:
1. Rated 20A at 120V or 277Vac.
  2. "Specification" grade (Fed. Spec. W-S-896) switch with gray toggle.
  3. FS and FD single or multiple gang cast boxes.
  4. Cast aluminum cover plates and matching countersunk screws.
  5. Locations indicated.
- D. Weatherproof, Self-Grounding, Heavy-Duty Switches:
1. Rated 20A at 120V or 277Vac.
  2. Gray toggle.
  3. Flush or surface mounted as indicated.
  4. FS or FD boxes with PVC gasketing.
  5. "Specification" grade. Fed. Spec. W-S-896.
  6. Lever-type, cast aluminum, gasketed cover plate.
    - a. Cooper, Crouse-Hinds No. DS185 or engineer approved equal.
  7. Locations indicated.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General:

1. Install wiring devices and accessories in accordance with manufacturer's written instructions, and in accordance with recognized industry practices.
2. Coordinate with other work, including painting, electrical boxes, and wiring installation.
3. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A-486B.
4. Install wiring devices only in electrical boxes which are clean - free from building materials, dirt, and debris.
5. Painting work shall be completed prior to device wall plate installation.

B. Receptacles:

1. Mount receptacles outlets 1'-6" (450 mm) above floor, walkways, or finished grade unless indicated otherwise.

C. Switches:

1. Mount 4 feet (1.2 meters) above floor, walkways, or finished grade unless indicated otherwise.
2. Install close to trim on lock side when located near doors.

D. Wiring Circuits:

1. Home Run Groupings:
  - a. Group in home runs where each phase has a dedicated neutral. Sharing of common neutral is prohibited.
  - b. Circuits which are protected by ground fault circuit interrupter (GFCI) devices shall use their own separate and isolated neutral between the GFCI device and load.
2. Use circuit numbers as indicated.
3. Use type SVN3 wire for lighting and receptacle circuits unless indicated otherwise.
4. Do not install wire smaller than No. 12 AWG.
5. Install larger size wire as indicated or required to conform to requirement of NFPA 70 (NEC).
6. Install in concealed and exposed conduit systems as indicated.

3.02 PROTECTION:

- A. Protect installed devices from damage.
- B. Devices and wall plates that are damaged, stained, or painted shall be replaced prior to final acceptance.

3.03 FIELD QUALITY CONTROL:

A. Testing:

SECTION 26 27 26 – WIRING DEVICES: continued

1. Prior to energizing circuits, test wiring for electrical continuity and for short-circuits. Ensure proper polarity of connections is maintained.
2. After circuits are energized, test wiring devices and demonstrate compliance with requirements.
  - a. Test each receptacle with a receptacle tester to ensure proper polarity.
  - b. Test ground fault circuit interrupters with the local test button and with a receptacle tester to simulate a remote ground fault.
  - c. Test ballasts for overcurrent protection in accordance with NEMA 410.

END OF SECTION 26 27 26

## SECTION 26 50 00 - LIGHTING DEVICES

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes the following:
  - 1. Interior lighting.
  - 2. Luminaires.
  - 3. All necessary mounting, wiring and accessories required.
- B. Related Work Specified Elsewhere:
  - 1. Section 26 27 26 - Wiring Devices
  - 2. SVN3 Cable data sheet

#### 1.02 REFERENCES:

- A. Applicable Standards:
  - 1. American National Standards Institute (ANSI):
    - a. C73 Series - Plugs and Receptacles.
    - b. C78 series:
      - (1) Electric Discharge Lamps (H.I.D.).
  - 2. Illuminating Engineering Society of North America (IESNA).
  - 3. National Electrical Code (NEC).
  - 4. National Electrical Manufacturers Association (NEMA).
  - 5. Reflector and Lamp Manufacturers (RLM) Standards Institute - Industrial Lighting Units.
  - 6. Underwriters' Laboratories, Inc. (UL).
  - 7. Federal Specification (Fed. Spec.):
    - a. W-C-596 - Connector, Electrical Power.
    - b. W-S-896 - Switches, Toggles (Toggle and Lock), Flush Mounted.

#### 1.03 SUBMITTALS:

- A. Submit as specified in DIVISION 01.
- B. Includes, but not limited to, the following information for each luminaire for the lamp specified:
  - 1. Detailed construction drawings.
  - 2. Driver information.
  - 3. Photometric data.
  - 4. Catalog data.
  - 5. Lamp type and color.

### PART 2 - PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS:

- A. Luminaires
  - 1. Refer to Luminaire Schedule on the Contract Drawings.

#### 2.02 GENERAL REQUIREMENTS:

SECTION 265000 - LIGHTING DEVICES: continued

- A. All equipment and materials to bear UL label.
- B. Equipment and materials to be designed to meet the quality and level of illumination established by specified luminaires.
- C. Provide all necessary wiring and accessories as required for complete installation.

2.03 SYSTEMS:

- A. 208Y/120-V 3-phase, 4-wire system with identified grounded neutral and separate ground wire for lighting, receptacles, and small power.
- B. Individually mounted battery-operated emergency lighting units.

2.04 LUMINAIRES:

- A. General:
  - 1. Interior luminaires to operate in the following maximum ambient temperatures:
    - a. 48°C (117°F), for workshops, mechanical equipment, and electrical equipment rooms.
- B. Furnish luminaires in accordance with the Luminaire Schedule on the Contract Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Luminaires:
  - 1. Install after pipe, conduit, air ducts and other equipment above luminaires are installed, unless otherwise acceptable to Engineer.
  - 2. Place accurately as to line and level, and at elevations indicated.
  - 3. Shift location if required to avoid interference with plant piping or other apparatus or material.
  - 4. Clean and fully lamp with new lamps.
  - 5. Complete with all required accessories just prior to final acceptance.
  - 6. Install as indicated.
- B. Emergency Lighting System:
  - 1. Conform to manufacturer's instructions.
  - 2. Install at elevations indicated.
  - 3. Shift locations if required to avoid interference with plant piping, ducts, or other apparatus or material.
- C. Wiring Circuits:
  - 1. Home Run Groupings:
    - a. 120/208-volt, single-phase, 3-wire systems. Group in home runs with not more than one conductor of each phase and a suitably sized separate neutral for each phase in one conduit as in accordance with the National Electrical Code.
    - b. Circuits which are protected by ground fault interruption (GFCI) devices shall use their own separate and isolated neutral between the GFCI device and load.

SECTION 265000 - LIGHTING DEVICES: continued

- c. All neutral conductors shall be suitably sized to carry the fundamental plus any harmonic currents present.
2. Use circuit numbers as indicated.
3. Use cable type SVN3 wire for lighting and receptacle circuits unless indicated otherwise.
4. Do not install wire smaller than No. 12 AWG.
5. Install larger size wire as indicated or required to conform to requirement of NEC.
6. Install in concealed and exposed conduit systems as indicated.
7. Isolate Emergency Lighting circuit conductors from all other wiring.

END OF SECTION 26 50 00

DIVISION 31 – EARTHWORK

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 SUMMARY:

- A. This Section includes:
  - 1. All subgrade preparation.
  - 2. Fly ash stabilized subgrade.
  - 3. Excavating.
  - 4. Trenching.
  - 5. Filling.
  - 6. Embankment construction.
  - 7. Backfilling
  - 8. Compacting.
  - 9. Grading.
  - 10. Riprapping.
  - 11. Topsoiling.
  - 12. All related items necessary to complete the Work indicated or specified.

1.03 REFERENCE STANDARDS:

- A. Applicable Standards:
  - 1. ASTM International (ASTM):
    - a. ASTM C33 – Standard Specification for Concrete Aggregates.
    - b. ASTM C88 – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
    - c. ASTM C94 – Standard Specification for Ready-Mix Concrete.
    - d. ASTM C144 – Standards Specification for Aggregate for Masonry Mortar.
    - e. ASTM C150 – Standard Specification for Portland Cement.
    - f. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
    - g. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
    - h. ASTM C403 – Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
    - i. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
    - j. ASTM C939 – Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
    - k. ASTM C940 – Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
    - l. ASTM D75 – Standard Practice for Sampling Aggregates.
    - m. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup>)

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

- n. ASTM D1140 – Standard Test Methods for Determining the Amount of Material in Soils Finer than 75- $\mu$ m (No. 200) Sieve in Soils by Washing.
- o. ASTM D1241 – Standard Specification for Materials for Soil-Aggregate Subbase, Base, and Surface Courses.
- p. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil In-place by the Sand Cone Method.
- q. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft-lbf/ft<sup>3</sup>.
- r. ASTM D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- s. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- t. ASTM D3776 – Standard Test Methods for Mass per Unit Area (Weight) of Fabric.
- u. ASTM D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
- v. ASTM D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- w. ASTM D4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- x. ASTM D4546 – Standard Test Methods for One-Dimensional Swell or Collapse of Soils.
- y. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- z. ASTM D4751 – Standard Test Method for Determining the Apparent Opening Size of a Geotextile.
- aa. ASTM D4832 – Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
- bb. ASTM D4833/D4833M – Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- cc. ASTM D5084 – Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
- dd. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- 2. Occupational Safety and Health Administration (OSHA):
  - a. 29 CFR Part 1926 - Safety and Health Regulations for Construction.
- 3. Missouri Department of Transportation (MoDOT):
  - a. Missouri Standard Specifications for Highway Construction, 2018.
- 4. Kansas City Metropolitan Chapter of the American Public Works Association, current version.

1.04 SUBMITTALS:

- A. Submit as specified in Division 1.
- B. Includes, but not limited to, the following:
  - 1. Test results from laboratory testing of proposed borrow material.
  - 2. Test results from laboratory testing of granular material and trench stabilization material.
  - 3. Dewatering Plan.
  - 4. Sheet piling and Shoring Excavation Plan.
- C. Where selecting an option for excavation, trenching, and shoring in compliance with local, state, or federal safety regulations such as OSHA 29 CFR Part 1926 or successor regulations,

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

which require design by a registered Professional Engineer, submit for information only and not for Engineer approval the following:

1. Copies of design calculations and notes for sloping, benching, support systems, shield systems, and other protective systems prepared by or under the supervision of a Professional Engineer legally authorized to practice in the jurisdiction where the Project is located.
2. Documents provided with evidence of registered Professional Engineer's seal, signature, and date in accordance with appropriate state licensing requirements.

1.05 QUALITY ASSURANCE:

A. Sampling and Testing:

1. Tests to determine conformance with all requirements of this Specification for quality and properties of all Contractor -secured materials, including borrow materials (both on- or off-site) proposed for use, shall be performed by an independent, commercial laboratory retained and compensated by Contractor, and approved by Engineer.
2. When incorporating materials into the Project, quality control testing will be performed during construction by a testing laboratory retained and compensated by Owner and Coordinated by the Contractor.

1.06 PROJECT CONDITIONS:

- A. Lines and grades shall be as indicated. Owner will furnish benchmarks, base lines, and reference points as necessary to permit Contractor to lay out and construct the Work properly.
- B. Carefully maintain all benchmarks, monuments, and other reference points and replace as directed by Engineer if disturbed or destroyed.
- C. Temporary Erosion and Sediment Controls: Furnish, install, construct, and maintain temporary measures to control erosion and minimize the siltation of intermittent streams and the pollution of private properties. Temporary erosion and sediment control measures shall be constructed in substantial compliance with local, state, federal, and jurisdictional agency's regulations Contract Drawings, and Section 01570. Temporary erosion and sediment control measures shall be maintained until completion of the Work.
- D. Disposition of Utilities:
  1. Existing underground utilities are shown on Contract Drawings using the best information available at the time of Drawing preparation. Contractor shall identify, locate and protect all underground utilities which may be affected by construction under this Contract before starting excavation or other Site construction activities which could damage existing utilities.
  2. Remove or relocate only as indicated, specified, or directed. Provide a minimum 48-hours' notice to Engineer and receive written notice to proceed before interrupting any utility service.
  3. Adequately protect from damage all active utilities and remove or relocate only as indicated or approved.
  4. Report active, inactive, and abandoned utilities encountered in excavating and grading operations that are not indicated on Contract Drawings. Remove, plug, or cap as directed by Engineer.
  5. Provide as-constructed Drawings of underground facilities either not shown or found at locations that differ from those shown on Contract Drawings.
- E. Survey Work, to accurately determine locations, elevations, and quantities of Contract pay items, shall be performed during the course of construction by Professional Surveyor registered

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

in the state of Missouri. Surveyor shall be retained and compensated by Contractor. Contractor shall notify Engineer prior to commencing survey work.

PART 2 - PRODUCTS

2.01 MATERIALS ENCOUNTERED:

- A. Suitable Materials: Materials suitable for use in embankment and fill include material that is free of debris, roots, organic matter, frozen matter, and which is free of stone having any dimension greater than 2 inches in areas requiring a high degree of compaction, or 4 inches in other embankment and fill areas:
  - 1. Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands generally exclusive of clayey and silty material with the following properties:
    - a. Are free-draining.
    - b. Impact compaction will not produce a well-defined moisture-density relationship curve.
    - c. Maximum density by impact methods will generally be less than by vibratory methods.
    - d. Generally less than 15% by dry weight of soil particles pass a No. 200 square-mesh sieve.
  - 2. Cohesive materials include materials made up predominately of silts and clays generally exclusive of sands and gravel with the following properties:
    - a. Impact compaction will produce a well-defined, moisture-density relationship curve.
    - b. Are not free draining.
- B. Unsuitable Materials: Materials unsuitable for use in embankment and fill include all material that contains debris, roots, organic matter, frozen matter, shale particles, or material containing gravel or stone with any dimension greater than 2 inches in areas requiring a high degree of compaction or 4 inches in other embankment and fill areas, or other materials that are determined by Engineer as too wet or otherwise unsuitable for providing a stable subgrade or stable foundation for structures.
- C. Material used for embankment or fill:
  - 1. For soils used below structural elements, such as footings, slabs, pavements, and mats, that portion of material passing the No. 40 square-mesh sieve shall have a liquid limit not exceeding 40 and a plasticity index not exceeding 25 when tested in accordance with ASTM D4318.
- D. All Materials encountered, regardless of type, character composition and condition thereof, shall be considered "unclassified" for the purpose of payment. Determine quantity of various materials to be excavated prior to submitting Bid. Rock encountered shall be handled at no extra cost to Owner.
- E. Waste Materials:
  - 1. Waste materials, as described for purposes of this Section, consist of unsuitable materials, excess suitable material, rock, demolition debris, and other materials considered unacceptable for use as fill, and which are not environmentally contaminated. Waste materials shall not include environmental pollutants, hazardous substances, contaminated products, by-products, samples, or waste materials of any kind that are regulated under environmental laws.
  - 2. Dispose of waste materials in accordance with Paragraph 3.03G.

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

2.02 BORROW MATERIALS:

- A. Suitable fill materials, granular materials, and topsoil obtained from locations arranged for by Contractor (off the Site). Required to the extent sufficient suitable materials are not obtained from excavation and trenching.
- B. Obtain, excavate, haul, handle, place, and compact borrow materials.
- C. Borrow materials shall not exhibit characteristics of high shrink-swell potential as determined from Atterberg limit tests ASTM D4318 and/or swell tests ASTM D4546 unless otherwise specified herein.

2.03 GRANULAR MATERIAL:

- A. Crushed stone or crushed gravel indicating a loss of not more than 15% after five cycles when tested for soundness with sodium sulfate as described in ASTM C88 and conforming to one of the following gradations:

<u>Standard Square Mesh Sieve</u>		<u>ASTM C33</u>
<u>U.S. Size or No.</u>	<u>Percent Passing</u>	<u>No. 67 Stone</u>
		<u>Percent Passing</u>
1 inch	--	100
3/4 inch	100	90 to 100
1/2 inch	60 to 100	--
3/8 inch	--	20 to 55
No. 4	0 to 5	0 to 10
No. 8	--	0 to 5

Use at all locations where granular material is required unless otherwise indicated or specified.

2.04 EMBANKMENT AND FILL MATERIAL:

- A. Material shall be free of roots or other organic matter, refuse, ashes, cinders, frozen earth, or other unsuitable material.
- B. Use suitable material sufficiently friable for embankment to provide a dense mass free of voids and capable of satisfactory compaction.
- C. Do not use material containing gravel, stones, or shale particles greater in dimension than one-half the depth of the layer or lift to be compacted.
- D. Moisture content shall be that required to obtain specified compaction of the soil or as indicated.
- E. Perform moisture curing by wetting or drying of the material as required to attain required compaction criteria.

2.05 TRENCH STABILIZATION MATERIAL:

- A. Granular material as specified or conform to ASTM D1241, Gradation A or B, well-graded, with not more than 10% passing No. 200 sieve.

2.06 RIPRAP:

- A. Riprap Material for the Rock Blanket shall be MoDOT Type 2 Rock Blanket in accordance with MoDOT Section 611.30 Rock Blanket.
- B. Riprap material for all other requirements:
  - 1. Quarry-run stone with stones weighing 80 to 150 lbs. each. At least 90% shall weigh more than 80 lbs. each.
  - 2. Stones shall be durable, free from cracks, seams, and other defects which would tend to increase deterioration from natural causes.

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

3. Dirt, sand, or clay shall not exceed 5% by weight.
4. Quantity of rock with an elongation greater than 3:1 shall not exceed 20% of the mass. No stone shall have an elongation greater than 4:1.
5. Not more than 10% of the stone shall show splitting, crumbling, or spalling when subjected to five cycles of the sodium soundness test as required by ASTM C88.
6. In lieu of conforming to above specified test requirements, material with a proven history of satisfactory performance may be approved for use in the Work provided certification of this history is acceptable to Engineer.

C. Filter Material:

1. Filter Blanket:

- a. Material shall be crushed rock with the following gradation:  
Standard Square-Mesh Sieve

<u>U.S. Size or No.</u>	<u>Metric Opening</u>	<u>Percent Passing by Weight</u>
4 inch	100.00 mm	100
3 inch	75.00 mm	80 to 100
2 inch	50.00 mm	70 to 90
3/4 inch	19.00 mm	45 to 60
No. 4	4.75 mm	20 to 30
No. 10	2.00 mm	5 to 15
No. 40	425 µm	0 to 5

- b. Gradation shall not vary from low limit on one sieve to high limit on adjacent sieve or vice versa.
- c. Sampling procedure shall conform to ASTM D75/D75M.
- d. Material shall not have a loss of more than 15% after five cycles when tested for soundness with sodium sulfate as described in ASTM C88.

2.07 FLY ASH FOR SOIL STABILIZATION:

- A. Stabilize with Class "C" fly ash conforming to ASTM C618 and with a minimum compressive strength of 500 psi at seven days.
- B. Fly ash shall be supplied and transported dry to the Site by Contractor.
- C. Water used in fly ash stabilization process shall be potable unless otherwise approved by Engineer.

2.08 CONTROLLED LOW-STRENGTH MATERIAL CLSM OR FLOWABLE FILL:

A. Materials:

1. Portland cement Type I or Type II conforming to ASTM C150/C150M.
2. Fly ash conforming to ASTM C618 for Class C.
3. Fine aggregate (sand) conforming to ASTM C33 or C144.
4. Water, clean and potable, conforming to ASTM C94.
5. Shrinkage compensator shall be proportioned in accordance with the manufacturer's recommendations, and as tested by ASTM C940.
6. Admixtures for air entrainment or other purposes conforming to ASTM C173/C173M or C231/C231M, or other appropriate standards referenced by manufacturer.

B. Mix Design:

1. Mix design for CLSM (flowable fill) shall be in accordance with the requirements of Section 2100 of the Kansas City Metropolitan Chapter of the American Public Works Association.

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2. Submit details of the proposed mix design along with strength test results from an approved laboratory retained by Contractor. Commercial brand mixtures that have documented prior mix design strength history may be used with prior submittal of appropriate test results, mix design indicating conformance with these requirements, and approval by Engineer.
3. Mix design shall permit adjustments in proportions of fine aggregate and/or water to achieve proper solid suspension and optimum flowability with approval of Engineer, and providing for the calculated yield to be maintained at 1 yd.<sup>3</sup> for the given batch weights.
4. Mix design shall meet requirements for minimum and/or maximum strengths indicated.
5. Consistency of the mix shall be that of a batter, not thin and/or watery.
6. Typical design for trial mixes of CLSM (flowable fill)], unless otherwise indicated to provide a minimum volume of 1 yd.<sup>3</sup> for CLSM is as follows:
  - a. Type 1 or Type II Portland cement.
  - b. Fly ash, when used, shall conform to ASTM C 618 Class C or F.
  - c. Fine aggregate shall conform to ASTM C 33.
  - d. Mixing water shall conform to ASTM C 1602.
  - e. Admixtures shall conform to the following:
    - (1) ASTM C 260 for air entrainment.
    - (2) ASTM C 494 for water reducing.
  - f. All other materials shall require the approval of the Engineer.
7. Removable CLSM shall be used unless otherwise specified or indicated.
8. Bentonite powder, if required, shall be blended with the cement and fly ash prior to adding any water to the mix, with a minimum of 20% by dry weight of combined cement and fly ash cementitious material. Blending and mixing of bentonite shall be complete and uniform, without balling-up or concentration of bentonite in clumps. Proportions of mix and mixing placement shall not adversely affect overall physical properties required for the in-place CLSM, yet provide for self-healing of any cracks that may develop over time due to shrinkage or other forces upon CLSM.
9. Flowable fill (CLSM) shall exhibit the following physical properties:
  - a. Shrinkage Compensator In accordance with manufacturer
  - b. Minimum unconfined compressive strength range of 75 psi at 28 days.
  - c. Maximum unconfined compressive strength of 150 psi at 28 days.
  - d. In place compressive strength of a maximum of 110% of design compressive strength after one year.
  - e. Provide for set-up within 12 hours.
  - f. Evaporation of bleed water shall not result in shrinkage of more than 1/8 inch per ft. of flowable fill (CLSM) thickness.
  - g. Unit weight of 105 to 125 lbs. per ft.<sup>3</sup>, as measured at the point of placement after transport.

PART 3 - EXECUTION

3.01 DEMOLITION:

- A. Remove existing structures and improvements as required (as indicated) to perform new construction.
- B. Carefully dismantle, in a manner to avoid damage, all materials and equipment indicated to be relocated or returned to Owner.

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- C. Material or equipment, specified or indicated to be relocated or returned to Owner, that is damaged due to Contractor's negligence shall be repaired or replaced, as determined by Engineer, at no additional cost to Owner.
- D. Materials not indicated or specified to be relocated or returned to Owner shall become property of Contractor and be disposed of as specified in "Waste Materials," this Part.
- E. Perform demolition work to protect existing facilities, structures, and property which are to remain, against damage from operations, falling debris, or other cause.
- F. Make provisions for temporarily accommodating flows in existing facilities that are to be relocated or disturbed.
- G. Take precautions to guard against movement or settlement, and provide shoring and bracing as necessary.
- H. If at any time safety of existing structure to remain is endangered, cease operations, notify Engineer, and do not resume operations prior to approval.
- I. Remove concrete by jack hammering, sawing, core drilling, or other approved method.
- J. Remove existing pavement by jack hammering, sawing, scarifying, or other approved methods except as follows:
  - 1. Existing asphaltic or Portland cement concrete pavement shall be sawed at point where pavement indicated to remain ends and pavement indicated to be removed begins.
  - 2. Existing Portland cement concrete pavement shall be removed back to the nearest joint unless otherwise indicated or approved by Engineer.

3.02 SITE PREPARATION:

- A. Silt Fence:
  - 1. Install silt fence as indicated and as follows:
    - a. On the downslope side(s) of all disturbed areas.
    - b. On the downslope side(s) of all stockpile areas.
  - 2. Inspection:
    - a. Daily in areas of active construction or equipment operation.
    - b. Weekly in areas with no construction or equipment operation.
    - c. Within 24 hours of each 0.5 inch or greater rainfall event.
    - d. Complete inspection reports after each inspection and submit to Engineer within two working days.
  - 3. Maintenance:
    - a. Remove sediment from behind silt fence when it reaches one-third the height of fence. Place removed sediment in topsoil stockpile areas.
    - b. Any silt fence damaged so it cannot perform its intended function shall be replaced as indicated or as directed by Engineer.
    - c. Remove silt fence after area has been surfaced or seeded and has been accepted by Engineer.
- B. Construction Access:
  - 1. Immediately remove by shoveling and/or sweeping all sediment tracked from the construction area onto Site access roads. Place sediment in stockpile areas.
- C. Clearing and Grubbing:
  - 1. Perform only in areas where earthwork or other construction operations are to be performed.
  - 2. Protect tops, trunks, and roots of existing trees which are to remain on Site.
  - 3. Clear areas and dispose of other trees, brush, and vegetation before starting construction.
  - 4. Remove tree stumps and roots larger than 3 inches in diameter and backfill resulting excavations with compacted, suitable material.

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5. Dispose of debris from clearing and grubbing and demolition at a location off the Site, as arranged for by Contractor, at no additional cost to Owner. No burning will be allowed at the project site.
  6. Contractor may claim and salvage any timber or other debris which may be considered of value, but shall not delay in any manner either this Contract or other work with salvaging operations.
- D. Stripping:
1. Remove topsoil from areas within limits of excavation, trenching and borrow, and areas designated to receive embankment and compacted fill as follows:
  2. Scrape areas clean of all brush, grass, weeds, roots, and other material.
  3. Strip to depth of approximately 6 inches or to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required to segregate topsoil, or as directed by Engineer.
  4. Stockpile topsoil in areas where it will not interfere with construction operations or existing facilities. Stockpiled topsoil shall be reasonably free of subsoil, debris, and stones larger than 2 inches in diameter.
  5. Remove waste from the Site.

3.03 EXCAVATION AND TRENCHING:

- A. Sheeting and Bracing:
1. Design, furnish, place, maintain, and subsequently remove, to extent required, a system of temporary supports for cut and cover, open cut, or trench excavations, including bracing, dewatering, and associated items to support sides and ends of excavations where excavation slopes might endanger in-place or proposed improvements, extend beyond construction right-of-ways, or as otherwise specified or indicated.
  2. Provide all materials on Site prior to start of excavation in each section, and make such adjustments as are required to meet unexpected conditions.
  3. Space and arrange sheeting and bracing as required to exclude adjacent material and according to stability of excavation slopes.
  4. Assess existing conditions including adjacent property and possible effects of proposed temporary works and construction methods; and select and design such support systems, methods, and details as will assure safety to the public, adjacent property, and the completed Work.
  5. Modify or relocate underground facilities, at no additional cost to Owner, if existing underground facilities interfere with Contractor's proposed method of support.
  6. Use caution in areas of underground facilities, which shall be exposed by hand or other excavation methods acceptable to Owner.
  7. Perform sheeting, shoring, and bracing in accordance with safety and protection requirements of the Contract Documents.
  8. Provide sheeting, shoring, and bracing for trench excavation in subgrade of excavation when required to prevent movement of the main excavation support system.
  9. Provide shoring, sheeting, and bracing as indicated or as needed to meet the following requirements:
    - a. Prevent undermining and damage to all structures, buildings, underground facilities, pavements, and slabs.
    - b. Perform excavations with vertical banks where necessary for construction activities or as indicated, and also within all limits of excavation noted on Drawings.
    - c. Design excavation support system and components to support lateral earth pressures, unrelieved hydrostatic pressures, utility loads, traffic and construction

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

loads, and building and other surcharge loads to allow safe and expeditious construction of permanent structures without movement or settlement of the ground, and to prevent damage to or movement of adjacent buildings, structures, underground facilities, and other improvements. Design shall account for staged removal of bracing to suit the sequence of concrete placement for permanent structures and backfill.

- d. Except as otherwise specified herein, shoring and sheeting materials may be extracted and reused at Contractor's option; however, Contractor shall remove and replace any existing structure or underground facility damaged during shoring and sheeting. Remove sheeting and bracing as backfill progresses. Fill voids left after withdrawal with sand or other material approved by Engineer.
  - e. Where shoring and sheeting materials must be left in place in the completed Work to prevent settlements to or damage within adjacent structures or as directed by Engineer, backfill the excavation to 3 ft. below finished grade and remove the remaining exposed portion of shoring before completing backfill. If soldier piles and wood lagging are used for shoring, remove wood lagging to within 3 ft. of finished grade in incremental steps of approximately 6 inches as backfill is placed, or to Contractor's design if more stringent. Location of all shoring and sheeting left in-place shall be documented on Contractor-furnished construction record Drawings and provided to Engineer and Owner.
10. Contractor shall be solely responsible for proper design, installation, operation, maintenance, and any failure of any component of the system. Review by Engineer of Drawings and data submitted by Contractor shall not in any way be considered to relieve Contractor from full responsibility for errors therein or from the entire responsibility for complete and adequate design and performance of the sheeting and shoring system.
  11. Provision for Contingencies:
    - a. Performance of components of the support system shall be monitored for both vertical and horizontal movement daily.
    - b. Provide a contingency plan or alternative procedure for implementation, if system does not adequately perform.
    - c. Keep materials and equipment necessary to implement the contingency plan readily available.
  12. Damages:
    - a. Document all existing damage to adjacent facilities and submit information to Owner prior to performing any excavation. Documentation shall include a written description, diagrams, measurements, and appropriate photographs.
    - b. Repair all damage resulting from Contractor's excavation and remove and replace all undermined pavements with Owner-approved equal, either concrete or asphalt, at no expense to Owner.
- B. Blasting:
1. Blasting will not be permitted.
- C. Excavation for Structures:
1. Excavate area adequate to permit efficient erection and removal of forms.
  2. Trim to neat lines where details call for concrete to be deposited against earth.
  3. Excavate by hand in areas where space and access will not permit use of machines.
  4. Notify Engineer immediately when excavation has reached the depth indicated.
  5. Overexcavate and replace any localized zones of excessively wet, unstable, organic, yielding, or low bearing capacity materials as directed by Engineer. Restore bottom of excavation to proper elevation with compacted granular material in areas overexcavated.

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Correct at no additional cost to Owner when overexcavated without authority or to stabilize bottom rendered unsuitable through negligence or improper dewatering or other operations.

6. Any areas overexcavated for rock and soil removal or unsuitable material shall be restored to the proper subgrade elevation with compacted granular material per paragraph 3.04 of this Section.
  7. Top with 3 inch concrete seal coat where indicated and where required to provide satisfactory subgrade for structural base slabs.
- D. Trenching for Underground Utilities:
1. Side Walls:
    - a. Make vertical or sloped within specified trench width limitations below a plane 12 inches above top of pipe.
    - b. Make vertical or sloped as required for stability, above a plane 12 inches above top of pipe.
    - c. Excavate without undercutting sidewalls.
  2. Trench Depth:
    - a. Excavate to depth sufficient to provide the minimum bedding requirements for the pipe being placed.
    - b. Do not exceed that indicated where conditions of bottom are satisfactory.
    - c. Increase depth as necessary to remove unsuitable supporting materials.
    - d. Maintain a minimum of 3.0 ft. of soil cover above top of pipe.
    - e. Sixteen inch and larger diameter water lines shall be provided a minimum of 5 ft. of soil cover above top of pipe.
  3. Trench Bottom:
    - a. Protect and maintain when suitable natural materials are encountered.
    - b. Remove rock fragments and materials disturbed during excavation or raveled from trench walls.
    - c. Restore to proper subgrade with trench stabilization material or timber mat topped with trench stabilization material when overexcavated. Correct at no additional cost to Owner when trench is overexcavated without authority or to stabilize bottom rendered unsuitable through negligence or improper dewatering or other operations.
  4. Trench Width:
    - a. Excavate trench to a width which will permit satisfactory jointing of pipe and thorough tamping of bedding and backfill.
    - b. Do not exceed following trench widths:
      - (1) For single pipe installation, maintain trench widths below a plane 12 inches above top of pipe as follows:

<u>Nominal Pipe Size</u>	<u>Trench Width</u>	
	<u>Minimum</u>	<u>Maximum</u>
Less than 24 inches	Pipe od + 1 ft.	Pipe od + 2 ft.
24 inches to 60 inches	Pipe od + 2 ft.	Pipe od + 4 ft.
Larger than 60 inches	Pipe od + 3 ft.	Pipe od + 5 ft.

5. Fill and Embankment Areas: Perform trenching only after compacted fill or embankments have reached an elevation of not less than 1 ft. above top of pipe.
6. Limit maximum length of open trench to 100 ft. in advance and to 50 ft. behind pipe installation.
7. Test Pits:

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

- a. Excavate test pits sufficiently in advance of trenching to enable adequate planning of construction procedure.
  - b. Locate as follows:
    - (1) When unstable material is suspected that may require special protective measures.
    - (2) Where groundwater may require special handling methods.
    - (3) Where indicated or otherwise approved.
    - (4) Where interference or conflict with other utilities or structures could affect alignment of pipe.
  - c. To depth required to obtain information desired.
- E. Dewatering:
- 1. General:
    - a. Design and provide a dewatering system using accepted and professional methods of design and engineering consistent with the best current practice to eliminate water entering excavation under hydrostatic head from bottom and/or sides.
      - (1) Design system to prevent differential hydrostatic head because of rising water levels from adjoining or nearby bodies of water, proximity of excavation to phreatic groundwater level, or surface runoff, resulting in a "quick" or "boiling" condition.
      - (2) System shall not be dependent solely upon sumps and/or pumping water from within excavation where differential head would result in a "quick" condition, and continue to worsen the excavation's stability.
    - b. Provide dewatering system of a sufficient size and capacity as required to control ground and surface water flow into excavation and to allow all Work to be installed in a dry condition, including the obtaining of a licensed well-driller, where required.
    - c. Control, by acceptable means, all water regardless of source and be fully responsible for disposal of water.
    - d. Confine all discharge piping and/or ditches to available easement or to additional easement obtained by Contractor. Provide all necessary means for disposal of water, including the obtaining of all necessary permits and of additional easement at no additional cost to Owner.
    - e. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures.
      - (1) Where necessary to these purposes, lower water level in advance of excavation, using wells, wellpoints, jet eductors, or similar positive methods.
      - (2) Water level as measured in piezometers shall be maintained a minimum of 3 ft. (1 m) below the prevailing excavation level.
    - f. Provide means for positive dewatering of all water sources prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.
    - g. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.
    - h. Install wells and/or wellpoints, if required, with suitable screens and filters, so that continuous pumping of fines does not occur. Arrange the discharge to facilitate collection of samples by Owner or Resident Project Representative. During normal pumping, and upon development of well(s), levels of fine sand or silt in discharge water shall not exceed 5 ppm. Install a sand tester on discharge of each pump during testing to verify that levels are not exceeded.

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- i. Install, operate, and maintain dewatering system required to control surface and/or groundwater.
  - j. Control grading around excavations to prevent surface water from flowing into excavation areas.
  - k. Drain or pump as required to continuously maintain all excavations and trenches free of water or mud from any source, and discharge to approved drains or drainage channels. Commence when water first appears and continue until Work is complete to the extent that no damage will result from hydrostatic pressure, flotation, buoyancy, or other causes.
  - l. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.
2. Damages:
- a. Repair without additional cost to Owner any damage to Work in-place, other contractors' equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, and the excavation, including damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor's negligence, inadequate or improper design and operation of dewatering system, and any mechanical or electrical failure of dewatering system.
  - b. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to Owner.
3. Maintaining Excavation in Dewatered Condition:
- a. Dewatering shall be a continuous operation. Interruptions due to power outages, or any other reason shall not be permitted.
  - b. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation, or other hydrostatic pressure imbalance.
  - c. Provide standby equipment on Site, installed, wired, and available, for immediate operation if required to maintain dewatering on a continuous basis in event any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.
4. System Removal:
- a. Remove all dewatering equipment from Site, including related temporary electrical service.
  - b. All wells shall be removed or cut off a minimum of 3 ft. below the final ground surface, capped, and abandoned in accordance with regulations by agencies having jurisdiction.
  - c. Removal work required under this Paragraph does not include any Site cleanup work as required elsewhere in these Specifications.
- F. Waste Materials:
1. Remove unsuitable materials from Work area as excavated.
  2. Material shall become property of Contractor and shall be disposed of off-site at locations arranged for by Contractor.

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

3.04 EARTHWORK:

A. Subgrades:

1. General:

- a. Excavate or backfill as required to construct subgrades to elevations and grades indicated.
- b. Remove all unsuitable material and replace with acceptable fill material and perform all wetting, drying, shaping, and compacting required to prepare subgrade.
- c. Proofrolling: Exposed area to receive fill, backfill, or embankment shall be proofrolled to detect localized zones of excessively wet, unstable, organic, or low bearing capacity materials as follows:
  - (1) Proofroll as a single-pass operation with conventional compaction equipment during subgrade preparation and prior to placement of fill, and as a spot check process without the need for complete coverage per unit area of tire. Soft spots shall be overexcavated, backfilled, and compacted with suitable material.
  - (2) Proofroll within limits of proposed construction of footings, slabs, mats, or pavement and to extent of 10 ft. beyond proposed exterior walls and stated limits, or as otherwise noted. Proofroll with loaded dump truck, loaded pan scrapper, 15 ton light class pneumatic tired roller compactor, or equivalent. Ground contact pressure of 80 psi and average speed of 5 miles per hour shall be maintained and continue until extent of soft spots is determined with not less than one pass per unit area of tire. Soft spots shall be overexcavated, backfilled, and compacted with suitable material.

2. Subgrade for Fills and Embankments: Roughen by discing or scarifying and wet or dry top 6 inches as required to bond with fill or embankment.

3. Subgrade for Roadways, Drives, Parking Areas:

- a. Extend subgrade the full width of pavement or base course, plus 1 ft. in each direction.
- b. Cohesive Soil Subgrades: Compact the top 6 inches of subgrade for traffic areas in embankment or excavation to a minimum of 95% of maximum dry density within the moisture content range from 3% below optimum to 3% above optimum. Optimum moisture and maximum dry density shall be determined by ASTM D698.
- c. Cohesionless Soil Subgrades: Compact the top 6 inches of subgrade for traffic areas and railroads in embankment or excavation to not less than 80% of relative dry density as determined by ASTM Methods D4253 and D4254.

4. Subgrades for Concrete Slabs on Grade, Mats, and Footings:

- a. Compact cohesive soil subgrades to a minimum of 95% of maximum dry density within the moisture content range from 3% below optimum to 3% above optimum. Optimum moisture and maximum dry density shall be determined by ASTM D698.
- b. Where subgrade consists of cohesionless granular materials, compact to not less than 80% relative density as determined by ASTM D4253 and D4254.

B. Embankments and Fills:

1. Construct embankments to contours and elevations indicated, using suitable approved material from excavations and borrow areas:
  - a. Place fill material in maximum 8 inch loose lifts.
  - b. Place embankment only on subgrades approved by Engineer.
  - c. Do not place snow, ice, or frozen earth in fill; do not place fill on a frozen surface.

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2. Obtain compaction by the controlled movement of compaction equipment approved by Engineer during placing and grading of layers and to minimum density specified for indicated locations.
  3. Except as indicated or specified otherwise, compact cohesive soils to a minimum of 95% of maximum dry density within the moisture content range from 3% below optimum to 3% above optimum. Optimum moisture and maximum dry density shall be as determined by ASTM D698.
  4. In areas of fill supporting structures or under paved areas, compact cohesive soils to a minimum of 95% of maximum dry density within the moisture content range from 3% below optimum to 3% above optimum. Optimum moisture and maximum dry density shall be as determined by ASTM D698.
  5. Except as indicated or specified otherwise, compact cohesionless soils to not less than 80% relative density as determined by ASTM Method D4253 and D4254.
- C. Pipe Embedment:
1. Pipe bedding shall be as indicated, using granular material.
  2. Place granular embedment as follows:
    - a. With level bottom layer at proper grade to receive and uniformly support pipe barrel throughout its length.
    - b. Form shallow depression under each joint to facilitate jointing.
    - c. Add second layer simultaneously to both sides of pipe with care to avoid displacement.
    - d. Complete promptly after completion of jointing operations.
    - e. Substitute for any part of earth backfill to within 2 ft. of final grade at Contractor's option.
  3. Compact granular embedment as follows:
    - a. In loose lifts not exceeding 12 inches in depth.
    - b. Rod, spade, or use pneumatic or vibratory equipment:
      - (1) As required to obtain not less than 75% relative density as determined by ASTM Method D4253 and D4254.
      - (2) Throughout depth of embedment.
    - c. Compaction using flooding or water spraying techniques will not be allowed.
  4. Earth pipe embedment shall be as indicated and shall be used at impervious trench checks. Shape trench bottom to fit pipe and backfill throughout depth of trench with impervious materials. Compact to minimum of 95% of maximum dry density within the moisture content range from 3% below optimum to 3% above optimum. Optimum moisture and maximum dry density shall be determined by ASTM D698.
- D. Backfilling:
1. Backfill for structures and trenches shall be as specified in "Embankments and Fills," this Section, with the following additional provisions:
  2. Structures:
    - a. Backfill only after concrete has attained 75% design strength.
    - b. Backfill adjacent to structures only after a sufficient portion of structure has been built to resist imposed load.
    - c. Remove all debris from excavation prior to placement of material.
    - d. Place backfill in level loose lifts of thickness within compacting ability of equipment used but not to exceed 8 inches in thickness.
    - e. Perform backfilling simultaneously on all sides of structures.

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- f. Exercise extreme care in use of heavy equipment in areas adjacent to structures. Equipment operated within 10 ft. of any wall shall not exceed 20,000 lbs. gross weight.
  - g. Rock fill should not be placed within 4 ft. of building and pavement subgrade elevations. Rock fills should also not be incorporated into fill sections in areas where utility trench or other excavations will be performed in the future.
3. Trenches:
- a. Backfill for trenches shall be as specified for structures and as follows:
    - (1) Complete promptly upon completion of pipe embedment and approval to proceed.
    - (2) Use hand methods to a plane 12 inches above top of pipe.
    - (3) Mechanical methods shall be acceptable where hand backfill is not required.
    - (4) Backfill in lifts of thickness within compacting ability of equipment used, but not greater than 8 inches.
    - (5) Until compacted depth over conduit exceeds 3 ft. do not drop fill material over 5 ft. Distance may then be increased 2 ft. for each additional ft. of cover.
4. Controlled Low-Strength Material (CLSM):
- a. Place CLSM (flowable fill) by means of chute, drop pipe, pump, bucket, or other method approved by Engineer to maintain consistency, flowability, and strength of in-place final product. Fill all voids and place to indicated grades or minimum elevations noted without use of a vibrator.
  - b. Open ends of area to be backfilled shall be plugged or built-up with a temporary bulkhead arrangement to prevent loss of CLSM during placement or during curing.
  - c. Prevent movement of any adjacent structure or pipe conduit:
    - (1) Anchor pipe or structure to prevent uplift or movement prior to placement of CLSM.
    - (2) Prevent intrusion of CLSM into interior sections of structure or pipe.
    - (3) If any such movement or intrusion occurs, affected structures or pipe shall be cleaned and may require excavation, removal, and replacement of CLSM to intended final fill elevation.
  - d. CLSM is intended for placement within a hole that is dry or maintained with a positive dewatering operation. If it is necessary to place CLSM under water, method for placement and mix design shall be submitted to Engineer for approval at least 10 working days prior to any intended pours.
  - e. Monitor surface elevation of placed CLSM and document any shrinkage or settlement of initial placement volume. Provide information of shrinkage and/or settlement of initial lift to Engineer prior to placement of any additional layers or completion of CLSM placement to final indicated elevation.
  - f. CSLM shall not be covered with soil or other imposed loading until a minimum compressive strength of 30 psi is attained or until a minimum of 12 hours' cure time has elapsed. Minimum strengths shall be demonstrated by laboratory test results or if permitted by Engineer, by failure to deform or crush the fill with an equivalent 30 psi applied loading in the field.
  - g. Protect CSLM from freezing while curing with insulated blankets or other approved methods.
  - h. Where air may become trapped under slabs due to grade beams or other structural components, holes shall be drilled at locations indicated, or as directed by Engineer to allow for uniform placement of CLSM entirely within the void region. Plugs

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

shall be installed to confine CLSM, as needed. It is not intended that raising or leveling of any slabs or structural elements shall occur from placement methods.

E. Site Grading:

1. Excavate, fill, compact fill, and rough grade to bring Project area outside buildings to subgrades as follows:
  - a. For surfaced areas, to underside of respective surfacing or base course.
  - b. For areas to receive topsoil, to a minimum of 4 inches below finished grade.
  - c. When rock is encountered in grading areas outside buildings, overexcavate to depth specified and backfill to grade with compacted fill:
    - (1) Under surfaced areas, to 6 inches below top of respective subgrades for such areas.
    - (2) Under lawn and planted areas, to 24 inches below finished grade, except that boulder or protruding rock outcrop, if so indicated, shall be left undisturbed.
2. Grading:
  - a. Grade and compact all areas within Project area, including excavated and filled sections and adjacent transition areas, reasonably smooth, and free from irregular surface changes.
  - b. Degree of finish for rough grading shall be that ordinarily obtained from blade grader or scraper operations except as otherwise specified with due allowance for topsoil.
  - c. Finished grades shall generally be not more than 0.1 ft. above or below those indicated.
  - d. Finish all ditches, swales, and gutters to drain readily.
  - e. Unless otherwise indicated, slope the subgrade evenly to provide drainage away from all structures in all directions at a grade not less than 1/4 inch per ft. for a minimum distance of 10 ft.
  - f. Provide roundings at top and bottom of banks and at other breaks in grade.

3.05 TOPSOILING:

- A. Material: Use the most suitable material obtained from stripping operations and borrow when required.
  1. Placement:
    - a. Clear areas free of vegetation, rock, and other materials which would interfere with grading and tillage operations.
    - b. Bond topsoil to subgrade by scarifying subgrade to a depth of 2 inches.
    - c. Spread topsoil to a minimum depth of 4 inches where grading operations have left less than 4 inches of topsoil in place.
    - d. Grade topsoil to bring areas to grades as indicated, to ensure that all surfaces are left in an even and properly compacted condition, and to prevent ponding of water in depressions.
  2. Cleanup:
    - a. Clean surface free of all stones or other objects larger than 2 inches in least dimension, all roots, brush, wire, grading stakes, and other objectionable materials.
    - b. Keep paved areas clean and promptly remove rock and dirt dropped upon surfacing.

3.06 RIPRAP:

- A. Foundation Preparation:

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

1. Uniformly trim and dress areas on which filter blankets are placed, conforming to cross sections indicated within an allowable tolerance of  $\pm 1$  inch from indicated slope lines and grades of subgrade.
2. Fill areas below tolerance limit with suitable material and compact.
3. Do not place riprap until the base has been accepted by Engineer.
- B. Placement of Filter Blanket Materials:
  1. Place on slopes within limits as indicated.
  2. Spread material uniformly on prepared base, in a neat and satisfactory manner to a thickness of 6 inches.
  3. Place and spread material by methods which will not segregate particle sizes within the filter.
  4. Any damage to surfaces of filter blanket foundation during placing of filter blanket material shall be repaired before proceeding with the Work.
  5. Compaction of filter blanket material will not be required, but it shall be finished to present a reasonably even surface free from mounds, depressions, or windrows.
- C. Install riprap in accordance with MoDOT Section 611.30 Rock Blanket.

3.07 MAINTENANCE:

- A. Protect newly graded and topsoiled areas from actions of the elements.
- B. Fill and repair settling, or erosion occurring prior to acceptance of the Work and reestablish grades to required elevations and slopes.
- C. Under provisions of the guarantee, correct any settlement of embankment, fill, or backfill and damages created thereby within one year after acceptance of the Work. Make repairs within 10 days after notification by Owner of settlement.

3.08 FIELD QUALITY CONTROL:

- A. Compaction:
  1. Owner will, through services of an independent laboratory, test all embankments, fills, and subgrades under this Contract to determine conformance with specified density relationships.
  2. The frequency of in-place compaction testing including density and moisture content will be as follows:
    - a. At least one test for every 1,000 yds.<sup>3</sup> of material placed in a mass fill.
    - b. At least one test for every 200 yds.<sup>3</sup> of fill placed in trenches or surrounding structures.
    - c. At least one test per 2,500 ft.<sup>2</sup> per lift of compacted soil liner or fill in roadbed.
    - d. At least one test for every 2,500 ft.<sup>2</sup> of subgrade for fill or soil liner.
    - e. At least one test for every 100 ft. of roadway for road subgrades and crushed rock base course.
    - f. At least one test for every 500 ft.<sup>2</sup> per lift in structural fill or on subgrades for foundations.
    - g. At least one test for every shift of compaction operations on a mass fill.
  3. At least one test when Engineer suspects quality of moisture control or effectiveness of compaction. Remove or scarify fill failing to meet required densities and recompact as necessary to achieve specified results.
  4. Removal of in-place material and replacement with approved new material will be required if scarifying and recompaction do not produce the required densities.
  5. Perform at least one classification test (ASTM D2487) and one moisture-density test (ASTM D698) on soil used in fill or backfill operations during construction.

SECTION 31 20 50 – SITE PREPARATION AND EARTHWORK: continued

- a. Each sample shall be taken from trenches or other excavations as directed by Engineer and should be generally representative of distinguishably differing materials encountered and used for backfill or fill.
  - b. Perform one set of tests at the beginning of excavation and one additional set of tests when material properties vary from the material initially tested.
  - c. Additional tests shall be performed when directed by Engineer.
- B. Controlled Low-Strength Material (CLSM):
1. Determine unconfined compressive strength using cylinders of CLSM sampled, handled, cured, and tested in accordance with ASTM D4832. Perform a minimum of one set of four cylinders for every 150 yds.<sup>3</sup> of CLSM placed but not less than one set for each day's placement, unless otherwise directed by Engineer.
  2. Determine bearing strength, if required by Engineer, using penetration testing in accordance with ASTM C403.
  3. Test flow of CLSM, if required by Engineer, in accordance with ASTM C939.
- C. Subgrades:
1. Engineer will inspect all subgrades to determine conformance with indicated lines and grades.
  2. Subgrades for roadways, drives, parking areas, and railroads shall have a maximum deviation of not more than 1/2 inch in any 10 ft. when tested with a 10 ft. straightedge applied parallel with and at right angles to centerlines of subgrade areas. Actual grade shall not be more than 0.1 ft. from indicated grade.

END OF SECTION 31 20 50

## DIVISION 32 – SEEDING

### SECTION 32 92 00 – SEEDING

#### PART 1 - GENERAL

##### 1.01 SUMMARY:

- A. This Section includes seedbed preparation, seeding, mulching, and fertilizing of areas indicated and/or disturbed by Contractor's construction activities.
- B. Maintenance of seeded areas.
- C. Related Work Specified Elsewhere:
  - 1. Section 31 20 00 – Site Preparation and Earthwork

##### 1.02 REFERENCE STANDARDS:

- A. Applicable Standards:
  - 1. American Society for Testing and Materials (ASTM): Equivalent AASHTO standards may be substituted as approved.
    - a. D977 - Emulsified Asphalt.
  - 2. American Public Works Association – Kansas City Metropolitan Chapter (APWA):
    - a. APWA Division II Section 2150 – Seeding, Sodding and Overseeding (APWA-KCMO 2150)
    - b. APWA Division II Section 2400 – Seeding, Sodding and Overseeding (APWA-KCMO 2400)

##### 1.03 SUBMITTALS:

- A. Certificates: Includes, but not limited to, the following:
  - 1. Seed shall be accompanied by certificate from vendor that seed meets requirements of these Specifications. Original hardcopy shall be submitted to Engineer or Owner for approval.
  - 2. Fertilizer shall be accompanied by certificate from vendor that fertilizer meets requirements of these Specifications. Original hardcopy shall be submitted to Engineer or Owner for approval.

#### PART 2 - PRODUCTS

##### 2.01 FERTILIZER:

- A. Fertilizer shall be an inorganic 12-12-12, 13-13-13 or other approved substitute commercial grade.
  - 1. Uniform in composition.
  - 2. Shall be free flowing and suitable for application with approved equipment.
  - 3. Shall be spread by mechanical means.
- B. Deliver to Site in labeled bags or containers.
- C. Shall meet APWA-KCMO 2400.

##### 2.02 SEED:

- A. Seed shall conform to all applicable laws of the State of Missouri.
- B. Seed shall be labeled according to the U.S. Department of Agriculture Federal Seed Act and shall be furnished in containers with tags showing seed mixture, purity, germination, weed content, name of seller, and date on which seed was tested.
  - 1. Seed mixture shall be Seeding – Mix #2 as defined in APWA KCMO 2400

SECTION 32 92 00 – SEEDING : continued

2. Seed mixture shall be applied at a minimum rate of 10 pounds per 1000 square feet in accordance with APWA-KCMO 2400.
  3. Moldy seed or seed that has been damaged in storage shall not be used.
- 2.03 EROSION CONTROL BLANKET
- A. Erosion control blanket shall meet the requirements in KCMO-APWA-2150.
- 2.04 MULCH:
- A. Vegetative Mulch: Mulch shall be straw from stalks of wheat, rye, or oats and shall be free of noxious and undesirable seed and material. Hay shall not be used as a mulching material. Mulch shall be preferably from the previous year's crop and shall be partially decomposed.
  - B. Wood Cellulose Fiber:
    1. Fiber shall be produced from nonrecycled wood such as wood chips or similar wood materials and shall be of such character that the fiber will disperse into a uniform slurry when mixed with water. Fiber shall not be produced from sawdust, paper, cardboard, or other recycled materials.
    2. Mulch shall not contain germination or growth-inhibiting ingredients.
    3. Mulch shall be dyed an appropriate color to aid in visual inspection.
    4. Mulch material shall be easily and evenly dispersed when agitated in water.
    5. Supply in packages of not more than 100 pounds gross weight, and be marked by the manufacturer to show the air dry weight content of the wood cellulose fiber.
    6. Mulch shall not be water-soluble and shall comply with the following properties:
      - a. Moisture content: 15% maximum.
      - b. Organic matter: Wood fiber (oven-dried basis), 90% maximum.
      - c. pH: 4.3 to 8.5.
      - d. Water holding capacity (grams of water/100 grams fiber), minimum: 1,000.
    7. Submit wood cellulose fiber material and application rates for approval by Engineer or Owner.

PART 3 - EXECUTION

- 3.01 SEEDBED PREPARATION:
- A. Dispose of any growth, rocks, or other obstructions which might interfere with tilling, seeding, or later maintenance operations.
  - B. Thoroughly loosen and pulverize topsoil to a depth of at least 3 inches. Minimum depth of topsoil at seeded areas shall be 4 inches.
  - C. Maintain tilled areas until seeded and mulched to provide a smooth area with no gullies or depressions.
- 3.02 APPLICATION - FERTILIZER:
- A. Apply fertilizer at the rate in accordance with APWA-KCMO 2400 to properly prepared seedbeds.
  - B. Incorporate fertilizer into the soil to a depth of at least 2 inches by disking, harrowing, or raking. Fertilizer may be applied hydraulically on slopes 2 horizontal to 1 vertical or steeper. If fertilizer is applied hydraulically to these slopes, incorporation into the soil will not be required.
- 3.03 APPLICATION - SEED:
- A. All seed application shall be in accordance to APWA-KCMO 2400.

SECTION 32 92 00 – SEEDING : continued

- B. Dry Seeding: Accomplish sowing by use of approved equipment, having drills no more than 4 inches apart.
  - 1. Drill seed to an average depth of 1/2 inch.
  - 2. Overlap successive seed strips to provide uniform coverage. Repeat where skipped areas appear after a show of green.
  - 3. Cover seed with soil to an average depth of 1/4 inch by raking or other approved methods.
- C. Hydraulic Seeding: Mix seed with water and constantly agitate. Do not add seed to water until immediately prior to application. Do not let seeds remain in tank for more than 30 minutes.
  - 1. On slopes flatter than 2 horizontal to 1 vertical, apply seed separately from fertilizer. Mechanically incorporate fertilizer into the soil prior to seeding activities. Cover seed with either hydraulic mulch or soil. If hydraulic mulching is not used, cover seed with soil to an average depth of 1/4 inch by raking or other approved methods.
  - 2. On slopes 2 horizontal to 1 vertical and steeper, seed and fertilizer may be applied in a single operation. Incorporation into the soil will not be required. Hydraulic mulching will be required.
- D. All seeding shall be performed during favorable weather conditions and only during normal and acceptable planting seasons when satisfactory growing conditions exist. The planting operations shall not be performed during times of extreme drought, when ground is frozen or during times of other unfavorable climatic conditions unless otherwise approved by Owner. The Contractor assumes full and complete responsibility for all such plantings and operations.

3.04 APPLICATION - MULCH:

- A. Apply mulch covering to all seeded areas within 24 hours after seeding. Mulch is not required on areas that are to be covered by an excelsior blanket or by an erosion-control fabric. Jute netting alone will not be considered an erosion-control fabric.
- B. Apply vegetative mulch at the rate of 1.5 tons per acre by means of a mechanical spreader or other approved methods.
- C. Apply wood-cellulose-fiber mulch hydraulically at the rate of 1000 pounds per acre.
  - 1. Mulch and seed may be applied in a single operation on slopes 2 to 1 or steeper.
  - 2. Apply mulch to achieve a uniform coverage of the soil surface.

3.05 APPLICATION - EROSION CONTROL:

- A. Install erosion-control fabric in accordance with APWA-KCMO 2150 on all slopes 2 to 1 or greater. Install erosion-control fabric immediately following seeding operations..

3.06 MAINTENANCE:

- A. Mow grass to a height of 2 inches whenever average height of grass exceeds 5 inches.
- B. Remove weeds by approved chemical treatment.
- C. Erect and maintain signs or barricades to exclude traffic from seeded areas.
- D. Seeded Areas: Perform maintenance for a period of three months after planting unless the desired cover is obtained in a shorter time and the shortening of the period of Contractor's responsibility is authorized.
  - 1. Water as required by good practice during the three-month maintenance period or until accepted by Engineer.
  - 2. Prior to acceptance, repair at Contractor's expense any portion of the seeded surface which becomes gullied or otherwise damaged or destroyed.
  - 3. To be acceptable, seeded areas shall have a good, uniform color and sturdy growth with no bare soil spots, over a minimum of 98% of the area seeded.

SECTION 32 92 00 – SEEDING : continued

3.07 MEASUREMENT AND PAYMENT:

- A. Time of Completion: Completion time for seeding shall not apply to provisions for liquidated damages with respect to Contract completion time. Payment for seeding will be withheld until such Work is accepted.

END OF SECTION 32 92 00

DIVISION 33 – UTILITIES

SECTION 33 01 10.59 – CLEANING, DISINFECTION, AND LEAKAGE TESTING

PART 1 - GENERAL

1.01 SUMMARY:

- A. The Work to be performed shall include all labor, materials and equipment necessary for the final cleaning, disinfection, and leakage testing for the composite elevated water storage tank (CET).
- B. Related Work Specified Elsewhere:
  - 1. Section 01020 – Summary of Work Section.
  - 2. Section 01340 – Submittals.
  - 3. Section 01520 – Temporary Facilities.
  - 4. Section 33 11 00 – Pressure Pipe.
  - 5. Section 33 12 16 – Utility Valves and Accessories.
  - 6. Section 33 16 11 – Composite Elevated Water Storage Tank.
  - 7. Section 33 16 96 – Reservoir Hydrodynamic Mixing System.

1.02 REFERENCES:

- A. The latest edition of the following documents and standards are part of this specification to the extent specified herein.
  - 1. American Water Works Association (AWWA):
    - a. AWWA C651 – Standards for Disinfecting Water Mains.
    - b. AWWA C652 – Disinfection of Water-Storage Facilities.
    - c. AWWA D100 – Welded Steel Tanks for Water Storage.
    - d. AWWA D102 – Coating Steel Water-Storage Tanks.
    - e. AWWA D107 – Composite Elevated Tanks for Water Storage.
  - 2. Missouri Department of Natural Resources (MDNR)
    - a. MDNR Minimum Design Standards for Missouri Community Water Systems.
  - 3. National Sanitation Foundation International (NSF):
    - a. NSF 61 - Standard for Drinking Water System Components.
    - b. NSF 372 – Drinking Water System Components – Lead Content.
  - 4. Occupational Safety and Health Administration (OSHA):
    - a. OSHA 29 CFR - Part 1926 Safety and Health Regulations for Construction.

1.03 FINAL LEAKAGE TEST:

- A. Following substantial completion, tank shall be filled with water and inspected for leaks. Any identified leaks shall be repaired by removal of defective welds and replacing with newly welded sections, welding shall be performed in accordance with project specifications. Repair work shall be performed in accordance with AWWA D107 Section 9.7.
- B. Leakage testing shall be conducted on each newly installed water storage tank in accordance with AWWA D107, or MODNR’s procedures for pressure testing of water mains.
- C. Clean all interior tank and piping surfaces to a “broom clean” condition.
- D. Tank leakage test may be performed after all welds have been completed inspected and approved.
- E. Owner will provide up to two fillings of water for testing in accordance with Section 01520 Temporary Facilities. Additional fillings, if required, will be at Contractor’s expense.

1.04 FINAL CLEANING AND DISINFECTION:

COMPOSITE ELEVATED WATER STORAGE TANKS: continued

- A. Interior coating shall be complete and cured in accordance with the coating manufacturer's recommendations prior to cleaning and disinfection.
- B. Following completion of all other work, including coating, tank bowl and associated piping shall be thoroughly cleaned and disinfected in accordance with AWWA C652 and requirements of MDNR. Where State and local requirements conflict with provisions of this section, State and local requirements shall govern.
- C. Prior to the start of disinfection work, tank manufacturer shall submit a detailed outline of the proposed procedures, coordination operations, and tank filling and flushing. All procedures must be acceptable to the Engineer.
- D. Water used in tank cleaning and disinfection shall be disposed of in manner acceptable to the Owner and appropriate pollution control agency. Water shall be dechlorinated by the tank manufacturer before discharging to any surface or storm sewer.
- E. All cleaning and disinfecting materials, equipment necessary for cleaning and disinfection, and labor shall be furnished by the tank manufacturer.
- F. Disinfect interior of tank, piping, and all other surfaces to which potable water may come in contact.
- G. Disinfection shall meet AWWA C652 Chlorination Method 2 and the appropriate state agency. AWWA C652 Chlorination Method 3 of Section 4.3 is not acceptable.
- H. Bacterial sampling and testing shall conform to AWWA C652, Section 5.1 and shall be performed by owner prior to placing the CET into service. Additionally, the initial testing shall require two consecutive negative samples in lieu of one negative sample. If two consecutive negative samples are not achieved the CET shall be disinfected again.

END OF SECTION 33 01 10.59

## SECTION 33 11 00 – PRESSURE PIPE

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes all pressure pipe, fittings, specials, and appurtenances.
- B. Related Work Specified Elsewhere:
  - 1. Section 09 90 00 - Protective Coatings.
  - 2. Section 33 16 11 – Elevated Composite Water Storage Tanks.
  - 3. Section 33 12 16 – Valves and Accessories.
  - 4. Section 33 31 50 – Pipe Installation.

#### 1.02 REFERENCE STANDARDS:

- A. Applicable Standards:
  - 1. American Association of State Highway and Transportation Officials (AASHTO).
  - 2. American Water Works Association (AWWA):
    - a. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
    - b. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
    - c. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
    - d. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
    - e. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
    - f. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water.
    - g. AWWA C153 - Ductile-Iron Compact Fittings.
    - h. AWWA C200 - Steel Water Pipe 6 Inches (150 mm) and Larger.
    - i. AWWA C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 Inch and Larger - Shop Applied.
    - j. AWWA C207 - Steel Pipe Flanges for Waterworks Service, Sizes 4 Inch Through 144 Inch (100 mm Through 3,600 mm).
    - k. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings.
    - l. AWWA C209 - Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.
    - m. AWWA C210 - Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
    - n. AWWA C213 - Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
    - o. AWWA C214 - Tape Coating Systems for Steel Water Pipe.
    - p. AWWA C215 - Extruded Polyolefin Coatings for Steel Pipe.
    - q. AWWA C218 - Liquid Coating Systems for the Exterior of Aboveground Steel Water Pipelines and Fittings.
    - r. AWWA C219 - Bolted, Sleeve-Type Couplings for Plain-End Pipe.
    - s. AWWA C606 - Grooved and Shouldered Joints.
    - t. AWWA M11 - Steel Pipe - A Guide for Design and Installation.
    - u. AWWA M41 - Ductile-Iron Pipe Fittings.
  - 3. American National Standards Institute (ANSI):
    - a. ANSI B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
    - b. ANSI B16.9 – Factory-Made Wrought Buttwelding Fittings
    - c. ANSI B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.
  - 4. American Society for Testing and Materials (ASTM):

SECTION 33 11 00 – PRESSURE PIPE: continued

- a. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.
  - b. ASTM A312 – Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
  - c. ASTM A403 – Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.
  - d. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
  - e. ASTM G62 - Standard Test Methods for Holiday Detection in Pipeline Coatings.
  5. NSF International (NSF):
    - a. NSF 61 – Drinking Water System Components - Health Effects.
    - b. NSF 372 – Drinking Water System Components – Lead Content.
  6. Society for Protective Coatings (SSPC):
    - a. SP1 - Solvent Cleaning.
    - b. SP3 - Power Tool Cleaning.
    - c. SP5 - White Metal Blast Cleaning.
    - d. SP7 - Brush-Off Blast Cleaning.
    - e. SP10 - Near-White Blast Cleaning.
  7. International Organization for Standardization:
    - a. 8179-1 – Ductile Iron Pipes, Fittings, Accessories, and Their Joints – External Zinc-Based Coating – Part 1: Metallic Zinc with Finishing Layer.
    - b. 8179-2 – Ductile Iron Pipes, Fittings, Accessories, and Their Joints – External Zinc-Based Coating – Part 2: Zinc-Rich Paint.
  8. KC Water Standards and Specifications For Water Main Extensions and Relocations.
- 1.03 SUBMITTALS:
- A. Submit as specified in Division 1.
  - B. Submit the following for acceptance prior to fabrication:
    1. Pipe and joint details.
    2. Special, fitting, and coupling details.
    3. Laying and installation schedule and drawings.
    4. Specifications, data sheets, and affidavits of compliance for protective shop coatings and linings.
    5. Manufacturer's design calculations including, but not limited to, wall thickness and deflection under specified live and dead loads.
    6. Concrete/DIP Adapter.
  - C. Certificates and Affidavits: Furnish the Following Prior to Shipment:
    1. Affidavit of compliance with applicable standard.
    2. Certificate or origin for all steel flanges. Flanges shall be manufactured in the U.S.A.
    3. Test certificates.
  - D. Submit certifications that welders are qualified, in accordance with ANSI B31.1, Paragraph 127.5 for shop and project site welding of pipe work
- 1.04 QUALITY ASSURANCE:
- A. Manufacturers shall be experienced in the design and manufacture of pipe, fittings, specials, or appurtenances for a minimum period of 5 years.

SECTION 33 11 00 – PRESSURE PIPE: continued

- B. All pipe manufactured to AWWA C200 series specifications shall be furnished by a manufacturer certified by the Steel Plate Fabricators Association (SPAA) for steel pipe fabrication.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Delivery, storage, and handling shall be as specified in Division 1.
- B. Manufacturers shall provide adequate strutting to protect pipe and fittings during handling, storage, hauling, and installation.

PART 2 - PRODUCTS

2.01 PIPE REQUIREMENTS:

- A. Furnish pipe of materials, joint types, and sizes as indicated or specified.
- B. Pipe shall be designed to withstand all stresses resulting from external loads and internal pressures listed in the following table plus applicable allowance for surge unless otherwise specified:

<u>Location</u>	<u>Material</u>	<u>Nominal Pipe Size (in)</u>	<u>Design Cover Depth (ft)</u>	<u>Live Load</u>	<u>Design Internal Working Pressure (psi)</u>	<u>Design Maximum Test Pressure (psi)</u>
Tank – Yard Piping	DIP	30	7.5	H-20	90	225
Tank – Yard Piping to 24" Transmission Main	DIP	24	9	H-20	90	225
Tank – Yard Piping to 16" Transmission Main	DIP	16	12	H-20	90	225
Tank Influent Piping in Valve Room	DIP	30	N/A	N/A	90	225*
Tank Effluent Piping in Valve Room	DIP	30	N/A	N/A	90	225*
Tank Influent Riser	SST	30	N/A	N/A	90	Tank HWL
Tank Effluent Riser	SST	30	N/A	N/A	90	Tank HWL
Tank Overflow	SST	Per tank manufacturer	N/A	N/A	90	Tank HWL

\*up to and including Butterfly Valves 002 and 003.

SECTION 33 11 00 – PRESSURE PIPE: continued

- C. Pipe Marking: All pipe and fittings shall be marked conforming to the applicable standard specification under which the pipe is manufactured and as otherwise specified.

2.02 DUCTILE-IRON PIPE:

A. Design and Manufacture of Pipe:

1. Ductile-iron pipe shall conform to AWWA C115, C150, and C151 except as otherwise specified.
2. Ductile-iron pipe shall conform to NSF 372, Reduction of Lead in Drinking Water Act.
3. With laying condition Type 4 for ductile iron for load requirements tabulated herein.
  - a. Use E' of 700 and bedding angle of 90°.
  - b. 3% deflection limit.
  - c. Add service allowance and standard casting tolerances of AWWA C150 and AWWA C151.
  - d. Select standard pressure class thickness next above total calculated thickness.

Dimensions: The minimum thickness as defined by thickness class for mechanical or push-on-type joint ductile-iron pipe shall be as follows:

<u>Location</u>	<u>Nominal Pipe Size</u>	<u>Minimum Thickness Class</u>
Yard Piping	30	54
Yard Piping	24	54
Tank Outlet to Transmission Main	16	54

1. Minimum thickness for ductile-iron pipe threaded for screw-on flanges shall be in accordance with AWWA C115.
2. Pipe with grooved barrel for any type of restrained joint shall have wall thickness increased to provide a minimum wall thickness conforming to AWWA C606.

B. Joints:

1. Mechanical and Push-On Type:
  - a. Provide mechanical or push-on-type joints for all buried pipe less than 12 inches in diameter unless otherwise specified or indicated. Provide push-on-type joints for sizes 12 inches in diameter and greater.
  - b. Joints shall conform to AWWA C111.
2. Flanged:
  - a. Provide flanged joints for all interior and exposed exterior pipe except where otherwise specified or indicated.
  - b. Flanges for pipe shall be ductile iron and conform to the applicable provisions of AWWA C110 and C115 and shall be drilled ANSI B16.1 Class 125 or 250 as required.
  - c. Pipe with victaulic-style couplings and rigid joints conforming to AWWA C606 may be substituted for Class 125 flanged pipe where indicated or approved by Engineer.
3. Sleeved or Coupled:

SECTION 33 11 00 – PRESSURE PIPE: continued

- a. Provide for sleeves or couplings where indicated.
- b. Furnish pipe ends suitable for receiving style of sleeve or coupling indicated or specified.
- c. Provide anchored couplings where restraint is required to withstand specified operating or hydrostatic test pressure and where indicated.
4. Restrained:
  - a. Furnish all fittings with restrained joints to offset internal pipeline forces, unless otherwise stated on drawings.
  - b. Provide restrained joints of following approved types:
    - (1) Restrained mechanical joint.
    - (2) Restrained push-on joint.
      - (a) 4-inch through 12-inch:
        - 1). American "Fast-Grip" Gasket.
        - 2). U.S. Pipe "MJ Field LOK".
        - 3). Engineer approved equal.
      - (b) 12 inch through 42-inch:
        - 1). American "Flex-Ring" Joint.
        - 2). U.S. Pipe "TR Flex".
        - 3). Engineer approved equal.
    - (3) Anchored couplings.
  - c. Mechanical joint retainer glands may be used where joint restraint is required unless indicated otherwise. Retainer glands shall be Megalug manufactured by EBAA Iron, Inc. or approved equal.
  - d. Field welding of joint restraint ring shall not be allowed on any ductile iron pipe.
- C. Fittings:
  1. Fittings shall conform to AWWA C110 or C153 and shall have a pressure rating of not less than that specified for pipe.
  2. Ductile iron pipe fittings shall conform NSF 372, Reduction of Lead in Drinking Water Act.
  3. Fittings for pipe with mechanical joint shall have mechanical joints.
  4. Fittings for pipe with push-on joints shall be mechanical joint or push-on-type joint.
  5. The following shall be provided with the piping as indicated or required and not tapped after pipe is supplied.
    - a. Include all specials, taps, plugs, flanges, and wall fittings as required.
    - b. Provide openings for air valve, drain, sampling, sensing, testing, and other connections with threaded bosses or flange outlets sized and located where indicated or required.
  6. All fittings shall be furnished with the manufacturer's recommended accessories required for proper installation.
  7. Provide openings for air valve, drain, sampling, sensing, testing, and other connections with threaded bosses or flange outlets sized and located where indicated.
  8. In addition to the requirements and required markings per AWWA C110 and C153 all fittings shall have distinctly cast on the outside of the body the identity of the conforming standard as follows:
    - a. ANSI/AWWA C110/A21.10 or
    - b. ANSI/AWWA C153/A21.4.

SECTION 33 11 00 – PRESSURE PIPE: continued

9. Provide tangent blow-off and drain assemblies where indicated. Outlet size shall be 150 6 inches and have flanged end.
- D. Lining:
  1. All pipe and fittings for water shall be cement-mortar lined in accordance with AWWA C104.
- E. Coating:
  1. All buried iron pipe and fittings shall be coated with manufacturer's standard bituminous paint coating.
  2. Flange faces shall be coated in accordance with AWWA C115.
  3. All pipe and fittings located in vaults, interior exposed, exterior exposed, and which may come in contact with process flow shall be shop coated with manufacturer's standard prime coat and have final field coat as specified in Section 09 90 00. Manufacturer shall verify prime coat is compatible with final field coat.
    - a. Pipe shall have labels and arrows for identification of pipe and direction of flow as specified in Section 09 90 00.
    - b. Prime and final field coat of pipe and fittings which may come in contact with process flow shall be certified to NSF 61.
  4. All buried ductile iron pipe and fittings shall be polyethylene encased as specified in accordance with Section 33 31 50.
  5. Factory Testing:
    - a. Testing shall be in accordance with all applicable AWWA Standards.
    - b. Provide certified test certificates for all tests.
  6. Exterior surfaces of all buried ductile iron pipe shall be coated with 200 g/m<sup>2</sup> of arc-sprayed zinc primer in compliance with ISO 8179-1. Zinc primer coating shall have topcoat with minimum mean dry film thickness of 3 mils, and local minimum thickness of 2 mils. All exterior surfaces of buried ductile iron fittings shall conform to ISO 8179-2.

2.03 STAINLESS STEEL PIPE:

- A. Materials: Steel grade shall be Type 304L stainless steel fabricated from material meeting the requirements of ASTM A312. Fabrication, inspection, testing, marking and certification of pipe and fittings shall be in accordance with ASTM A403. Backing flanges shall flat faced for water service and be drilled to ANSI B16.1 Class 125 or 250. Pipe surfaces, fittings, and welds shall be cleaned and passivated.
  1. Pipe, fittings and flange thickness shall be in accordance with the manufacturers certified pressure rating for the applicable service pressures. The design pressure rating shall be minimum 125 psi for piping located within closed or valve sections.
- B. Design of Pipe: Design shall conform to AWWA C200, AWWA M11, and as specified except that hydrostatic test of fittings after fabrication will not be required. Fittings shall be tested by dye penetrant method.
  1. Pipe shall be fabricated by die forming or rolling true to dimension and round within a tolerance of  $\pm 1/16$  inch.
  2. Size indicated or specified shall mean the nominal pipe size.
  3. The two edges of sheet shall be brought to line so as not to leave a shoulder on the inside of the pipe.
  4. Ends of pipe and fittings shall be perpendicular to the longitudinal axis. Pipes shall be straight within maximum of 1/8 inch deviation over 10 ft.

SECTION 33 11 00 – PRESSURE PIPE: continued

5. All pieces shall be clearly marked with gage and type of stainless steel.
6. Stainless steel pipe and fittings shall conform to NSF 372, Reduction of Lead in Drinking Water Act.
7. Minimum wall thickness shall meet and/or exceed maximum line working and test pressures and buckling failure encountered under full vacuum conditions.
  - a. Minimum pipe support locations are indicated on Drawings. Contractor shall support all pipe and fitting as required and/or as determined by manufacturer. Minimum wall thickness calculated shall meet and/or exceed any and all stresses and deflections imposed on pipe by support locations.
  - b. Basis of Design for wall thickness shall be submitted for information only. Bedding and trench type utilized shall be as indicated and specified.
  - c. Minimum wall thickness for all stainless steel piping shall be in accordance with the following table:

Pipe Location	Pipe Diameter (in)	Minimum Wall Thickness (in) <sup>1</sup>
Tank Influent/Effluent Riser	30	0.293

<sup>1</sup>For minimum yield point of 30,000 psi steel.

C. Joints:

1. Provide welded joints for all stainless steel pipe except where others are specified, indicated or required for connection to valves, instruments, skid divisions, etc.
2. Welded:
  - a. Provide pipe prepared for field welding single or double lap joints and field welded butt strap joint.
  - b. Lap welded joints to be prepared for fillet welding on outside or inside of the pipe at the Contractor's option.
    - (1) If Contractor welds inside of joints, Contractor shall use high-temp shrink wrap sleeve on exterior of pipe which is suitable for the temperatures produced by welding of interior joint to complete tape-wrap coating system.
    - (2) If Contractor backfills pipe prior to welding of joint, the Contractor, at a minimum, shall expose first five joints performed or as otherwise directed to verify performance of high-temp shrink wrap.
    - (3) Field welded joints which are pressure tested shall be visually inspected in accordance with ANSI/AWS D1.1 and be completed by a Certified Welding Inspector (CWI).
      - (a) Field welded joints which are not pressure tested shall be visually tested and tested by radiograph (RT) or ultrasonic (UT) in accordance with ANSI/AWS D1.1 and be completed by a Certified Welding Inspector (CWI).
    - (4) Field welding shall be in conformance with AWWA C206.
3. Flanged:
  - a. Provide certificate of origin for all flanges. All flanges shall be of USA origin.
  - b. Provide flanged joints for all interior and exposed exterior pipe except where otherwise specified or indicated.
  - c. Joints shall conform to AWWA C200 and AWWA C207.

SECTION 33 11 00 – PRESSURE PIPE: continued

- d. Flanges shall have a pressure rating not less than that required for pipe. Flanges shall be Class B, D, E, and/or F and be drilled ANSI B16.1 Class 125 or 250. Gaskets shall be NSF 61 product certified.
- e. Contractor shall coordinate all flange types and drilling patterns with adjacent pipe, valves, meters, fittings, etc.
- 4. Sleeved or Coupled:
  - a. Provide for sleeves or couplings where indicated.
  - b. Furnish pipe ends suitable for receiving style of sleeve or coupling indicated or specified.
  - c. Provide anchored couplings where restraint is required to withstand specified operating or hydrostatic test pressure and where indicated.
- D. Fittings and Specials:
  - 1. Fabricate from tested pipe to conform to AWWA C208 except where otherwise indicated or specified.
  - 2. Furnish welded-on tabs or angle ring on pipe wherever vertical pipe is to be supported by a riser clamp, to support the weight of the pipe.
  - 3. Design to withstand internal and external loading specified for pipeline in which located.
  - 4. Reinforce tees, laterals, and outlets conforming to applicable provisions of AWWA M11.
  - 5. Include wall fittings with approved anchor ring where indicated.
  - 6. The following shall be provided with the piping, as required, specified or indicated, and shall not be tapped after the pipe is supplied.
    - a. Include all adapters, outlets, taps, plugs, and other specials as required to complete installation as specified or indicated.
    - b. Provide openings for air valve, drain, sampling, sensing, testing, and other connections with threaded bosses or flanged outlets sized and located where indicated.
- E. Marking Pipe: In addition to the marking specified in paragraph "Pipe Marking," the following information shall be on all pipe, fittings, and specials:
  - 1. Design pressure in feet.
  - 2. Point of installation on all fittings and specials.
- F. Branch connections of piping 2.5-inches and smaller in diameter shall be connected by welded fittings. Branch connections 3-inches and larger in diameter shall be connected by pipe nipples or welded fittings with welded outlets and shall be welded to pipe shell and reinforced as needed to meet requirements.
- G. Pickling and Chemical Passivation: After all fabrication and welding is completed, the interior and exterior surfaces of all pipe, spools, fittings, and accessories shall be completely pickled and chemical passivated in accordance with ASTM A380 and A967.
  - 1. This requirement includes cleaning, descaling, as well as chemical passivation.
  - 2. Pipe, spools, fittings, and accessories shall have all external and internal surfaces pickled and chemically passivated by complete immersion for the stated period in a solution containing the standard concentrations of hydrofluoric and nitric acid with the balance of water, followed by a fresh water rinse bath. Where immersion is not practical, alternative methods may be used in accordance with ASTM A380.
  - 3. All pipe, spools, fittings, and accessories shall be free of surface iron upon completion of this process. All openings shall be capped after the pickling/passivating process to protect the inside of the spools from debris and dirt.

SECTION 33 11 00 – PRESSURE PIPE: continued

4. Additional passivation with citric acid in accordance with ASTM A967 is acceptable, provided this procedure follows ASTM A380 to remove all heat tint on the welds.
- H. Stainless steel pipe shall not be coated. Only bands, labels, and arrows as specified shall be furnished and installed for identification of piped fluid and direction.

2.04 SLEEVES AND COUPLINGS:

- A. Sleeves:
  1. AWWA C110 mechanical joint ductile-iron solid-sleeve type:
    - a. Pipe end space shall not exceed one-third of the sleeve laying length.
    - b. Interior, exposed, exterior, or buried service as indicated.
- B. Couplings:
  1. Acceptable manufacturers:
    - a. Bolted Sleeve Type Coupling - AWWA C219:
      - (1) Dresser Manufacturing, Style 38 or 138.
      - (2) Smith-Blair, Inc., Style 411.
      - (3) Engineer-approved equal.
  2. Center sleeve and components:
    - a. Center sleeve and compression gland-type end ring conforming to AWWA C219.
    - b. Split sleeve and sealing plate conforming to AWWA C227 and conforming to the performance standard of AWWA C219.
  3. Couplings to be supplied with two gaskets of a grade for the intended service.
  4. Split sleeve type couplings may be used where indicated and in lieu of sleeve type couplings.
  5. Center sleeve shall be without pipe stop.
  6. Couplings for joining stainless steel pipe shall be stainless steel.
  7. Couplings for joining direct buried, exposed exterior, vault or pit installations of iron, or PVC pipe shall be iron. Coupling shall be lined and coated as specified.
  8. Couplings for exposed interior iron may be steel or iron.
  9. Fastener bolts shall be ductile iron or stainless steel for iron couplings and high-strength, low-alloy steel for steel couplings. Bolts for direct buried coupling installations shall be stainless steel. Double nut shall be used on all buried sleeve couplings.
  10. Center sleeve and end rings shall be:
    - a. Ductile or malleable iron for iron couplings and end rings.
    - b. Steel for steel couplings.
    - c. Sealing plate for Split Sleeve couplings shall be stainless steel.
  11. Lining and Exterior Coating:
    - a. Use for all steel couplings intended for direct bury, exposed exterior, vault or pit installations.
    - b. Completely coat center sleeve and end rings.
    - c. At a minimum, lining shall include a two-part epoxy or nylon fuse-coated to a minimum 10 mils thickness or equivalent manufacturer's standard lining.
    - d. Line interior of all steel couplings intended for exposed-interior installations. Coat exterior with normal shop coating.
    - e. Linings shall be NSF 61 approved. Coating of couplings which may come in contact with process flow shall be NSF 61 approved.
  12. Installation:

SECTION 33 11 00 – PRESSURE PIPE: continued

- a. Couplings are to be installed per the manufacturer's published instructions and in compliance with the coupling type's respective AWWA standard (C219 or C227).
  - b. The coupling manufacturer's factory trained representative shall provide on-site training for Contractor's field personnel in the installation of sleeve coupling products.
- C. Flanged Coupling Adapters:
1. Flanged end and body to be one unit conforming to AWWA C219. Coupling end to be compression gland type with follower ring.
  2. Adapters for joining stainless steel shall be stainless steel.
  3. Adapters for joining direct buried, exposed exterior, vault or pit installations of iron pipe shall be iron.
  4. Adapters for joining exposed interior iron pipe may be steel or iron.
  5. Flanged end bolt circle, bolt size, and spacing shall conform to the applicable provisions of ANSI B16.1 and shall be drilled Class 125 for iron adapters. Flanges on steel adapters shall be AWWA C207, Class D, drilled ANSI B16.1 Class 125.
  6. Bolts and nuts shall be ductile iron for iron adapters and high-strength, low-alloy steel for steel adapters.
  7. Anchor studs shall not be used where joint restraint is required. Furnish adapters with tie rod harness assemblies where indicated.
  8. Lining and Exterior Coating for Steel Adapters:
    - a. Two-part epoxy or nylon fuse-coated to a minimum 0.25 mm (10 mils) thickness.
    - b. Completely coat adapter sleeve and end follower gland plus line interior for adapters intended for exposed exterior, vault or pit installations.
    - c. Line interior of all adapters intended for exposed interior installations. Coat exterior with normal shop coating.
- D. Anchored Couplings:
1. Furnish where joint restraint required to offset internal pipeline forces.
  2. Provide harnessed sleeve couplings and flanged coupling adapters with tie rod harnesses where indicated.
    - a. Harnesses shall consist of lugs or clamps welded or otherwise securely fastened to opposite joint elements with tie bolts between opposing lugs. "Dog ear" lugs shall be fabricated as indicated.
    - b. Design of harnesses for steel pipe shall conform with applicable provisions of AWWA M11.
    - c. Bolts with wedge teeth shall not be allowed to anchor tie rod.
  3. Provide expansion couplings with limit rods.
  4. Provide couplings for grooved and shouldered type joints conforming to AWWA C606.
    - a. Furnish grooved ends on ductile-iron end pipe.
    - b. Furnish shouldered ends on steel pipe.
  5. Mechanical joint retainer glands may be used where joint restraint is required for buried pipe. Retainer glands shall be Megalug manufactured by EBAA Iron, Inc.
  6. Provide split sleeve coupling restraint rings.
    - a. Restraint rings are to be supplied by the split sleeve coupling manufacturer and it is the manufacturer's responsibility to determine the size for the specific application.
    - b. Restraint rings are to be steel for ductile iron and steel pipe; and stainless steel for stainless steel pipe.

SECTION 33 11 00 – PRESSURE PIPE: continued

- c. Restraint rings are to be welded to the pipe surface by the pipe fabricator per the split sleeve coupling manufacturer's requirement. Field welding will not be allowed unless previously approved by the Engineer.
    7. Fastener bolts shall be ductile iron or stainless steel for iron coupling and high-strength low alloy steel for steel couplings. Bolts for direct buried coupling installations shall be stainless steel. Double nut shall be located on each end of tie rod.
    8. Location for use of anchored coupling in vaults or interior locations shall be submitted for review and approval. Contractor shall verify and coordinate to ensure adequate space is provided for tie rods and "dog ears" at each location.
    9. For information only, submit design calculations including, but not limited to, number of tie rods, thickness of tie rods, and "dog ear" size and thickness.
  - E. Insulated Couplings:
    1. Insulated couplings and/or flange isolation shall be located at all connections between dissimilar metals and where indicated.
    2. Couplings shall be insulated to prevent electrical conductivity where indicated.
    3. Insulated coupling design shall be otherwise conforming to the standard types and styles specified.
    4. Flange isolation kit shall include the following at a minimum:
      - a. Full length mylar sleeves with phenolic washers, double washer set as manufactured by Pipeline Seal and Insulator, Inc., or approved equal. One-piece sleeve may be used where required at connections with tapped bolts or as otherwise required.
      - b. Gaskets shall provide isolation and sealing as required. Coordinate flange type, drilling pattern, and flange dimensions with manufacturer to ensure proper gasket alignment.
  - F. Dismantling Couplings (Dismantling Joint):
    1. Consists of a mechanical joint fitting located between two pipe flanges with restraining rods across the mechanical joint section, providing a restrained system with integral space for removal of adjacent equipment. At minimum, dismantling joints shall be located as indicated on Drawings.
    2. Shall conform to AWWA C-219.
    3. Materials shall be steel and shall be coated and lined. Lining shall conform to NSF 61.
    4. When connected to DIP system, install insulating flange kit.
    5. Split Sleeve restraint flange coupling adapter may be used in lieu of a Dismantling Joint and shall conform to AWWA C27.
- 2.05 PRE-STRESSED CONCRETE CYLINDER PIPE
  - A. Materials and installation of any pre-stressed concrete cylinder pipe (PCCP) and concrete/DIP adapter(s) shall be in accordance to the most current version of KC Water Standards and Specifications For Water Main Extensions and Relocations.
  - B. The Contractor shall determine the depths and the Northing/Easting coordinates of the PCCP joints directly upstream and downstream of proposed location of the concrete/DIP adapter(s) prior to submitting show drawings to the Engineer.
  - C. The Contractor shall submit shop drawings of the concrete/DIP adapter(s) and final location of the concrete/DIP adapter(s) and will require Engineers approval prior to the Contractor's purchase and fabrication.

SECTION 33 11 00 – PRESSURE PIPE: continued

2.06 GASKETS AND BOLTING MATERIALS:

- A. Provide all gaskets, bolts, lubricant, and other accessories required to install pipe, fittings, and specials complete and ready for service. Gaskets and lubricants must be NSF 61 product certified.
- B. Gaskets for flanged joints shall conform to ANSI B16.21, American Cast Iron Pipe Company Toruseal 1/8-inch thick full-face gasket, or U.S. Pipe Company Flange-Type 1/8-inch thick ring gasket. Provide full-face gaskets for all pump and equipment connections.
- C. Gaskets for ductile iron flanged pipe and fittings 12 inch and smaller shall have "nominal" inside diameters, not the larger inside diameters per ANSI B16.21.
- D. Bolts for flanged joints shall conform to ASTM A307, Grade B. Nut and bolt heads shall be hexagonal.
- E. Gaskets and bolts for other than flanged joints shall be as otherwise specified for pipe and pipe joints.

2.07 EXPANSION JOINTS:

- A. Provide neoprene rubber expansion joints where indicated in Drawings.
- B. Materials of construction shall be compatible with the service temperatures and design pressure.
- C. Expansion joint rubber and components shall be NSF61 approved and be suitable for contact with potable water.
- D. Design:
  - 1. Inner tube shall be a seamless, leak-proof layer.
  - 2. Exterior cover shall be seamless elastomer layer compatible with outside environment.
  - 3. Reinforcement shall be minimum of six plies of high quality tire-cord reinforcement.
  - 4. Bolts and limit rods shall be stainless steel.
- E. Approved Manufacturers:
  - 1. General Rubber
  - 2. Engineer-approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Specified in Section 33 31 50.

3.02 FIELD TESTING:

- A. Specified in Section 33 31 50.

3.03 FIELD PROTECTIVE COATING:

- A. Specified in Section 09 90 00.

END OF SECTION 33 11 00.

## SECTION 33 12 16 - UTILITY VALVES AND ACCESSORIES

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes all valves and accessories.
- B. Related Work Specified Elsewhere:
  - 1. Division 01 – General.
  - 2. Protective Coatings: Section 09 90 00.
  - 3. Pressure Pipe: Section 33 11 00.
  - 4. Pipe Installation: Section 33 31 50.

#### 1.02 REFERENCES:

- A. Applicable Standards:
  - 1. American National Standards Institute (ANSI):
    - a. B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.
  - 2. American Society for Testing and Materials (ASTM):
    - a. A126 - Gray Iron Castings for Valves, Flanges and Pipe Fittings.
    - b. A276 - Stainless and Heat Resisting Steel Bars and Shapes.
    - c. A536 - Ductile Iron Castings.
    - d. A564 - Hot-Rolled and Cold-Finished Age-Hardening Stainless and Heat Resisting Steel Bars and Shapes.
  - 3. American Water Works Association (AWWA):
    - a. C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
    - b. C207 - Steel Pipe Flanges for Waterworks Service - Sizes 4 Inch Through 144 Inch (100 mm through 3600 mm).
    - c. C502 - Dry-Barrel Fire Hydrants.
    - d. C504 - Rubber-Seated Butterfly Valves.
    - e. C508 - Swing-Check Valves for Waterworks Service, 2 Inch (50 mm) through 24 Inch (600 mm) NPS.
    - f. C509 - Resilient-Seated Gate Valves for Water Supply Service.
    - g. C512 - Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
    - h. C515 – Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
    - i. C541 – Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates.
    - j. C550 - Protective Epoxy Interior Coatings for Valves and Hydrants.
    - k. C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
    - l. C800 - Underground Service Line Valves and Fittings.
  - 4. National Fire Protection Association (NFPA):
    - a. 1963 - Screw Threads and Gaskets, Fire Hose Connections.
  - 5. NSF International (NSF):
    - a. 61 – Drinking Water System Components – Health Effects.
    - b. 372 – Drinking Water System Components – Lead Content..

#### 1.03 SUBMITTALS:

- A. Submit as specified in Division 01.
- B. Include, but not limited to, the following:
  - 1. Catalog data or illustrations showing principal dimensions, parts, and materials.
  - 2. Spare parts list referenced to illustration of parts.

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3. Assembly and disassembly or repair instructions.
  4. Dimensions of the clearance required for butterfly valve discs.
  5. Manufacturer's interior and exterior coating system and information indicating compliance with final field coat.
  6. The number of turns to open and close the valve.
- C. Certificates and Affidavits:
1. Furnish prior to shipment. Include the following:
    - a. Test certificates.
    - b. Affidavit of compliance with applicable AWWA Standard, these specifications, and that tests specified have been performed and all test requirements met.
      - (1) Affidavit and test certificates shall be signed by manufacturer.

1.04 QUALITY ASSURANCE:

- A. Manufacturers shall be experienced in the design and manufacture of specific valves and accessories for a minimum period of 5 years.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Ship all valves with suitable end covers to prevent entrance of foreign material into valve body.
- B. Protect valve threads, flanges, stems, and operators from damage.
- C. Ship valves 2-1/2-inch and larger to the Project Site tagged with the valve number shown on the Drawings. Tag smaller valves to show the piping system in which it is to be used.

1.06 RESPONSIBILITY:

- A. Actuators, their controls, and accessories shall be the responsibility of the valve manufacturer for sizing, assembly, certification, field testing, and any adjustments necessary to operate the valve as specified.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Marking and identification of valves shall conform to AWWA C504 and AWWA C509.
- B. Valve services are grouped according to system pressure, pipe sizing and system materials. See the attached Valve Schedule Tables.

2.02 BUTTERFLY VALVES:

- A. Acceptable Manufacturers:
1. DeZurik, a unit of General Signal Corporation.
  2. Henry Pratt Company.
  3. No equal or substitute.
- B. Submittals: In addition to the information required in ARTICLE 1.03, the following shall be submitted:
1. Drawings indicating the position of the valve actuator and valve shaft.
  2. Drawings shall clearly indicate the country of origin of all cast gray iron and ductile iron valve components.
  3. Dimensions of the clearance required for butterfly valve discs.
- C. Design:
1. Conform to AWWA C504, AWWA C541, and as specified.

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2. Butterfly valves shall conform to NSF 372, Reduction of Lead in Drinking Water Act.
  3. Suitable for type of installation specified.
  4. Conform to criteria indicated in Design Data and Valve Schedule Tables.
  5. All valve end flanges shall conform to the following:
    - a. AWWA C207, Class D with ANSI B16.1 Class 125 drilling for steel body, Class 25A through Class 150B valves.
    - b. ANSI B16.1, Class 125 or 250 for ductile-iron body, Class 250 valves.
    - c. AWWA C207, Class E or Class F for steel body, Class 250 valves.
    - d. Contractor shall coordinate all flange drilling patterns.
  6. Mechanical or push-on type rubber-gasket joint ends shall conform to AWWA C111.
  7. Valves with a stop or lug cast integrally or mechanically secured to the body for the purpose of limiting disc travel will not be acceptable.
- D. Materials and Construction:
1. Body shall be of cast iron for Class 25A through Class 150B valves and ductile iron for Class 250 valves or fabricated steel.
  2. Shafts shall be ASTM A276 Type 304 or 316 stainless steel for Class 25A through Class 150B valves and ASTM 564 Type 630 stainless steel for Class 250 valves. Design velocity for Class 250 valves shall be 16 fps.
  3. Shaft and disc connection shall be made with stainless steel taper pins extending completely through the shaft and both sides of the valve disc, mechanically secured in place.
  4. Disc shall be cast or ductile iron for Class 25A through Class 150B valves and ductile iron for Class 250 valves.
  5. Seats shall be synthetic rubber, conform to AWWA C504, and be body mounted. Provide field replaceable and adjustable seat accessible from down pressure side of valve for sizes 30-inch and larger. Mating seat surface shall be Type 316 stainless steel or nickel-chromium alloy. Sprayed or plated mating surfaces are not acceptable. Seat retention hardware, if used, shall be 316 stainless steel.
  6. Shaft seals shall be designed for use of Chevron V-type. Packing shall be replaceable from the outside without removing the valve shaft or bearings. Pull-down packing is not acceptable.
  7. Sleeve-type bearings shall be corrosion resistant and self-lubricating. Bearings shall be Teflon lined with nonmetallic backing.
  8. Thrust Bearings: Valve shall be provided with one or more thrust bearing according to AWWA C504. Thrust bearings which are exposed to line liquid and consist of a metal bearing surface in contact with opposing metal bearing surface shall not be acceptable. Bearing shall be constructed of silicone-lubricated bronze or equal.
  9. Valves shall be furnished with manufacturer's recommended accessories required for proper installation.
  10. All other bolts, screws, and accessories used in construction of valve internal components shall be constructed of Type 304 or 316 stainless steel or other corrosion-resistant material.
- E. Actuators:
1. Manual Actuators:
    - a. Exposed operators shall be manufactured by Pratt, Model "MDT," or "DeZurik "M" Series.
    - b. All exposed-interior valves shall be provided with chainwheel or handwheel operator.
    - c. All valves shall open counterclockwise.
    - d. Provide indicators to show position of disc.

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- e. Provide handwheels with raised cast arrow and word OPEN on rim oriented to specified opening direction.
  - f. Actuators shall be grease-lubricated, totally-enclosed compound lever, traveling nut type to provide characterized closure. Actuator shall be self-locking at all variable opening positions.
  - g. Travel limiting stop nuts or collars installed in the actuating mechanisms shall be field adjustable and shall be locked in position by means of a removable roll pin, cotter pin, or other positive locking device. Clamps or setscrews are not acceptable.
  - h. Actuators shall be located in positions indicated or as otherwise determined when manufacturer's drawings are submitted.
  - i. Exposed, buried actuator case, supports, and connection to the valve shall be cast iron. Case shall be constructed to be water-tight.
  - j. Exposed, buried service actuator shafting, bolts, and fastening hardware shall be 316 stainless steel.
  - k. Hand chains shall be cadmium plated.
  - l. Hand chains shall be 3.0 ft. above the ground floor.
- F. Testing:
- 1. Furnish certified copies of results of performance, leakage, and hydrostatic tests performed in compliance with Section 5, AWWA C504.
  - 2. Leakage test shall be performed in both directions.
  - 3. Furnish affidavit of compliance with AWWA C504.
- G. Shop Coating:
- 1. Exterior Surfaces: Coat exterior surface of valves with manufacturers standard primer in compliance with AWWA C504 for installation noted. Minimum dry film thickness shall be 6 mils. Manufacturer shall verify shop coat is compatible with final field coat as specified in Section 09 90 00.
  - 2. Interior Surfaces: Apply interior epoxy enamel coating conforming to AWWA C550 and NSF-61 to exposed metal surfaces. Minimum dry film thickness for epoxy enamel coating system shall be 10 mils. Interior coating shall be free of holidays.
  - 3. Provide affidavit or certificate of compliance to AWWA C504, AWWA C550, and NSF-61.
- H. Valve Schedule: See attached Table 1.
- 2.03 ALTITUDE VALVE:
- I. Acceptable Manufacturers:
- 1. Cla-Val Company.
  - 2. GA Industries, Inc.
  - 3. Ross Valve Manufacturing Company.
  - 4. Singer Valve.
  - 5. Watts Automatic Control Valve Company.
- J. Operational Requirements:
- 1. Maximum controlled water level (Overflow Elevation) - El. 1160.00 ft.
  - 2. Minimum controlled water level - El. 1112.50 ft. (+/- 2.5 ft.).
  - 3. Centerline of altitude valve - El. 972.50 ft.
  - 4. Valve shall close at a water level 6 inches below maximum controlled water level.
- K. Materials of Construction:
- 1. Body shall be of ASTM A536 ductile iron.
  - 2. Stem, nuts, and spring shall be ASTM A276 Type 304 or 316 stainless steel.

SECTION 33 12 16 - UTILITY VALVES AND ACCESSORIES:

3. Seal disc shall be Buna-N rubber.
  4. Seats shall be 316 stainless steel.
  5. Diaphragm shall be nylon fabric with reinforced synthetic rubber.
  6. Valves shall be furnished with manufacturer's recommended accessories required for proper installation.
  7. All other bolts, screws, and accessories used in construction of valve internal components shall be constructed of Type 304 or 316 stainless steel or other corrosion-resistant material.
- L. Design:
1. Valve shall be single-acting non-throttling type.
  2. Internal components shall be designed such that there are no metal-to-metal contacts.
  3. Valve shall be suitable for a normal operating pressure of 90 psi.
  4. Valve shall be designed to prevent water hammer and include needle valve for adjusting closing speed.
  5. Closure shall be regulated by a 3-way valve.
  6. Valve shall include position indicator to show degree of opening at all times.
- M. Valve Controls:
1. Valve shall be capable of fully-open or drip-tight closure upon receiving electrical signal to solenoid control valves.
  2. The solenoid control operates the 3-way valve to apply or relieve pressure from the diaphragm chamber.
  3. Include all needle valves, strainers, interconnecting piping, fittings, cylinders, positioners, solenoid valves, limit switches, and other accessories essential to valve function factory assembled on valve body.
    - a. Small control valves shall be bronze or brass; piping shall be copper.
- N. Accessories:
1. Valve shall come equipped with limit switches to indicate fully open and fully closed positions.
    - a. Limit switches shall be dry contact type.
  2. Valve shall come equipped with position transmitter. Transmitter shall provide a 4-20mA signal.
  3. Valve shall come equipped with solenoid valve actuators suitable for opening and closing the valve and holding it in position.
- O. Testing:
1. Factory test valves, pilot valves, and needle valves at a hydrostatic pressure of not less than 200 psi and check leakage across the valves at a pressure of not less than 200 psi. Set valves to operate at the pressures specified previously.
  2. Control valves and pilot valves shall be subjected to an air pressure seat test, held for a minimum of 15 minutes without leakage.
  3. Submit copies of all test results.
- P. Shop Coating:
1. Exterior Surfaces: Coat exterior surface of valves with manufacturers standard primer in compliance with AWWA C504 for installation noted. Minimum dry film thickness shall be 6 mils. Manufacturer shall verify shop coat is compatible with final field coat as specified in Section 09 90 00.
  2. Interior Surfaces: Apply interior epoxy enamel coating conforming to AWWA C550 and NSF-61 to exposed metal surfaces. Minimum dry film thickness for epoxy enamel coating system shall be 10 mils. Interior coating shall be free of holidays.
  3. Provide affidavit or certificate of compliance to AWWA C504, AWWA C550, and NSF-61.

SECTION 33 12 16 - UTILITY VALVES AND ACCESSORIES:

Q. Valve Schedule: See attached Table 2.

2.04 CUSHIONED SWING CHECK VALVES:

- A. Acceptable Manufacturers:
  - 1. APCO, Valve and Primer Corporation.
  - 2. GA Industries, Inc.
  - 3. CCNE, Inc.
- B. Operational Requirements:
  - 1. Prevent reverse flow and cushioned to reduce shock or hammer.
  - 2. Seat tightly with internal pipeline forces.
  - 3. Cushioned with air cylinder controls in manner permitting adjustment of speed of closure.
- C. Design: Conform to AWWA C508 and as specified.
  - 1. Swing disc type with single shaft and flanged body. Flanges shall be ANSI B16.1, Class 125 or 250 or AWWA C207 Class as required. Contractor shall coordinate all flange types and drilling patterns.
  - 2. Cushion chamber(s) shall be mounted externally on valve body.
  - 3. Valve disc shall have external lever and counterweight to initiate closure.
  - 4. Suitable for 90 psi operating pressure.
- D. Materials and Construction:
  - 1. Valve body shall be cast iron, ductile iron, or steel.
  - 2. Valve disc shall be cast iron, ductile iron, or stainless steel.
- E. Shop Coating:
  - 1. Exterior Surfaces: Coat exterior surface of valves with manufacturers standard in compliance with AWWA C504 for installation noted. Minimum dry film thickness shall be 6 mils.
  - 2. Interior Surfaces: Apply interior epoxy enamel coating conforming to AWWA C550 and NSF-61 to exposed metal surfaces. Minimum dry film thickness for epoxy enamel coating system shall be 10 mils. Interior coating shall be free of holidays.
  - 3. Provide affidavit or certificate of compliance to AWWA C504, AWWA C550, and NSF-61.
- F. Valve Schedule: See attached Table 3.

2.05 RESILIENT-SEATED GATE VALVES:

- A. Acceptable Manufacturers:
  - 1. American Flow Control.
  - 2. Mueller Company.
  - 3. Stockham Valves and Fittings.
  - 4. U.S. Pipe & Foundry Company.
  - 5. No equal or substitute.
- B. Design:
  - 1. Conform to AWWA C509 and as specified.
  - 2. All stem seals shall be double O-ring type.
- C. Actuators:
  - 1. All valves shall open counterclockwise.
- D. Shop Coating:
  - 1. Exterior Surface: Coat exterior surface of valve with manufacturer's standard for installation noted.
  - 2. Interior Surface: Apply interior coating conforming to AWWA C550 and NSF-61 to

SECTION 33 12 16 - UTILITY VALVES AND ACCESSORIES:

all exposed ferrous metal surfaces. Provide affidavit or certificate of compliance with AWWA C550 and NSF-61.

3. Valve Disc: Valves having a stem hole or drainage hole in the disc shall have a coating inside of disc to meet or exceed the inside coating of valve body.
- E. Testing:
  1. Testing shall be performed conforming to AWWA C509. Valves shall have bubble-tight seat from either direction at working pressure of not less than 225 psi.
  2. Furnish certified copies of test results and affidavit of compliance to AWWA C509.
- F. Valve Schedule: See attached Table 4.

2.06 VALVE BOXES/EXTENSION STEM:

- A. Valve boxes shall be furnished and installed for all buried valves.
- B. Valve extension stems shall be furnished and installed for all buried valve locations in which the valve operating nut is 3 feet or more below the surface.
  1. The length of each extension stem shall be noted on the record drawings at the valve location.
- C. Acceptable Manufacturers:
  1. Clay and Bailey Manufacturing Company.
  2. Dresser Industries, Inc.
  3. Mueller Company.
  4. Neenah Foundry Company.
  5. Tyler Company.
- D. Design:
  1. Boxes shall consist of a cast-iron cover, lid, and base castings with 150 mm (6-inch) cast-iron pipe shaft.
  2. Provide extension stem to bring operating nut within 2-feet of valve box top.
  3. Drop cover shall be marked for the appropriate system.

2.07 CORPORATION STOPS:

- A. Provide corporation stops as specified and indicated to isolate combination air valves or as manual drain, air release or inlet valves. Size shall be specified or indicated.
- B. Mueller Company Style H-10003, H10013, or H-10045 or Engineer-approved equal, as applicable.
- C. Corporation stops shall conform to NSF 372, Reduction of Lead in Drinking Water Act.

2.08 SHOP PAINTING:

- A. Prepare surfaces and paint or coat all valves, fire hydrants, floor stands, valve boxes, corporation stops, and all related accessories standard of the manufacturer unless otherwise specified herein.
- B. Paint and coatings shall be suitable for the service intended.
- C. Submit type of paint or coating proposed with drawings and data for Engineer approval prior to fabrication.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. Comply with provisions of AWWA C600 and as specified.

SECTION 33 12 16 - UTILITY VALVES AND ACCESSORIES:

- B. Thoroughly clean and remove all shipping materials prior to setting. Operate all valves from fully opened to totally closed.
  - C. Equip with anchorage where indicated.
  - D. Set fire hydrants with lowest nozzle 18 inches above finished grade. Check and fill stem bonnet lubricant reservoir.
- 3.02 FIELD PAINTING: Surface preparation and finish painting are specified in Section 09 90 00.
- 3.03 FIELD TESTING:
- A. Perform on piping and valves as specified in Section 33 31 50 and for the following:
    - 1. Altitude valves.
    - 2. Gate valves.
    - 3. Butterfly valves.
    - 4. Check valves.
    - 5. Fire Hydrants.
    - 6. Non-Manual valves
      - a. Furnish services of manufacturer's engineer to perform field tests to determine that the valve will operate as specified and to make any adjustments required to improve operation of the valves.
      - b. Furnish all instruments required to record pressure during tests.
      - c. Field tests shall be witnessed by Engineer.

END OF SECTION 33 12 16

**Table 1 - Butterfly Valve Schedule:**

No.	Size (inches)	Location	Installation	Bury Depth (feet)	Valve Ends	Shaft Position	Actuator Type	Condition
BFV-01	30	Valve Room	Exposed-Interior	N/A	FLGxFLG	Horizontal	Handwheel	Open/Close
BFV-02	30	Valve Room	Exposed-Interior	N/A	FLGxFLG	Horizontal	Chainwheel	Open/Close
BFV-03	30	Valve Room	Exposed-Interior	N/A	FLGxFLG	Horizontal	Handwheel	Open/Close
BFV-04	30	Valve Room	Exposed-Interior	N/A	FLGxFLG	Horizontal	Chainwheel	Open/Close
BFV-05	24	Yard	Buried	7.5	MJxMJ	Vertical	AWWA Nut	Open/Close
BFV-06	16	Yard	Buried	12	MJxMJ	Vertical	AWWA Nut	Open/Close
BFV-07	30	Valve Room	Exposed-Interior	N/A	FLGxFLG	Horizontal	Handwheel	Open/Close
BFV-08	24	Yard	Buried	9	MJxMJ	Vertical	AWWA Nut	Open/Close
BFV-09	24	Yard	Buried	9	MJxMJ	Vertical	AWWA Nut	Open/Close

**Table 2 - Altitude Valve Schedule:**

No.	Size (inches)	Location	Installation	Bury Depth (feet)	Valve Ends	Installed Position	Actuator Type
AV-01	30	Valve Room	Exposed-Interior	N/A	FLGxFLG	Horizontal	Electric Hydraulic

**Table 3 - Check Valve Schedule:**

No.	Size (inches)	Location	Valve Type	Design Operating Pressure (psi)	Maximum Operating Pressure (psi)	Installation	Valve Ends
CV-01	30	Valve Room	Tilting Disc Check Valve	90	150	Exposed-Interior	FLGxFLG

**Table 4 - Gate Valve Schedule:**

**SECTION 33 12 16 - UTILITY VALVES AND ACCESSORIES:**

<b>No.</b>	<b>Size (inches)</b>	<b>Location</b>	<b>Design Operating Pressure (psi)</b>	<b>Maximum Operating Pressure (psi)</b>	<b>Installation</b>	<b>Valve Ends</b>	<b>Actuator Type</b>
GV-01	6	Yard	90	150	Buried	MJxMJ	AWWA Nut

## SECTION 33 16 11 – COMPOSITE ELEVATED WATER STORAGE TANKS

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. The Work to be performed shall include all labor, materials and equipment necessary for the design, fabrication, delivery, erection, inspection, and testing for all welded steel elevated water storage tanks supported by a reinforced concrete pedestal with a capacity, height, and accessories as indicated or specified.
- B. The Work shall also include all labor, materials, and equipment necessary for the design and construction of the foundation system including all site work indicated or specified.
- C. Related Work Specified Elsewhere:
  - 1. Procurement and Contracting Requirements: Division 00.
  - 2. General Requirements: Division 01.
  - 3. Doors and Windows: Division 08.
  - 4. Finishes: Division 09.
  - 5. Electrical: Division 26.
  - 6. Utilities: Division 33.

#### 1.02 REFERENCES:

- A. The latest edition of the following documents and standards are part of this specification to the extent specified herein.
  - 1. American Concrete Institute (ACI):
    - a. ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials.
    - b. ACI 228.1 – In-Place Methods to Estimate Concrete Strength.
    - c. ACI 304 – Guide for Measuring, Mixing, Transporting and Placing Concrete.
    - d. ACI 305 – Guide to Hot Weather Concreting.
    - e. ACI 306 – Guide to Cold Weather Concreting.
    - f. ACI 318 – Building Code Requirements for Structural Concrete.
    - g. ACI 347 – Guide to Formwork for Concrete.
    - h. ACI 371 – Guide for the Analysis, Design, and Construction of Elevated Concrete and Composite Steel – Concrete Water Storage Tanks.
  - 2. American Society of Mechanical Engineers:
    - a. ASME B16.5 – Pipe Flanges and Flanged Fittings.
  - 3. American Petroleum Institute (API):
    - a. API 650 – Welded Tanks for Oil Storage.
  - 4. ASTM International (ASTM):
    - a. ASTM A123 – Standard Specifications for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
    - b. ASTM A240 – Standard Specifications for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
    - c. ASTM A285 – Standard Specifications for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength.
    - d. ASTM A615 – Standard Specifications for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
    - e. ASTM A774 – Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
    - f. ASTM A778 – Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products.

- g. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - h. ASTM C33 – Standard Specifications for Concrete Aggregates.
  - i. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - j. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
  - k. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement.
  - l. ASTM C150 – Standard Specification for Portland Cement.
  - m. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
  - n. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
  - o. ASTM C900 – Standard Test Method for Pullout Strength of Hardened Concrete.
  - p. ASTM C1074 – Standard Practice for Estimating Concrete Strength by the Maturity Method.
- 5. American Water Works Association (AWWA):
    - a. AWWA C200 – Steel Water Pipe - 6 in. (150 mm) and Larger.
    - b. AWWA C652 – Disinfection of Water Storage Facilities.
    - c. AWWA D100 – Welded Steel Tanks for Water Storage.
    - d. AWWA D102 – Coating Steel Water Storage Tanks.
    - e. AWWA D107 – Composite Elevated Tanks for Water Storage.
    - f. AWWA M11 – Steel Pipe: A Guide For Design and Installation
  - 6. Federal Aviation Administration (FAA):
    - a. FAA AC 70/7460-1H – Advisory Circular Obstruction Marking and Lighting.
    - b. FAA AC 150/5345-43J – Advisory Circular Specifications for Obstruction Lighting Equipment.
  - 7. National Association of Corrosion Engineers (NACE):
    - a. NACE RP0178 – Standard Practice – Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.
  - 8. National Fire Protection Association (NFPA):
    - a. NFPA 780 - Standard for the Installation of Lightning Protection Systems.
    - b. NFPA 70 – National Electric Code (NEC).
  - 9. National Sanitation Foundation International (NSF):
    - a. NSF 61 - Drinking Water System Components – Health Effects.
    - b. NSF 372 – Drinking Water System Components – Lead Content.
  - 10. Occupational Safety and Health Administration (OSHA):
    - a. OSHA 29 CFR Part 1926 - Safety and Health Regulations for Construction.
  - 11. Steel Structures Painting Council (SSPC):
    - a. SSPC VIS 1-89 - Visual Standard for Abrasive Blast Cleaned Steel.

1.03 DEFINITIONS:

- A. Capacity: The nominal net volume, in gallons, that may be removed from a tank filled to the top capacity level (TCL) and emptied to the bottom capacity level (BCL).
  - 1. Top Capacity Level (TCL): The elevation of the lip of the overflow.
  - 2. Bottom Capacity Level (BCL): The elevation of the lip of the outlet.
- B. Composite Elevated Tank (CET): A welded steel tank designed to the AWWA D107 Standard and supported on a reinforced concrete pedestal (tower) with all water being contained within the welded steel tank membrane.
- C. Head Range: The vertical distance between the BCL and the TCL.

1.04 SUBMITTALS:

- A. Submit as specified in Division 1.

- B. Submit with Bid:
  - 1. Sketch(es) of the tank showing major dimensions, materials of construction, accessories to be furnished, and other information necessary to establish compliance with the specifications.
  - 2. Sketch(es) of the general foundation configuration showing preliminary dimensions and approximate quantities of concrete and reinforcing steel.
  - 3. Coating system to be furnished including surface preparation, application method, and coating thickness for each coat required.
  - 4. A volume/elevation curve (i.e., gage table) shall be submitted to the Owner and Engineer.
  - 5. List of at least three (3) Composite Tanks, 3.0 MG or greater, designed and constructed by the Bidder. Include location, construction year, and project contact (name and address of purchasing entity) for each.
- C. Provide elevation, plan, and sectional view drawings of the foundation, support structure, tank, and all appurtenant equipment and accessories. Show the location, dimensions, material specifications, and finish requirements.
- D. Foundation details shall include excavation, soil protection, and backfill.
- E. Reinforced concrete details shall include construction joints, openings, and inserts. Reinforcement shall be clearly indicated on the structural drawings and identified by mark numbers that are used on the fabrication schedule. Location, spacing, grade of steel, and splice dimensions shall be shown. Placement and fabrication details shall conform to ACI 318.
- F. Steel tank details shall include weld joints and a layout showing all primary and secondary shop and field welds.
- G. Provide design, detail drawings, and procedures for the support structure forming system. Details shall include location of form and construction joints, rustications, and ties. Procedures shall include form removal criteria and minimum elapsed time for adjacent concrete placement.
- H. Provide shop and field weld procedures for all structural joints on the steel tank.
- I. Provide a gage table showing capacity of the tank in gallons at all levels in one-foot increments.
- J. Provide a summary of the design for the foundation, support structure, tank, and other components. Include the design basis, loads, and load combinations and results.
- K. Provide a separate concrete mix design for each concrete compressive strength required or specified. Include fine and coarse aggregate gradation data.
- L. Provide technical data and color samples of all coating products.
- M. Provide manufacturers descriptive information for appurtenant equipment and accessories that are not detailed on the construction drawings.
- N. Reports/Certification:
  - 1. Provide documentation of all tests, inspections, and certifications required by this section.
  - 2. Provide qualifications of all welders prior to start of welding operations.
- O. Operation/Maintenance:
  - 1. Provide operating instructions and maintenance procedures for the elevated tank and applicable appurtenant equipment, mechanical components, and accessories.
- P. Contract closeout Submittals as specified in Section 01 33 00 and PART 3 of this Section.
  - 1. Provide an electronic copy, in AutoCAD format, of the “as-constructed” tank and foundation shop drawings.

1.05 QUALITY ASSURANCE:

SECTION 33 16 11 – COMPOSITE ELEVATED WATER STORAGE TANKS: continued

- A. The materials, design, fabrication, erection, inspection, and testing of the CET, foundation, and related appurtenances shall conform to the latest edition of AWWA D107 and ACI 371.
  - B. Acceptable Manufacturers:
    - 1. Landmark Structures, LP.
    - 2. Caldwell Tanks, Inc.
    - 3. No equal or substitute.
  - C. Certifications:
    - 1. All final drawings and design calculations for the CET and foundation shall be signed and sealed by a professional engineer registered in the state of Missouri.
    - 2. All welders shall be qualified in accordance with the requirements of Section 5.4 of AWWA D107.
    - 3. Concrete field testing shall be performed by an ACI Concrete Field Testing Technician – Grade 1.
- 1.06 DELIVERY, STORAGE AND HANDLING:
- A. Handling and Shipping:
    - 1. The Contractor shall handle materials and fabricated components in a manner that will protect them from damage. Allow painted materials adequate cure time prior to stacking or shipping.
  - B. Storage and Protection:
    - 1. Protect delivered materials and equipment from damage. Store in well drained areas and provide blocking to minimize contact with the ground.
    - 2. See Section 33 01 10.59 for leakage requirements.
- 1.07 WARRANTY:
- A. Tank manufacturer shall warrant workmanship and materials on the completed CET for a period of five (5) years from the date of Substantial Completion.
    - 1. In the event that defects or leakage is observed within the warranty period, tank manufacturer shall promptly prepare tank at their own expense upon written notice by the Owner of said defects or leakage.

PART 2 - PRODUCTS

- 2.01 GENERAL REQUIREMENTS:
- A. General Design Standards
    - 1. The structural design of the Composite Elevated Water Storage Tank shall conform to AWWA D107 and the following design standards. In case of conflict between the Standard and the criteria listed below, the more stringent requirement shall apply.
    - 2. Reinforced Concrete Foundation - ACI 318.
    - 3. Concrete Support Structure – AWWA D107 and ACI 318.
    - 4. Welded Steel Water Tank – AWWA D107.
  - B. Operating Parameters
    - 1. New 3.0 MG Tank:
      - a. Minimum Capacity: 3,000,000 gallons (3.0-MG) within operating range.
      - b. Top Capacity Level: Elevation 1,160.00 feet.
      - c. Head Range: 47.5 ft (+/- 2.5 ft.)
      - d. Tank Diameter: To be coordinated with Tank Erector.
      - e. Pedestal Diameter: 59 feet (+/- 5 ft.).
      - f. Top of Interior Slab-on-Grade: as indicated.
      - g. Maximum Fill Rate: 8,333 gpm.
      - h. Average Fill Rate: 1,750 gpm.

SECTION 33 16 11 – COMPOSITE ELEVATED WATER STORAGE TANKS: continued

- i. Maximum Overflow Rate equals the Maximum Fill Rate plus 10%.
  - j. Maximum Draft Rate: 12,677 gpm.
- C. The exterior pedestal wall face shall incorporate uniformly spaced horizontal and vertical rustication strips, which will create a symmetric architectural pattern. Horizontal construction joints shall be equally spaced over the pedestal height and shall occur at rustication strips.

2.02 MATERIALS:

- A. Reinforced Concrete:
  - 1. Concrete materials and reinforcement shall comply with ACI 318, except as modified herein.
  - 2. Cement shall conform to ASTM C150, Type I/II.
  - 3. Fine and Coarse aggregates shall conform to ASTM C33.
  - 4. Admixtures shall not contain chloride ions.
  - 5. Minimum compressive strength shall be 4000 psi at 28 days, unless noted otherwise.
  - 6. Water-Cementitious material ratio shall not exceed 0.50.
  - 7. Concrete shall be air entrained in accordance with ACI 318.
  - 8. Slump:
    - a. 3 to 5 inches at the point of placement without high-range water-reducing admixtures (HRWRA).
    - b. 8 inches maximum after addition of HRWRA.
- B. Steel Tank:
  - 1. Steel tank components, including steel plates, sheets, structural shapes, and filler metals shall be in accordance with AWWA D107.
  - 2. Contractor shall coordinate Owner's inspection of steel plates at manufacturer's factory location prior to transporting plates to work site(s).

2.03 DESIGN & FABRICATION:

- A. Design and fabricate the tank in accordance with the applicable sections of AWWA D107, ACI 318, and ACI 371, unless otherwise specified.
- B. Seismic: Seismic Design Category "B".
- C. Wind: Exposure Category "C".

2.04 CONCRETE FOUNDATION:

- A. The concrete foundation shall be designed by the tank manufacturer and shall be designed in accordance with ACI 318. Minimum specified compressive strength shall be 4000 psi at 28 days. Reinforcing steel shall be ASTM A615 Grade 60. The service load reinforcement tension stress shall not exceed 30,000 psi under dead plus water load unless flexural cracking is otherwise controlled in accordance with ACI 318. See geotechnical report.

2.05 CONCRETE PEDESTAL:

- A. The concrete foundation shall be designed in accordance with ACI 318. The specified compressive strength of concrete shall be as required by design, but not less than 4000 psi at 28 days. The maximum specified compressive strength of concrete for the wall and dome shall be 5500 and 4500 psi respectively.
- B. Support Wall:
  - 1. Support wall shall be reinforced concrete with a minimum thickness of 8 inches exclusive of any architectural relief. Wall thickness shall be provided such that the average compressive stress due to the weight of the structure and stored water is limited to 25% of specified compressive strength, but not greater than 1000 psi. A minimum total wall reinforcement of 0.15% vertically and 0.20% horizontally shall be distributed approximately equally to each face. A minimum of 0.75% vertical reinforcement shall be

provided in the top 6 ft. of the wall extending into the concrete ring beam. Minimum concrete cover for interior / exterior faces shall be 1 inch and 1-1/2 inches respectively.

C. Tank Floor:

1. Tank floor shall be a reinforced concrete dome not less than 8 inches thick. The average compressive stress due to the weight of the structure and stored water shall not exceed 15% of the specified compressive strength, nor greater than 600 psi. Minimum total reinforcement in orthogonal directions shall be 0.40% distributed approximately equally to each face. Additional reinforcement shall be provided for stress caused by edge restraint effects.

D. Openings:

1. The effects of openings in the wall shall be considered in the design. Not less than 60% of the interrupted reinforcement in each direction shall be placed each side of the opening. Reinforcement shall extend past the opening not less than half the transverse opening dimension.
2. Openings larger than 24 inches shall be designed using an effective beam and column analysis as per AWWA D107 Section 6.3. Each side of the opening shall be designed as a column in accordance with ACI 318.
3. Openings 8 ft. 0 in. or wider used for vehicle access shall be strengthened against vehicle impact.

2.06 CONCRETE PEDESTAL / STEEL TANK INTERFACE:

A. Interface Region:

1. The interface region includes those portions of the concrete support structure and steel tank affected by the transfer of forces from the tank cone and the tank floor to the concrete support wall. This includes a ring beam and connection details. The Contractor shall provide evidence that a thorough review of the interface region has been performed. Finite element and finite difference analyses are the required methods for examining such local stresses in detail.
2. The geometry of the interface shall provide for positive drainage and not allow either condensate or precipitation to accumulate at the top of the concrete wall or ring beam.
3. Steel tank floor liner plates shall be fabricated to conform to the supporting concrete dome and may be placed directly on the concrete. Where liner plate does not conform to the supporting concrete dome, a minimum of 1-inch void shall be provided between the steel tank floor plate and the concrete dome. After testing for leaks and repairing any void shall be filled with flowable grout.

B. Ring Beam:

1. The ring beam shall be reinforced concrete with a nominal width and height of at least two times the support wall thickness. Minimum radial and circumferential reinforcement shall be 0.25%. For direct tension, reinforcement shall be provided such that the average service load stress in tension reinforcement due to the weight of the structure and stored water does not exceed 12,750 psi.
2. Ring beam design shall consider unbalanced forces from the steel tank cone and concrete dome, load conditions varying with water level, eccentricity of loads resulting from design geometry, and allowance for variations due to construction imperfection and tolerance.

2.07 STEEL TANK:

A. General:

1. The steel tank shall be all welded construction and shall be designed in accordance with applicable sections of AWWA D107. The required capacity and dimensions of the tank

are noted on the drawings and in this section of the specifications. All exposed lap joints shall be fully seal welded on both sides.

2. The roof of the steel tank may be conical or dome in shape.
3. Steel finish. See Section 09 90 00.
- B. Plate Thickness:
  1. All members shall be designed to safely withstand the maximum stress to which they may be subjected during erection and operation. The minimum thickness of any steel plate shall be 1/4 in., except that plate used as a membrane over the structural concrete floor shall have a minimum thickness of 3/16 in.
- C. Roof Support:
  1. All structural members supporting the roof of the steel tank shall be flat bar or sealed square tubular sections. I-beams or other sections with horizontal projections may be used if the nominal depth is 10 in. or greater. Support beams shall be seal welded to the underside of the roof plate along the entire length of the beam.
- D. Cone:
  1. Design shall be in accordance with AWWA D107.

2.08 PROTECTIVE COATINGS:

- A. Shop Painting:
  1. Manufacturer shall prepare surfaces, prime, and finish paint all interior and exterior iron and steel surfaces with manufacturer's standard coating system suitable for service intended and compatible with final field coat as specified in Section 09 90 00.
  2. Interior coatings coming into contact finished potable water shall be NSF 61 product certified.

2.09 APPURTENANCES AND ACCESSORIES:

- A. General:
  1. Accessories shall comply with the minimum requirements of the Specifications, Codes and Standards listed in Paragraph 1.02, current applicable safety regulations, and the operating requirements of the structure.
- B. Personnel Access:
  1. Locations:
    - a. The tank floor manhole shall be provided with ladder access from the upper platform.
    - b. A ladder shall extend from the upper platform through the access tube interior to the roof.
- C. Ladders:
  1. Ladders shall be provided:
    - a. Inside the tank bowl on the outside of roof access tube, spanning from bottom of bowl to roof.
    - b. Inside roof access tube, spanning from top landing platform to roof.
    - c. From top landing platform to manhole located on the bottom of the bowl.
  2. Ladders located in the concrete support structure and access tube interior shall be galvanized steel. Tank interior ladders shall be carbon steel and coated in accordance with the tank interior coating system.
  3. Ladder side rails shall be a minimum 3/8 in. by 2 in. with a 16 in. clear spacing. Rungs shall be minimum 3/4 in. diameter, spaced at 12 in. centers and plug welded into holes drilled in the side rails. Tank interior ladders shall be provided with 1 in. diameter rungs and 1/2 in. x 2 in. side rails and shall be fully seal welded.
  4. Ladder shall be secured to the adjacent structure by brackets located at intervals not exceeding 10 ft. Brackets shall be of sufficient length to provide a minimum distance of 7 in. from the center of rung to the nearest permanent object behind the ladder. Ladder

brackets located on the access tube exterior shall be reinforced at the access tube shell so that potential ice damage is confined to the ladder and bracket and not the access tube shell.

5. Ladders that terminate at platforms or landings shall extend a minimum of 48 in. above the platform elevations.
  6. A safety extension shall be provided at the top of the ladder under hatch(s). The safety extension shall be a Ladder Up Safety Post as manufactured by Bilco or equal. The post shall extend 42-inches above the top of the ladder and be constructed of hot dip galvanized steel. Mounting hardware shall be galvanized.
- D. Safe Climbing Device:
1. High strength aluminum, rigid rail safe climbing devices shall be provided on all ladders. Rails shall be center mounted and extend from 3 ft. above the ladder bottom to the top of the ladder section. Mounting brackets, fasteners, and splice bars shall be provided as required for a rigid installation.
  2. Three trolleys with snap hooks shall be provided that are designed to be operated with the aluminum rail. A safety body harness with front and side rings shall be supplied for each trolley.
  3. A caution sign shall be provided at the lowest point of access to the ladder requiring safe climbing devices. The sign shall read “CAUTION – Safety Equipment Required When Climbing Ladder”. The sign shall be secured to the wall.
- E. Platforms:
1. A minimum 4 ft. wide upper walkway platform shall be located at the top of the support wall to provide access from the support wall ladder to the roof access ladder and tank bottom man-way located on the interior of the access tube. Platforms shall be provided with handrails, mid rails, and toe plates in accordance with OSHA requirements. Grating shall be used for the walking surface. All components shall be galvanized steel.
- F. Support Wall Doors:
1. Personnel Doors: See Section 08 16 13.
    - a. Hardware: Installation, operation, and mounting of doors, see Section 08 70 00.
  2. Overhead Vehicle Door: Door installation shall be on the interior face of the support wall. The door frame shall be a steel plate fabrication suitably detailed, fastened and reinforced to accept the door. Operation shall be manual with a chain hoist. The curtain shall be formed of 22-gauge steel interlocking slats with end locks and wind locks designed for a wind loading of 20 psf. Torsion springs shall be mounted on a solid torsion rod, which is attached to an exterior mounted spring tension adjustment wheel. A 24-gauge steel hood shall be provided with a weather seal to protect the assembly. Steel brackets shall be installed to the interior face of the wall with expansion anchors which enclose and support the counterbalance assembly with sealed bearings. Steel curtain guides are mounted to the brackets. The curtain, bottom bar, brackets, guides, hood, pipe, and chain shall be galvanized. Provide with locking device. Size, quantity, and location of vehicle door(s) shall be as shown on the drawings.
- G. Tank Openings:
1. Floor: Provide a minimum 30 in. diameter manhole through the tank floor. The manhole shall be operable from a ladder located on the upper platform and shall be designed to withstand the pressure of the tank contents without leakage. The manhole assembly shall include a stainless steel hand wheel operator and threaded components.
  2. Roof: Provide one minimum 30 in. square weatherproof access hatch adjacent to the access tube to allow access to the interior of the tank via the ladder mounted on the exterior of the access tube. The opening shall have a minimum 4 in. curb. Provide aluminum covers with a 2 in. down turned edge, stainless steel hardware, hold open arm, and a locking mechanism.

H. Access Tube:

1. Provide a minimum 60 in. diameter centrally located access tube through the steel tank to provide access to the tank roof from the upper walkway platform. The access tube shall incorporate a 2 in. by 2 in. channel to collect condensation that may form on the interior surface. A flexible 3/4 in. PVC hose shall drain the channel, route, and connect to the 1 in. PVC sample drain piping and discharge no less than 3 in. above a floor drain connected to the overflow drainage splash pad.
2. Provide access tube extension with ships door in lieu of roof hatch. Extension shall be a manufactured unit. Extension shall be painted white with same coating system as that used on the exterior of the tank.

I. Roof Railing:

1. A 42 in. high roof handrail shall be provided to enclose all centrally located roof accessories. The roof railing shall be a minimum of 20 ft. in diameter.

J. Rigging Access:

1. Provide a 24 in. x 36 in. opening at the top of the support wall. This opening shall be accessible from a platform and shall provide access to the exterior rigging rail located at the tank/support wall intersection. The access opening shall be provided with a hinged stainless steel cover or a removable vent.
2. A minimum 24 in. diameter opening shall be provided on the tank roof to provide access to the tank interior rigging rail.

K. Rigging Rails:

1. Provide permanently installed rigging rails suitable for rolling trolleys at the interior of the tank at the wall/roof and access tube/roof connections. Provide an exterior rigging rail at the base of the tank adjacent to the support structure.

L. Davit Bases:

1. Install davit base at each roof access opening to tank bowls, except access tube opening.
2. Tank manufacturer shall furnish and install davit bases. Installation shall be in accordance with manufacturer's instructions. Fabrication material shall be stainless steel.

M. Piping:

1. Inlet Riser and Discharge Riser Pipes: Provide separate inlet riser and discharge riser pipes to extend from the Valve Room to the tank bowl floor elevation. The pipe and valving material transitioning from the common inlet/outlet yard piping into the valve room shall be ductile iron in accordance with Sections 33 11 00 – Pressure Pipe and 33 12 16 – Utility Valves and Accessories. The pipe material extending from the valves within the Valve Room to the tank bowl shall be Type 304L stainless steel conforming to AWWA C200 and AWWA M11. Refer to process drawings D102 – Elevated Tank Section and D103 – Overflow Piping for transition point between ductile iron and stainless steel pipe materials.
  - b. The piping for the discharge riser and inlet riser shall be designed to support all related static and dynamic loads. Suitable galvanized steel brackets, guides and hangers shall be provided on the support wall and tank floor at intervals not exceeding 20 feet.
  - c. The discharge riser and inlet riser shall be designed and constructed to accommodate any differential movement caused by settlement and by thermal expansion and contraction over the range of extreme temperature differences expected for the support wall and pipe. The required flexibility shall be provided by an expansion joint located in the vertical section of pipe and shall be a bellows type flange-to-flange and shall match material used in discharge riser and inlet riser, and shall be determined by the Tank Manufacturer.
2. Overflow Pipe: Design and provide an overflow pipe of sufficient diameter to accommodate the maximum overflow rate specified. The top of the overflow shall be

- located within the tank at the overflow elevation. It shall run vertically beside the central access tube and extend through the tank bowl floor, at which point it shall turn 90° and run under the tank floor to the support wall. This horizontal run shall be sloped to drain. The pipe shall then turn 90° and run vertically beside the support wall to grade. A base elbow shall direct the overflow through the support wall, where the pipe shall be terminated with a check valve. Pipe material within the support structure shall be Type 304L stainless steel. If the top of overflow is located above top capacity level, the tank shall be designed for the additional capacity provided by the difference.
- d. The entrance to the overflow pipe shall be designed for the maximum inlet flow rate specified. The design shall be based on the water level cresting within 6 in. above the overflow elevation. A conical weir shall be provided if the entrance capacity of the overflow pipe diameter is not adequate. A vortex prevention device shall be used.
  - e. The overflow shall be designed to support all related static and dynamic loads. Suitable galvanized steel brackets, guides and hangers shall be provided on the support wall and tank floor at intervals not exceeding 20 ft. The overflow pipe and weir section within the tank shall be stainless steel and supported by the central access tube.
  - f. The overflow pipe shall be designed and constructed to accommodate any differential movement caused by settlement and by thermal expansion and contraction over the range of extreme temperature differences expected for the support wall and pipe. A layout with sufficient upper offset to accommodate differential movement is acceptable. If this method is not applicable, the required flexibility shall be provided by an expansion joint located near grade in the vertical section of pipe.
  - g. The overflow pipe shall penetrate the support wall through a discharge through a flap valve into a overflow drainage concrete splash pad. Pipe penetration and check valve shall be located to allow for an airgap of no less than 12-inches and no more than 24-inches above the overflow drainage concrete splash pad.
  - h. The overflow pipe shall terminate with a flanged elastomeric duckbill-style check valve.
3. Sampling Facilities: Sampling facilities shall consist of 1-inch piping and valves located no more than one-quarter of the length of the tank bowl from the bottom access point to obtain a sample within the roof access tube. Sample piping shall extend 3-inches into the bowl near the ladder and include a ball valve and flexible hosing. The flexible hosing shall be routed to a funnel or cup located 12-inches below the hose to provide an air gap and space to collect samples.
- i. 1-inch sample line effluent from collection cup or funnel shall be sloped, combined with the condensation drain, and routed to an interior floor drain discharging to the overflow structure. Piping shall be properly supported. The combined line shall terminate with a flap gate valve and mesh stainless steel removable insect screen.
  - j. The connection to the wall of the roof access tube shall be made with welded fittings with welded or threaded outlets.
4. Stainless Steel Requirements: See Section 33 11 00.
5. Tank Drain: A tank drain shall be provided to completely drain the tank contents if the inlet/outlet pipe does not intersect the low point of the tank. A 4” stainless steel drainpipe located at the low point of the tank floor shall connect and drain to the overflow pipe via flexible hose. The 4” stainless steel drainpipe will be fitted with a flanged 4” stainless steel ball valve.
6. Tank Bowl Penetrations:

- a. Provide design and details for water-tight seals for all pipe penetrations between the tank pedestal, concrete dome, and steel tank bowl.
- b. Design of penetrations and welding shall be in conformance with AWWA D107.

N. Ventilation:

1. Tank Ventilation: A tank vent shall be provided, located centrally on the tank roof above the maximum weir crest elevation. It shall consist of stainless steel or aluminum components, including a support frame, screened area and cap. The support shall be fastened to a flanged opening in the tank roof. The vent cap shall be provided with sufficient overhang to prevent the entrance of wind driven debris and precipitation. A minimum of 4 in. shall be provided between the roof surface and the vent cap.
  - k. The tank vent shall have an intake and relief capacity sized to prevent excessive pressure differential during the maximum flow rate of water, either entering or leaving the tank. The overflow pipe will not be considered as a vent. The maximum flow rate of water entering the tank is as specified. The maximum flow rate of water exiting the tank shall be taken as the greater of the specified maximum draft rate or that calculated assuming a break in the inlet/outlet at grade when the tank is full. The vent shall be frost-proof and provided with a non-corrodible 24-mesh insect screen. Vent capacity shall be determined based on open area provided by the screen.
    - l. In addition to the tank vent, a pressure/vacuum relief mechanism shall be provided that will operate in the event of vent failure. The mechanism shall be designed to return automatically to its original position after operation. The pressure/vacuum relief mechanism shall be located on the tank roof above the maximum weir crest elevation, and may be incorporated in the vent assembly.
2. Support Structure Ventilation: Ventilation within the support structure shall comply with the governing building code requirements, based on occupancy classification. As a minimum, one louvered vent shall be provided at the top of the support wall. This vent shall be accessible from the upper platform and may also be designed to provide access to the exterior rigging rails located at the tank/support wall intersection. Vents shall be accessible from the interior ladders, platforms or floors provided. Vents shall be stainless steel or aluminum and provided with a removable insect screen.

O. Interior Floors:

1. Gravel Floor: The interior based of the pedestal, but outside of the Valve Room, shall be finished with a 6-inch crushed stone or gravel floor. All excavated areas under the crushed stone or gravel floor shall be backfilled with suitable material and compacted to 90 percent maximum dry density.
2. Slab on Grade: Provide a minimum 8 in. thick, 4000 psi concrete floor slab in the base of the Valve Room. The slab shall be supported on a minimum of 6 inches compacted granular fill. The slab will extend beyond the drywall and into the pedestal flooring according to the structural drawing S003 – Base Plan.

P. Tap Connections:

1. Level Monitoring:
  - a. Provide minimum of one (1)  $\frac{3}{4}$  inch tapped connections into the spool piece upstream of the discharge piping check valve. Each connection shall be provided with a stainless-steel nipple and an isolation ball valve with  $\frac{3}{4}$  inch FNPT ends.
  - b. Provide pressure and level monitoring instrumentation as indicated on drawings and Division 40.
2. Chlorine Monitoring and Sampling:

- a. Provide three (3) 3/4 in. tapped connections into the common inlet/outlet pipe, as indicated in the drawings. Each connection shall be provided with a stainless-steel nipple and an isolation ball valve with 3/4in FNPT end.
  - b. Provide chlorine monitor as indicated on drawings and Division 40.
- Q. Provisions for Telecommunications Cable (Antenna) Routing:
1. Steel bowl, roof guard railings, and access tube shall be designed to support the following for future telecommunication cable installations:
    - a. The roof and roof guardrail shall be spaced approximately 5 feet on center for mounting future antennas, total number will vary per tank. The roof and guardrail shall be designed to support an 8-ft high fiberglass screen.
    - b. The roof and roof opening shall be designed to accommodate installation of a future pod mount antenna assembly, including cables, mounting equipment & hardware, and future 8-ft fiberglass screen. Design shall accommodate up to three (3) pod mounted vertically stacked assemblies.
  2. Entry Panels:
    - a. Tank manufacturer shall furnish and install entry panels for cable conduit in the concrete support column wall. Entry panels shall be manufactured by Valmont Microfect.
      - 1) Installation of entry panels shall be performed as recommended by tank manufacturer. Perimeter seals shall be watertight.
    - b. Each panel shall include 4-in diameter ports and be furnished with all mounting hardware and watertight port seals.
      - 2) Location and number of ports shall be as follows:
        - i. Support column floor: Two (2) panels consisting of 18 ports, installed near the base of concrete support column.
        - ii. Support column top: Four (4) entry panels consisting of four (4) ports installed near the top of concrete support column.
        - iii. Exact location of panels shall be as recommended by tank manufacturer and approved by Owner.
- R. Lightning Protection:
1. Provide a lightning protection system for the Composite Elevated Tank and any roof mounted equipment that may be damaged by lightning. Install the system in accordance with NFPA 780 with materials that meet UL96 and UL96a.
  2. Minimum requirements include two 28 strand by 14-gauge copper conductors bonded to the steel tank 180 degrees apart. The conductors shall be fastened to the exterior of the concrete support structure at 3 ft. minimum spacing and shall be bonded to the buried counterpoise around the base of the support structure.
- S. Nameplate:
1. Provide stainless steel nameplate identifying the following information:
    - a. Tank Manufacturer.
    - b. Date of Construction.
    - c. Volume.
    - d. Overflow Elevation (AMSL).
    - e. Foundation Level (AMSL).

2.10 ELECTRICAL, CONTROL SYSTEMS, AND LIGHTING:

- A. Electrical work shall be in accordance with Division 26 and 40.
- B. New Federal Aviation Administration (FAA) approved obstruction lighting shall be installed on the new elevated storage tank.
- C. Tank Control Panel:
  1. Provide new control Panel.

D. Obstruction Lighting:

1. All lighting systems shall be tested and certified per FAA AC 150/5345-43J.
  - a. Systems shall be dual fixture type with a lamp-out relay switch to an alternate fixture.
  - b. Systems shall utilize primary and backup fixtures, a single control panel shall be provided to monitor the status of all lamps and be able to switch from primary to backup fixture should a lamp fail or an operator manually initiate the switch.
  - c. Pilot lights located at the control panel shall be provided to indicate when either fixture has failed.
2. All fixtures shall be centrally located on the roof of the tank 12 inches above all permanent installations. Individual fixture controllers and system control panel will be mounted remotely in the valve room at the base of the support pedestal.
3. Fixtures:
  - a. Shall have a cast aluminum housing and gasketed access cover with powercoat paint, with NEMA 4X rating.
  - b. Covers shall have captive screws and shall be secured to the unit with a tether.
  - c. Die cast aluminum mounting frame.
  - d. Lenses shall be red in color made of strong soda lime glass with wavelength matched to the LED lamps.
  - e. Shall be U.L. listed for installation in a wet location.
  - f. Medium intensity lamps shall be L864 type flashing beacon and shall be coordinated to flash simultaneously.

2.11 STEEL TANK PAINTING:

- E. See Section 09 90 00.

2.12 SOURCE QUALITY CONTROL:

A. Tests:

1. Review mill test certifications of all steel plate, structural components and reinforcement to ensure compliance with specification requirements.

B. Inspections:

1. Provide inspection of shop fabricated components in accordance with AWWA D107.

PART 3 - EXECUTION

3.01 FOUNDATION:

A. Excavation:

1. The foundation bearing surface and excavation shall be inspected by a representative of the geotechnical engineer prior to foundation construction. Verification of the applicable design and construction recommendations is required. The geotechnical engineer shall be retained by the Contractor.

B. Concrete Construction:

1. For foundations, reinforcement placed adjacent to a concrete working slab shall have a 2 in. minimum cover, and shall be supported by precast concrete block, metal or plastic bar supports.
2. The sides of foundations shall be formed using any suitable system conforming to ACI 318. Earth cuts shall not be used as forms for vertical surfaces. Forms shall be provided on top sloping surfaces steeper than 2.5 horizontal to 1 vertical. Straight form panels may be used to form circular foundation shapes. The minimum design radius shall be maintained at all sections.
3. Concrete shall not be placed during precipitation or extreme temperatures unless protection is provided.

4. During cold weather the recommendations of ACI 306 shall be followed.
  5. During hot weather the recommendations of ACI 305 shall be followed.
- C. Finish:
1. Formed surfaces shall have a smooth form finish when exposed and a rough form finish when not exposed.
  2. Unformed surfaces shall have a troweled finish when exposed and floated finish when not exposed.

3.02 CONCRETE SUPPORT STRUCTURE:

- A. Architectural Concrete Construction:
1. The exposed exterior surface of the concrete support wall is designated architectural concrete. The concrete and formwork requirements of this section shall be strictly enforced to ensure concrete of the highest practicable structural and architectural standard. Concrete proportioning, placing, and finishing shall be in accordance with the ACI 301, Chapter 18, except as modified by this Section. Formwork design, installation, and removal shall comply with the minimum requirements of ACI 318, ACI 117 and the applicable requirements of ACI 347, except as modified by this Section.
  2. Attention shall be given to ensure the same concrete design mix is used throughout the support wall. The proportion, type and source of cement and aggregates shall not be changed. Uniform moisture content and placing consistency shall be maintained.
  3. Drop chutes shall be used in all wall concreting operations. Concrete shall be placed directly between reinforcement layers to prevent aggregate segregation and form splatter with the resulting surface finish variations.
  4. Support wall reinforcement shall be installed with plastic supports. Maximum spacing of supports for welded wire fabric shall be 5 ft. centers, horizontal and vertically.
  5. Forming systems shall be designed with the provision of ties and bracing such that concrete components conform to the correct dimensions, shape, alignment and elevation. Embedded items shall be properly positioned and secured. Form surfaces shall be thoroughly cleaned of concrete residue and coated with a release agent prior to placing reinforcement. Do not allow excessive release agent to accumulate on the form. Steel forms shall be coated with a non-staining rust preventative form oil or otherwise protected. Rust stained steel formwork shall not be used.
  6. The forming system for the pedestal wall shall be fully engineered and detailed with procedures to meet the increased demands of architectural concrete. The support wall shall be constructed with a jump form process using form segments prefabricated to match the wall curvature. Concrete pour height shall be a minimum of 4 ft. and a maximum of 12 ft. Form panels shall extend the full height of the concrete pour using only vertical panel joints. Form system shall be designed to lap and be secured to the previous wall pour. The space between the form and the previous pour shall be sealed to prevent grout leakage. Wall forms shall incorporate a positive means of adjustment to maintain dimensional tolerances specified. Wall forms shall be adjusted for vertical plumb and circularity and locked into position with through wall form ties prior to concrete placement. Panels shall be designed for lateral pressures associated with full height plastic concrete head, and support and bracing shall be provided for construction related impact loads and wind loads. Working platforms that allow safe access for inspection and concrete placement shall be provided. Form surfaces shall be steel, plastic or fiberglass coated material.
  7. The form system shall incorporate a uniform pattern of vertical and horizontal rustications to provide architectural relief to the exterior wall surface. Rustication strips shall be sealed to the form face to eliminate the grout leakage that results in broken corners, color variations and rock pockets. Broken edges and chamfers will not be

accepted. All construction joints and panel joints shall be located in rustications. Vertical panel joints shall be sealed using closures which combine with the form pattern to eliminate grout leakage and panel joint lines. All joints shall be grout tight. The vertical and horizontal rustications shall be proportioned and combined to impart a symmetrical architectural pattern to the completed structure. Form ties shall be located in a uniform pattern. No architectural form treatment is required on the interior surface.

8. Support wall concreting shall incorporate segmented placement procedures. Temporary vertical bulkheads shall divide the wall pour into segments corresponding to a single batch (truckload) of concrete. The bulkheads shall be located at rustications, braced rigid and tight to maintain vertical alignment under concrete load without grout leakage. Wall segment concrete shall be placed continuously to full form height from a single load. Placement from multiple batches is not permitted. Temporary bulkheads shall not be removed until adjacent concrete is placed. Support wall concreting operations shall occur a maximum of once per day. Multiple form movements and concrete placements within a day are not permitted.
  9. Wall forms shall not be disturbed or removed until the concrete has attained sufficient strength to prevent forming operations or environmental loads from causing surface damage or excessive stress. Form removal shall be based on early age concrete strength testing. The minimum concrete strength shall be established by the Contractor, based on an analysis of stress at critical stages throughout the forming and concrete operations. Early age concrete testing shall be in accordance with ACI 228.1R-89. Pull Out testing in accordance with ASTM C 900-99, Maturity Method testing in accordance with ASTM C 1074-93, or field cured cylinders compressive strength tested in accordance with ASTM C 172 are the acceptable methods to determine early concrete strength.
  10. The formwork system for the domed structural floor shall be designed to support all construction loads. Adequate shoring and bracing shall be provided to transfer loads without appreciable movements. Form surfaces shall be steel, plastic or fiberglass coated material. Shoring and forms for the structural dome slab shall remain in place until the concrete has gained sufficient strength to carry the floor weight without damaging deflections.
  11. Concrete surfaces shall be protected in accordance with the recommendations of ACI 306 until the component attains 35% of the specified compressive strength. At this time, protection may be removed subject to the allowable temperature differential. A reasonable temperature differential shall be defined, based on component thickness and restraint conditions.
- B. Finish:
1. Provide a smooth form finish without rub for the interior and exterior support wall. Tie holes shall be plugged using grout on the interior and manufactured plugs on the exterior which match the color of the cured concrete as closely as possible. Provide a light sandblast of the exterior concrete support wall surface which shall be identified on the Bid Form as the following.
  2. Provide a smooth form finish without rub for the interior dome slab. The unformed surface shall have a floated finish.
- C. Dimensional Tolerances:
1. Support structure concrete construction shall conform to the following:
    - a. Variation in thickness:
      - (1) Wall - 3.0% to +5.0%.
      - (2) Dome - 6.0% to +10%.
    - b. Support wall variation from plumb:
      - (1) In any 5 feet of height - 3/8 inch.
      - (2) In any 50 feet of height - 1 inch.

- (3) Maximum in total height - 2 inches.
  - c. Support wall diameter variation - 0.4%.
    - (1) Not to exceed - 3 inches.
  - d. Dome floor radius variation - 1.0%.
  - e. Level alignment variation:
    - (1) From specified elevation - 1 inch.
    - (2) From horizontal plane - 1/2 inch.
  - f. Offset between adjacent pieces of formwork:
    - (1) Exterior exposed surfaces - 1/8 inch.
    - (2) Interior exposed surfaces - 1/4 inch.
- D. Mock-up Panel:
  - 1. A mock-up panel shall be constructed using the proposed form work, concrete, and placement methods. Minimum size will be 4 ft wide by 4 ft high. This panel shall be inspected by the Engineer and agreed upon by the Contractor and Engineer as the reference standard with which to judge surface quality, appearance and uniformity of texture and color.
  - 2. Review and acceptance of formed concrete surface must be made immediately upon form removal. The Contractor shall be responsible to inform the Engineer as to pour schedule. The Engineer shall not delay the Contractor by lack of attendance. Non-attendance by the Engineer will be understood by the Contractor to mean acceptance of the lift by the Engineer.
  - 3. Concrete with surface defects exceeding limitations specified herein or not meeting the standard represented by the mock-up panel shall be repaired to meet that standard or removed.
  - 4. Mock-up panel shall not be incorporated into the construction of project. Work shall not begin until Engineer has inspected and approved panel. Panel shall not be removed from site until all work on tank(s) is completed.
- E. Steel Tank Mock-up Panel:
  - 1. A mock-up of the steel tank shall be constructed in the field to represent the welds and the NACE surface preparation for painting.
  - 2. Weld mock-up:
    - a. Weld mock-up shall be representative of weld procedure, processes, filler material, surface preparation intended to be used on the project.
    - b. Sample panel shall be inspected by the Owner, Engineer, and independent testing firm, and will be agreed upon by the Contractor and Engineer as the representative sample for structural weld quality and surface preparation. The sample panel shall serve to establish acceptability of, but not be limited to, the following:
      - (1) Single and double welded joints.
      - (2) Full and partial penetrations.
      - (3) Butt and lap joint welds.
      - (4) Fillets and seal welds.
      - (5) Vertical, horizontal, overhead, intersection, offset, and angular joints.
      - (6) Repairs for excessive gaps, offsets, and misalignments.
      - (7) Allowable out-of-tolerance joint repairs.
      - (8) Heat tint.
      - (9) Weld splatter.
      - (10) Weld surface ripples.
      - (11) Height of reinforcement.
      - (12) Blending of weld material with parent material.
  - 3. Coating mock-up:

- a. Sample panel will be used to establish acceptable surface preparation and paint appearance.
  - b. On the first day of sand blasting surface preparations, tank manufacturer shall blast metal sample panel interior and exterior steel surfaces to the standard specified in Section 09 90 00.
  - c. Following inspection of metal sample panel by Engineer, Owner, and Contractor, the panel shall be coated with clear non-coloring finish for use as reference throughout blasting operations.
4. Mock-up panel shall not be incorporated into the construction of project. Work shall not begin until Engineer has inspected and approved panel. Panel shall not be removed from site until all work on tank(s) is completed.

3.03 STEEL TANKS:

- A. Welding:
1. Welding procedures and general welding requirements shall be in accordance with AWWA D107, Section 9.5, "Welding".
  2. No structural welding is permitted to any steel embedded in hardened concrete, unless the weld is at least 2 ft. from the embedment interface.
  3. Grinding of weld contour shall approximate Condition "D" of NACE Standard RP0178.
- B. Fabrication:
1. Layout, cutting, forming, edge preparation, and workmanship for steel tank components and fabrications shall be in accordance with AWWA D107, Section 5.4, "Fabrication and Construction Requirements".
- C. Tank Erection:
1. Steel tank erection procedures and general requirements shall be in accordance with AWWA D107, Section 5.4, "Fabrication and Construction Requirements".
  2. All miscellaneous anchors or attachments used for tank erection shall be removed and the remaining projections shall be ground smooth.
- D. Tolerances:
1. Design shall be in accordance with AWWA D107.
- E. Grouting:
1. Where liner plate does not conform to the supporting concrete dome the interface between the steel tank floor plate and the supporting structural concrete slab shall be constructed with a minimum 1 in. void. Subsequent to testing, the void shall be filled with a flowable grout mix.

3.04 FIELD QUALITY CONTROL:

- A. Concrete Testing and Inspection:
1. Owner shall furnish test equipment, test cylinder molds, and certified personnel to perform all required field tests, make the required concrete test cylinders, and deliver test cylinders to the testing laboratory. The prescribed tests shall be made in the presence of or with the concurrence of Owner.
  2. Test Concrete and make test cylinders conforming to ASTM C31, C143, and C172. Samples shall be taken at random at the point of truck discharge.
  3. Perform slump and air content tests throughout any placement as required to maintain constant quality of fresh concrete, and when directed by Engineer.
  4. Field testing personnel shall remain on Site throughout placement of concrete.
  5. Make not less than four test cylinders for each 100 cubic yards of concrete or fraction thereof for each day concrete is placed. Deliver to testing laboratory within 24 hours after taking cylinders.
  6. Laboratory Testing:

SECTION 33 16 11 – COMPOSITE ELEVATED WATER STORAGE TANKS: continued

- a. An independent testing laboratory shall be selected and paid by Owner to perform the required laboratory tests.
  - b. Laboratory shall cure cylinders conforming to ASTM C192.
  - c. Cylinders shall be tested conforming to ASTM C39. Average strength of two cylinders shall be used as result of test. Test two cylinders at 7 days and two at 28 days.
7. Low Strength Concrete:
- a. Defined as concrete whose 7-day strength is less than 70% of the specified minimum 28-day strength.
  - b. Concrete shall remain accessible with no other Work performed that relates to or depends upon the questionable concrete until a final decision as to the disposition of the concrete is given by Engineer.
  - c. Low-strength concrete shall be removed and replaced if requested by Engineer.
8. The support wall radius, plumb and thickness shall be verified for each concrete lift at 45-degree intervals. Vertical alignment and radius shall be checked using a visible beam laser. Daily measurements shall be provided to resident inspector. An inspection report certified by the tank designer shall be provided to the Owner at project completion.
- B. Steel Tank Testing & Inspection:
1. Inspection procedures for the steel tank shall be as required by AWWA D100, Section 11, "Inspection and Testing". Radiographic inspection of full penetration butt-welded joints shall be made by the Owner.
  2. Erection tolerance of the steel cone in the radial direction shall be measured. Provide field measurements at 30-degree intervals.
  3. Weld joints of plate over the structural concrete floor shall be tested for leaks by vacuum box / soap solution testing, or equivalent method prior to grouting.
- 3.05 LEAKAGE TEST:
- A. See Section 33 01 10.59.
- 3.06 CLEANING:
- A. Site:
1. The project site shall be kept in a clean and safe condition at all times. The Contractor shall remove all construction equipment and debris at project completion.
- B. Tank Disinfection:
1. See Section 33 01 10.59.

END OF SECTION 33 16 11.

## SECTION 33 16 96 – RESERVOIR HYDRODYNAMIC MIXING SYSTEM

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. The Hydrodynamic Mixing System (HMS) is defined as a supplemental system installed within the potable water elevated storage tank which passively utilizes the energy provided by the inlet water supply and generates a sufficient inlet momentum to achieve a blending of the water volume within the reservoir with the inlet supply flow.
- B. Blending shall be defined by the modeling requirements and supporting hydraulic analysis as conducted by each individual manufacturer for their specific system configuration as defined within this specification. System submittals not providing this validation shall not be considered as a viable HMS. Modeling and calculations provided by parties other than the duckbill valve manufacturer are not allowed.
- C. This specification includes all components of the HMS consisting of a uni-directional flow manifold equipped with variable orifice inlet nozzles that are NSF61 certified. The HMS manufacturer shall be responsible for designing the system in accordance with the hydrodynamic criteria defined within this specification and submit design calculations verifying compliance in accordance with the submittal requirements.
- D. The complete Hydrodynamic Mixing System shall be supplied by the variable orifice nozzle manufacturer to maintain single source responsibility for the system. The complete system shall be defined as all piping and appurtenances within the tank downstream of the tank penetration. Appurtenances include pipe, fittings, expansion joints, variable orifice duckbill check valves, and any other equipment specified within this section of the specifications.
- E. Related Work Specified Elsewhere
  1. Submittals: Section 01340.
  2. Cleaning, Disinfection, and Leakage Testing: Section 33 01 10.59.
  3. Utility Valves and Accessories: Section 33 12 16.
  4. Composite Elevated Water Storage Tanks: Section 33 16 11.

#### 1.02 REFERENCED:

- A. Applicable Standards:
  1. American Society of Mechanical Engineers (ASME):
    - a. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
    - b. ASME B16.5 - Pipe Flanges and Flanged Fittings.
    - c. ASME B36.10 - Welded and Seamless Wrought Steel Pipe.
  2. ASTM International (ASTM):
    - a. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
    - b. ASTM A234 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
    - c. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
    - d. ASTM A351 - Standard Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts.
    - e. ASTM D1330 - Standard Specification for Rubber-Sheet Gaskets.
  3. American Water Works Association (AWWA):
    - a. AWWA C200 – Steel Water Pipe, 6 In. (150 mm) and Larger.
    - b. AWWA C207 - Steel Pipe Flanges for Waterworks Service, Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm)

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

- c. AWWA C220 – Stainless-Steel Pipe, 1/2 In. (13mm) and Larger.
  - 4. National Sanitation Foundation International (NSF):
    - a. NSF 61 - Drinking Water System Components - Health Effects.
    - b. NSF 372 – Drinking Water System Components – Lead Content.
- 1.03 SUBMITTALS:
  - A. Submit as specified in Division 1.
  - B. Independent Computational Fluid Dynamics (CFD) Modeling Validation: The mixing system designer/supplier must supply data or report from at least one project where an independent company conducted CFD modeling on their mixing system design and the modeling results verified the design achieved complete mixing.
  - C. Full Scale Tracer Study Validation: The mixing system designer/supplier must supply data or report from at least one project where a full scale tracer study was conducted on a circular reservoir and the tracer study results verified the mixing system design achieved complete mixing.
  - D. Inlet Nozzle Testing and Validation: Verification of independent hydraulic testing to determine headloss and jet velocity characteristics on size of valves used for the project under free discharge and submerged conditions.
  - E. Verification of independent hydraulic testing to determine headloss characteristics on valve sizes used for this project.
  - F. Verification of Finite Element Analysis (FEA) modeling on a perforated disc/elastomeric membrane check valve to determine stress and deflection characteristics under reverse differential pressure.
  - G. Validation of Long-term performance: The mixing system designer/supplier must supply at least one inspection report showing proper operation of, and no deterioration of, the duckbill valves after being in service in a water storage tank mixing application for a minimum of 10 years.
  - H. NSF Approval.
    - 1. Copy of the NSF61 Approved listing for the valves used in the HMS.
    - 2. NSF61 approved/certified materials will not be accepted in lieu of valve certification.
    - 3. All components of the HMS must conform to NSF 372, as applicable.
  - I. Test Report on Elastomer Exposure to Chlorine and Chloramine:
    - 1. Copy of test report from an accredited laboratory with confirmation of no degradation in the duckbill valve elastomer when exposed to chlorine and chloramine per the ASTM D471-98 "Standard Test Method for Rubber Property - Effect of Liquids."
  - J. System Installation Drawings:
    - 1. The HMS manufacturer shall be responsible for providing drawings of the complete manifold piping system. Drawings shall include plan view piping arrangement, sections and elevations as required, support bracket installation details, duckbill nozzle orientation details and all dimensions required for locating the system within the specified dimensions of the tank.
  - K. Design Calculations.
    - 1. All Design Calculations, curves, and reference information listed below must be submitted by HMS system supplier.
    - 2. Calculations showing the fill time required, under isothermal conditions, for the HMS system to achieve complete mix of the reservoir volume at minimum, average and peak fill rates. Complete mixing defined as 95% homogenous solution. The theory and equations used in calculating the mixing times must be from a published AWWA

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

- reference manual or paper. The reference document(s) must be submitted with the equations and calculations.
3. Calculations showing the water level drawdown required to achieve complete mixing on the fill cycles at minimum, average, and peak flow rates.
  4. Calculations of average storage tank water age for fill-then-draw scenarios. Theory used in calculating water age must be submitted with the calculations.
  5. A representative CFD model evaluation of the proposed HMS system configuration applied within the reservoir geometry. Model output documentation shall include all design variables applied for the simulation, plot of the 3-D geometry showing the mesh definition, velocity magnitude vector and contour plots at different cross-sections throughout the water volume, simulated tracer animations showing the spatial and temporal distribution of inlet water in real time during the fill cycle. CFD modeling shall be performed for average and peak flow rates.
    - a. A CFD model of operating and physical conditions not representative of the tank size and capturing the flow requirements for this project will not be accepted. If a representative CFD model is not available the supplier of the tank mixing system shall complete a new model for this project meeting the conditions stated above.
    - b. Each CFD modeling operating scenario shall be simulated for two drawdown/fill cycles:
      - (1) Scenario No. 1 – Fill from Normal Operating Low Water to Normal Operating High Water Levels with the influent water and tank contents each at a temperature of 90 degrees Fahrenheit.
      - (2) Scenario No. 2 – Fill from Normal Operating Low Water to Normal Operating High Water Levels with the influent water temperature at 90 degrees Fahrenheit and the temperature of the tank contents at 80 degrees Fahrenheit.
      - (3) Scenario No. 3 – Fill from Normal Operating Low Water to Normal Operating High Water Levels with the influent water temperature and tank contents each at a temperature of 35 degrees.
      - (4) Scenario No. 4 – Fill from Normal Operating Low Water to Normal Operating High Water Level with influent water temperature of 35 degrees Fahrenheit and the temperature of the tank contents at 45 degrees Fahrenheit.
    - c. HMS Manufacturer to coordinate high and low operating levels with Tank Manufacturer.
  6. Hydraulic calculations showing the resulting jet velocities of each inlet nozzle at minimum, average, and peak fill rates.
  7. Hydraulic calculations showing the flow distribution among all inlet ports at minimum, average, and peak fill rates.
  8. Manifold hydraulic calculations showing the total headloss of the HMS at minimum, average, and peak fill and draw rates. Headloss shall include all minor losses and headloss of nozzles.
  9. Hydraulic curves showing thrust vs. flow for the inlet nozzles.
  10. Calculations showing the terminal rise height of the jets that discharge at an angle above horizontal. The terminal rise height shall be calculated assuming 10°F and 20°F colder inlet water and calculated at minimum, average and peak fill rates. The theory and equations used to calculate the terminal rise height shall be included.
  11. Hydraulic curves for each inlet nozzle of Densimetric Froude number vs. flow.
- L. A report of the CFD modeling shall be submitted to Engineer for review and approval. The report shall include:

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

1. Operating parameters.
  2. Design summary listing all assumptions.
  3. HMS and Elevated Tank drawings.
  4. CFD modeling results and analysis.
  5. Influent headloss (in feet of water) shall be identified for each operating scenario.
- M. Installation, Operation and Maintenance Manuals as required in Section 01340 and below.
1. Copy of design calculations for the manifold system as defined in the previous section.
  2. Copy of complete set of the installation plans.
  3. Copy of NSF61 Certified Listing for the valves.
  4. Parts and equipment list with specification numbers for ordering of replacement parts.
  5. Product specification sheets for nozzles, concrete anchors, and any other specialized items supplied with the system.
  6. Installation guidelines for the HMS manifold system.
  7. Operational procedures for the HMS manifold system.
  8. Guidelines for repair and/or replacement of system components.
  9. Schedule for suggested periodic maintenance of the manifold system.
- N. Submit the following for acceptance prior to fabrication of the pipe:
1. Pipe and joint details.
  2. Special, fitting, and coupling details.
  3. Laying and installation schedule.
  4. Specifications, data sheets, and affidavits of compliance for protective shop coatings and linings.
- O. Certificates and Affidavits: Furnish the Following Prior to Shipment:
1. Affidavit of compliance with applicable standard.
  2. Test certificates.
- 1.04 QUALITY ASSURANCE:
- A. Manufacturers shall be experienced in the design and manufacture HMS, including all “duckbill” style elastomeric valves and appurtenances for a minimum period of five (5) years.
  - B. Manufacturer must have conducted in-house backpressure testing on duckbill valves.
  - C. Manufacturer must have duckbill valves installed on manifold piping systems in at least 25 distribution system reservoirs.
  - D. Manufacturer must have representative inspection videos showing the duckbill valves discharging water into the reservoir during an initial fill (unsubmerged). Manufacturer must also have representative underwater inspection videos showing the operation of the valves when submerged. Representative videos can be submitted upon request by Engineer.
  - E. Manufacturer shall have conducted hydraulic testing to determine headloss and jet velocity characteristics on the sizes of duckbill valve used for this project. The testing must include multiple constructions (stiffness) within each size and must have been conducted for free discharge (discharge to atmosphere) and submerged conditions.
  - F. Manufacturer shall have conducted a hydraulic test where multiple valves (a minimum of four) of the same size and construction (stiffness) were tested to validate the submitted headloss characteristics and to prove the repeatability of the manufacturing process to produce the same hydraulic characteristics.
  - G. Manufacturer shall have conducted hydraulic testing to study the flow distribution characteristics of duckbill valves installed on multiport manifolds.
  - H. Manufacturer to have conducted Finite Element Analysis (FEA) on various duckbill valves to determine deflection, stress, and strain characteristics under various load conditions. Modeling

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

must have been done for flowing conditions (positive differential pressure) and reverse differential pressure.

- I. The elastomer used in construction of the duckbill valves must have been tested by an accredited independent laboratory that confirmed there is no degradation in the elastomer when exposed to chlorine and chloramine per the ASTM D471-98 "Standard Test Method for Rubber Property - Effect of Liquids."
- J. Computational Fluid Dynamics (CFD) Modeling Validation:
  - 1. The professional performing the CFD shall have a minimum of 5 years of experience performing CFD modeling, or the professional performing the CFD modeling shall have a minimum of 5 years experience performing CFD modeling and shall be supervised by a registered Professional.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Acceptable manufacturers include those regularly engaged in passive mixing tank mixing systems with a history of successful installations in the United States.
  - 1. Tideflex Technologies, Carnegie, PA.
  - 2. Landmark Structures, LP.
  - 3. Engineer Approved Equal.
- B. Manufacturer's submitting as an approved equal shall be responsible for obtaining any and all proprietary rights, license fees, royalties, technology licenses, and/or and permissions required to provide such a system. The Manufacturer shall indemnify and hold harmless Owner and Engineer against all claims, damages, losses, and expenses arising out of any infringement of patent rights or copyrights incident relating to this system.

2.02 DESIGN CRITERIA:

- A. The following parameters apply to the HMS equipment:
  - 1. Separate inlet and outlet penetrations for the tank, which operates in a fill-and-draw manner.
  - 2. One manifold pipe with variable orifice inlet nozzles.
  - 3. HMS shall provide passive operating which is defined as not requiring any outside energy source.
  - 4. Utilize existing differential pressure between the inlet pressure and tank head to fill the reservoir thru the inlet nozzles and draw fluid from the tank through the outlet.
  - 5. Achieve complete mixing via multiple turbulent inlet jets.
  - 6. Variable orifice inlet nozzles shall provide a non-linear jet velocity versus flow characteristic that maximizes the inlet momentum at all flow rates.
  - 7. Inlet ports shall discharge an elliptically shaped jet.
  - 8. The inlet port configuration shall be based on Computational Fluid Dynamics (CFD) modeling, conducted by the manufacturer, of a similar configuration in the same tank style.
  - 9. Related Tank Information:
    - a. General:
      - (1) Installation: New.
      - (2) Quantity: One (1).
        - (a) New 3.0 MG Tank.
      - (3) Location: Distribution system.
      - (4) Mode: Fill-and-draw.

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

- (5) High Water Level Shutoff: Altitude valve.
- (6) Water Source: Surface water.
- (7) Primary Disinfection: Free chlorine.
- (8) Secondary Disinfection: Chloramines.
- b. New 3.0 MG Tank:
  - (1) Tank Data:
    - (a) Shape: Circular.
    - (b) Composite Elevated Tank.
    - (c) Volume: 3.0 MG.
    - (d) Bowl Diameter: 112 ft (+/- 4 ft.).
    - (e) Depth to Maximum Operating Level: 47.5 ft (+/- 2.5 ft).
    - (f) Depth to Overflow: Depth to Maximum Operating Level plus 1-ft.
    - (g) Maximum Operating Level Elevation: 1160 ft.
    - (h) Tank Material/Construction: Elevated steel tank on concrete pedestal.
    - (i) 30-inch riser pipe (common inlet, outlet, drain).
  - (2) Tank Hydraulics:
    - (a) Minimum Fill Rate: approx. 0 gpm.
    - (b) Average Fill Rate: 1750 gpm.
    - (c) Maximum Fill Rate: 8333 gpm.
  - (3) The maximum allowable headloss through the HMS shall be as follows:
    - (a) Headloss (ft H<sub>2</sub>O) at maximum fill rate: 2 ft.

2.03 VARIABLE ORIFICE DUCKBILL INLET NOZZLES:

- A. Inlet ports/nozzles shall be duckbill-style check valves that allow fluid to enter the tank during fill cycles and prevent flow in the reverse direction through the nozzle during draw periods. Inlet ports/nozzles shall not be fixed-diameter ports or pipes.
- B. The duckbill valves shall be NSF61 Certified. NSF61 approved/Certified materials will not be accepted in lieu of valve certification.
- C. Inlet ports/nozzles shall have a variable diameter versus flow hydraulic profile that provides a non-linear jet velocity versus flow characteristic and a linear headloss versus flow characteristic. The hydraulic characteristics of the duckbill valves shall be defined by "Hydraulic Code".
- D. The inlet ports/nozzles shall discharge an elliptically shaped jet. Supporting documentation may be requested by Engineer including, but not limited to, certification of modeling conducted by a laboratory using Laser Induced Fluorescence (LIF) for the nozzle.
- E. The duckbill style nozzles shall be one-piece elastomer matrix with internal fabric reinforcing designed to produce the required discharge velocity and minimum headloss requirements. The flange portion shall be an integral portion of the nozzle with fabric reinforcing spanning across the joint between the flange and nozzle body.
- F. The Manufacturer's name, plant location, serial number and product part number which designates nozzle size, material and construction specifications shall be bonded onto the surface of the nozzle.

2.04 STAINLESS STEEL PIPE AND FITTINGS:

- A. All HMS piping shall be ASTM A240 Type 304L stainless steel.
  1. Provide isolation flange between tank inlet/outlet pipe and first connection to HMS piping.
- B. All piping required for the HMS shall be provided by the HMS manufacturer.
- C. See Section 33 11 00 for requirements.

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

- D. All flanges shall be plate ring flanges. Flange drilling pattern shall be in accordance with ANSI B16.1/B16.5 standards.
- E. Ring flanges shall be continuously welded on both sides.
- F. All shop welds shall be manually scrubbed or brushed with non-metallic pads or stainless steel wire brushes to remove weld discoloration. Welds to be chemically passivated with nitric or citric acid.
- G. Field welding of stainless steel pipe and fittings for the HMS will not be allowed unless approved by the Engineer.

2.05 FLANGE GASKETS:

- A. Flange gaskets shall be full-faced and shall be in accordance with ASTM D1330.
- B. Flange gasket drilling pattern shall conform to ANSI B16.1/B16.5.
- C. Flange gaskets shall be 1/8" thick.
- D. Gasket material shall be EPDM.
- E. Gaskets and components shall be NSF 61 product certified.

2.06 FASTENERS:

- A. Hex head bolts and nuts shall be stainless steel 304 conforming to ANSI/ASME B18.2.1 and ANSI/ASME B18.2.2.

2.07 PIPE SUPPORTS:

- A. All components of the bracket assembly shall be stainless steel 304 in accordance with the associated standards.
- B. The bracket assemblies shall consist of four components:
  - 1. A top-works weldment that consists of structural channel and angle iron. The TMS piping shall rest on the angle iron. The angle iron shall have predrilled holes for the U-bolt.
  - 2. U-bolt with four hex nuts.
  - 3. An 1/8" thick EPDM strip with a length equivalent to the circumference of the pipe. The strip shall be placed between the pipe and the angle iron and U-bolt.
- C. The channel of the top-works weldment shall be field fit and modified to the required length. The channel shall then be field welded to the base plate.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND MATERIAL HANDLING:

- A. Individual nozzles shall be packaged separately from the piping equipment.
- B. All flanges shall be protected by using plastic inserts or plank wood, pipe sections are to be fully supported to prevent pipe deflection or damage to fittings or connections.
- C. All equipment shall be shipped on pallets capable of fully supporting the pipe sections across their entire length. Pallets shall be accessible for forklift transport or strap and hoist means without causing any load to the pipe equipment.
- D. All stainless steel components shall be stored separately away from any carbon steel components or other materials that could stain or deface the stainless steel finish from run-off of oxidized ferrous materials.
- E. All pipe equipment shall be covered and stored in areas free from contact with construction site sediment erosion to prevent accumulation of materials within the pipe and fittings.

SECTION 33 16 96 - RESERVOIR HYDRODYNAMIC MIXING SYSTEM (HMS): continued

- F. Duckbill nozzles shall be protected from contact with rigid objects during handling and storage. The Contractor shall be responsible for replacing any duckbill nozzles or elastomeric components that are damaged after arrival on the site through installation and start-up of the system.
- G. Operation and Maintenance Manuals
  - 1. The manuals shall include, but is not limited to, the following information:
    - a. Submit as required in Section 01340.
    - b. Design calculations for the manifold system as defined in the previous section.
    - c. Complete set of the installation drawings.
    - d. Copy of NSF61 Certified Listing for the valves.
    - e. Parts and equipment list with specification numbers for ordering of replacement parts.
    - f. Product specification sheets for nozzles, concrete anchors, and any other specialized items supplied with the system.
    - g. Installation guidelines for the HMS manifold system.
    - h. Operational procedures for the HMS manifold system.
    - i. Guidelines for repair of system components.
    - j. Schedule for suggested periodic maintenance of the manifold system.

3.02 INSTALLATION:

- A. Installation of the manifold system shall be in accordance with the installation plans and guidelines provided by the HMS manufacturer and as specified in the installation section of the Installation, Operation, and Maintenance manual.

3.03 INSTALLATION INSPECTION AND START-UP TESTING PROCEDURES:

- A. The HMS manufacturer's authorized representative shall provide one (1) day inspection to verify that the system has been installed in accordance with the design specifications and installation drawings.
- B. Start-Up Flow Testing:
  - 1. Following installation of the complete manifold piping system, the Contractor shall open the upstream isolation valve to allow flow into the tank through the manifold system. The isolation valve must be opened slowly to prevent surge or over-pressurization of the manifold system. The isolation valve must be fully opened to inspect the flow characteristics of the manifold system.
  - 2. The Contractor and HMS representative shall visually inspect the entire piping system for leakage.
  - 3. The Contractor and factory representative shall visually inspect all of the inlet nozzles to ensure flow is being discharged into the tank through all nozzles.
  - 4. Contractor shall provide post-construction performance testing including, but not limited to, convergence of temperature and disinfectant residual within a recommended time frame by the HMS manufacturer at various depths and at various locations at the design flowrate.

END OF SECTION 33 16 96

## SECTION 33 31 50 - PIPE INSTALLATION

### PART 1 - GENERAL

#### 1.01 SUMMARY:

- A. This Section includes handling, installation and testing of pipe, fittings, specials, and appurtenances as indicated or specified.
- B. Related Work Specified Elsewhere:
  - 1. Pressure Pipe: Section 33 11 00.
  - 2. Utility Valves and Accessories: Section 33 12 16.
  - 3. Protective Coatings: Section 09 90 00.

#### 1.02 REFERENCES:

- B. Applicable Standards:
  - 1. American Water Works Association (AWWA):
    - a. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
    - b. AWWA C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In. (100 mm) and Larger - Shop Applied.
    - c. AWWA C206 - Field Welding of Steel Water Pipe.
    - d. AWWA C209 – Tape Coatings for Steel Water Pipe and Fittings.
    - e. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.
    - f. AWWA C651- Disinfecting Water Mains.
    - g. AWWA M11 - Steel Pipe: A Guide for Design and Installation.
    - h. AWWA M23 – PVC Pipe – Design and Installation.
  - 2. Federal Specifications (FS):
    - a. FS SS-S-00210 - Sealing Compound, Preformed Plastic, For Expansion Joints and Pipe Joints.
  - 3. National Sanitation Foundation International (NSF):
    - a. NSF 61 – Drinking Water System Components – Health Effects.
    - b. NSF 372 – Reduction of Lead in Drinking Water Act (2014).

#### 1.03 DELIVERY, STORAGE AND HANDLING:

- B. Delivery, storage and handling shall be as specified in Division 1.
- C. Handle in a manner to ensure installation in sound and undamaged condition.
  - 1. Do not drop or bump.
  - 2. Use slings, lifting lugs, hooks, and other devices designed to protect pipe, joint elements, linings, and coatings.
- D. Ship, move, and store with provisions to prevent movement or shock contact with adjacent units.
- E. Handle with equipment capable of work with adequate factor of safety against overturning or other unsafe procedures.

PART 2 - PRODUCTS - Specified in respective Sections, this Division.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION - GENERAL:

- A. Use equipment, methods, and materials ensuring installation to lines and grades indicated.
  - 1. Maintain within tolerances specified or acceptable laying schedule.
    - a. Alignment:  $\pm 1$  inch per 100 feet in open cut or tunnel.
    - b. Grade:  $\pm 1$  inch per 100 feet.

SECTION 33 31 50 - PIPE INSTALLATION: continued

2. Do not lay on blocks unless pipe is to receive total concrete encasement.
  3. Accomplish horizontal and vertical curve alignments with bends, bevels, and joint deflections.
    - a. Limit interior joint opening in concrete pipe except for open side on deflected joints to:
      - (1) 3/8-inch in laying schedule.
      - (2) 1/2-inch in actual installation.
    - b. Limit joint deflection with ductile-iron pipe to conform to AWWA C600. Deflection may, with approval, exceed standard deflections by using machined bells.
    - c. Limit joint deflection in steel pipe as defined within AWWA M11.
    - d. Limit joint deflection in PVC pipe as defined within AWWA M23.
    - e. Use short specials preceding curves as required.
  4. Obtain acceptance of method proposed for transfer of line and grade from control to the Work.
- B. Install pipe of size, materials, strength class, and joint type with embedment indicated or specified for plan location.
- C. Insofar as possible, commence laying at downstream end of line and install pipe with bell ends in direction of laying. Obtain Engineer approval for deviations therefrom.
- D. Clean interior of all pipe, fittings, and joints prior to installation. Exclude entrance of foreign matter during installation and at discontinuance of installation.
1. Close open ends of pipe with snug-fitting closures. Install temporary plug at end of each day.
  2. Do not let water fill trench. Include provisions to prevent flotation should water control measures prove inadequate.
  3. Remove water, sand, mud, and other undesirable materials from trench before removal of end cap.
- E. Brace or anchor as required to prevent displacement after establishing final position.
- F. Perform only when weather and trench conditions are suitable. Do not lay in water.
- G. Observe extra precaution when hazardous atmospheres might be encountered.

3.02 JOINTING:

- B. General Requirements:
1. Locate joint to provide for differential movement at changes in type of pipe embedment, impervious trench checks, and structures.
    - b. Not more than 8 inches from structure wall, or
    - c. Support pipe from wall to first joint with concrete cradle structurally continuous with base slab or footing.
    - d. As indicated.
  2. Perform in conformance with manufacturer's recommendations.
  3. Clean and lubricate all joint and gasket surfaces with NSF 61 certified lubricant, as recommended.
  4. Use methods and equipment capable of fully seating or making up joints without damage.
  5. Check joint opening and deflection for specification limits.
- C. Special Provisions for Jointing Ductile-Iron Pipe:
1. Conform to AWWA C600.
  2. Visually examine while suspended and before installing.

SECTION 33 31 50 - PIPE INSTALLATION: continued

- a. Paint bell, spigot, or other suspected portions with turpentine and dust with cement to check for cracks invisible to the eye.
- b. Remove turpentine and cement by washing when test is satisfactorily completed.
- D. Special Provisions for Jointing Steel Pressure Pipe:
  - 1. Conform to AWWA M11.
  - 2. Check for holidays in coating and make repairs as required.
  - 3. Weld pipe and fittings to conform to AWWA C206. Welding shall be inspected as specified in Section 33 11 00.
  - 4. High-temp shrink wrap shall be installed as specified in Section 33 11 00 if interior welds are performed.

3.03 ELECTRICAL BONDING AND INSULATION:

- B. Use materials specified in Section 33 11 00 applied to conform to manufacturer's instructions.
- C. Install insulated joints of dielectric materials.
  - 1. Between dissimilar materials which could cause galvanic action. Ductile iron pipe and steel pipe are considered dissimilar materials. Carbon steel and stainless steel are considered dissimilar materials.
- D. Conform to manufacturer's instructions.

3.04 CLOSURE PIECES:

- B. Connect two segments of pipeline or a pipeline segment and existing structure with short sections of pipe fabricated for the purpose.
- C. Observe Specifications regarding location of joints, type of joints, and pipe materials and strength classifications.
- D. Field-fabricated closures, where required, shall be concrete encased between adjacent flexible joints.
- E. May be accomplished with sleeve coupling:
  - 1. Of length such that gaskets are not less than 3 inches from pipe ends.
  - 2. Wrap exterior of buried couplings with polyethylene encasement conforming to AWWA C105 or wrap exterior of buried couplings with cold tape coating conforming to AWWA C209.

3.05 POLYETHYLENE ENCASEMENT:

- B. Encase pipe, fittings, valves, and other appurtenances with polyethylene film as indicated or specified.
- C. Materials:
  - 1. Polyethylene encasement materials LLD-12 mil or HDCL-4 mil shall be as follows:
    - b. Conform to AWWA C105.
    - c. Conform to ASTM D4976
    - d. LLD-12 mil polywrap shall be blue.
    - e. LLD-12 mil polywrap shall conform to the following requirements beyond the listed minimum values in AWWA C105:
      - (1) Tensile Strength – 4400 psi.
      - (2) Elongation – 1000 percent.
      - (3) Dielectric Strength – 1900 v/mil.
      - (4) Tear Resistance – 4400 gf.
      - (5) Impact Resistance – 1100 g.
  - 2. Adhesive tape shall be as follows:

SECTION 33 31 50 - PIPE INSTALLATION: continued

- a. Approximately 50 mm (2 inches) wide and plastic backed.
  - b. Capable of bonding securely to metal surfaces and/or polyethylene material.
  - c. Polyken No. 900, Scotchrap No. 50, or Engineer-approved equal.
- D. Installation:
1. Perform to conform to AWWA C105.
  2. Use adhesive tape to fasten polyethylene film in place.
  3. Minimize exposure of polyethylene film to sunlight.
  4. Wrap pipe, valves, fittings, and couplings per AWWA C105 installation standards.
- 3.06 FIELD TESTING:
- B. Acceptance Tests for Pressure Pipelines:
1. Test separately in segments between sectionalizing valves, between a sectionalizing valve and a test plug, or between test plugs.
    - a. Select test segments such that adjustable seated valves are isolated for individual checking.
    - b. Contractor shall furnish and install test plugs.
      - (1) Including all anchors, braces, and other devices to withstand hydrostatic pressure on plugs.
      - (2) Be responsible for any damage to public or private property caused by failure of plugs.
  2. Limit fill rate of line to available venting capacity. Fill rate shall be regulated to limit velocity in lines when flowing full to not more than 0.05 to 1 fps.
  3. Owner shall make water for testing available to Contractor at nearest source. Contractor shall coordinate with Owner for use of water. Contractor shall notify Owner and Engineer a minimum of seven (7) working days prior to the performance of any field testing.
  4. Above Grade (Exposed) Piping Pressure and Leakage Test:
    - a. Submit written Test Plan a minimum of two weeks prior to testing. Obtain approval of equipment and acceptance of methods proposed for use.
    - b. Leakage test shall be conducted concurrently with the pressure test and shall consist of visible inspection of leaks.
    - c. Conduct initial test on piping within Valve Room.
    - d. Test remaining pipe in sections determined by Contractor and approved by Engineer.
    - e. Maintain test as necessary to locate all leaks but not less than two hours.
    - f. Repeat as necessary after repair of leaks and defects until all visual leakage has been eliminated.
    - g. Test pressures of pressure piping shall be as follows:
      - (1) Tank Inlet Riser: as specified in Section 33 11 00.
      - (2) Discharge Riser, and Overflow Pipe: Perform pressure testing and leakage observation when tank is filled to high water level (HWL).
    - h. Repeat test as necessary.
      - (1) After location of leaks and repair or replacement of defective joints, pipe, fittings, valves or hydrants. All visible leaks are to be repaired regardless of the amount of leakage.
      - (2) Until satisfactory performance of test.
    - i. Owner and/or Engineer will witness pressure and leakage test.
    - j. Pressure must not vary by more than 5 psi through the duration of testing for the pressure test to be considered successful.

SECTION 33 31 50 - PIPE INSTALLATION: continued

5. Below Grade (Buried) Piping Pressure and Leakage Test:
    - a. Perform hydrostatic pressure and leakage tests.
      - (1) Conform to AWWA C600 procedures.
        - (a) As modified herein.
        - (b) Shall apply to all pipe materials specified.
      - (2) Perform after backfilling.
    - b. Test separately in segments between sectionalizing valves, between a sectionalizing valve and a test plug, or between test plugs.
      - (1) Select test segments such that adjustable seated valves are isolated for individual checking.
      - (2) Contractor shall furnish and install test plugs.
        - (a) Including all anchors, braces, and other devices to withstand hydrostatic pressure on plugs.
        - (b) Be responsible for any damage to public or private property caused by failure of plugs.
    - c. Limit fill rate of line to available venting capacity. Fill rate shall be regulated to limit velocity in lines when flowing full to not more than 0.05 to 1 fps.
    - d. Owner shall make water for testing available to Contractor at nearest source.
    - e. Pressure and Leakage Test:
      - (1) Test pressure: as specified in Section 33 11 00.
      - (2) Leakage test shall be conducted concurrently with the pressure test.
      - (3) Pressure must not vary by more than 5 psi through the duration of testing for the pressure test to be considered successful.
    - f. Acceptable when leakage does not exceed that determined by the following formula:

$L = 0.000002 SD(P)^{1/2}$ , in which  
L = allowable leakage, in gallons per hour  
S = length of pipe tested, in feet  
D = nominal diameter of the pipe, in inches  
P = average actual leakage test pressure in psig
    - g. These formulas are based on an allowable leakage of 10.5 gpd/mile/in of nominal diameter of pipe.
    - h. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/hr/in of nominal valve size shall be allowed.
    - i. When hydrants are in the test section, the test shall be made against the main valve in the hydrant.
    - j. Repeat test as necessary.
      - (1) After location of leaks and repair or replacement of defective joints, pipe, fittings, valves or hydrants. All visible leaks are to be repaired regardless of the amount of leakage.
      - (2) Until satisfactory performance of test.
    - k. Owner and/or Engineer will witness pressure and leakage test.
- 3.07 DISINFECTION:
- B. Disinfection of Pipelines for Conveying Potable Water:
    1. Contractor shall provide all equipment and materials and perform conforming to AWWA C651.
      - a. As modified herein.

SECTION 33 31 50 - PIPE INSTALLATION: continued

- b. Include preliminary flushing, chlorination, and final flushing.
2. Minimum preliminary flushing rates shall produce 2.5 fps velocity in main (or as approved by Engineer):
  - a. Flush pipeline before use for potable water supply purposes.
3. Dispose of final flushing water without damage to public or private property.
4. Disinfection:
  - a. Contractor shall submit written Plan detailing disinfection method to be used and plans for treatment and disposal of wastewater for review and approval.
  - b. During disinfection, all valves shall be operated to ensure disinfection.
  - c. Contractor shall verify chlorine residual using drop dilution method per AWWA C651.
5. Contractor shall verify disposal method of chlorinated water with federal, state, and local agencies to ensure method is in compliance with any regulations of each applicable agency.
  - a. Contractor shall submit, for information only, proposed method for disposal and regulations which govern this disposal.
  - b. Contractor shall be responsible for all costs associated with disposal of the water including, but not limited to, testing, permits, chemicals and chemical metering equipment.
6. Owner will be responsible for all sampling and laboratory testing.
  - a. Bacteriological sampling and testing shall be performed in accordance with AWWA C651 Option A and EPA sampling and preservation techniques.
  - b. Samples shall be collected at least 24 hours apart.
  - c. A copy of the test results shall be submitted to the Engineer.
7. Repeat disinfection process should initial treatment fail to yield satisfactory results.
  - a. At no additional cost to Owner.

3.08 FIELD PAINTING: Specified in Section 09 90 00.

END OF SECTION 33 31 50

## DIVISION 40 – PROCESS INTEGRATION

### SECTION 40 60 00 – PROCESS CONTROLS AND INSTRUMENTATION – GENERAL REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 RELATED DOCUMENTS:

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

##### 1.02 SUMMARY:

- A. This Division includes instruments, control devices, control panels, computer hardware and system programming as specified in Sections 40 60 00 – 40 70 00.
- B. Related Work Specified Elsewhere:
  - 1. Interconnections and control of equipment: All applicable Divisions.

##### 1.03 RELATED REQUIREMENTS:

- A. Division 26: All applicable Sections.

##### 1.04 REFERENCES:

- A. Applicable Standards:
  - 1. National Fire Protection Association (NFPA):
    - a. 70 - National Electrical Code (NEC).
  - 2. Instrument Society of America (ISA).
    - a. S20 - Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.
  - 3. Others as specified in applicable Sections.

##### 1.05 SUBMITTALS:

- A. Submit as specified in DIVISION 01.
- B. Manufacturer with prime responsibility shall assume responsibility for all Compliance Submittals.
- C. Training Reports:
- D. As specified in each applicable Section, this Division.

##### 1.06 QUALITY ASSURANCE:

- A. The Contractor shall provide the services of a single System Integrator (SI), to provide the material, equipment, labor, and services specified in Sections 40 60 00 – 40 70 00. The SI shall be subcontracted and under the direct supervision of the Contractor. See below for a list of acceptable System Integrators.

SECTION 40 60 00 – PROCESS CONTROL AND INSTRUMENTATION – GENERAL REQUIREMENTS: continued

1.07 ACCEPTABLE SYSTEM INTEGRATORS (SI):

- A. The communication, instrument and control systems may use Equipment of different manufacturers, but the System Integrator Subcontractor shall assume prime responsibility for the complete instrumentation and control system.
- B. No Bidder shall be required to employ any Subcontractor, other person, or organization against whom Bidder has reasonable objection.
- C. The SI shall be one of the following companies:
  - 1. Custom Control
  - 2. R.E. Pedrotti
  - 3. AW Schultz
  - 4. Durkin Inc.
- D. If Contractor wishes to utilize a System Integrator not listed, it shall submit documentation for approval demonstrating the experience requirements of this article prior to bid opening. As a minimum the following information shall be submitted:
  - 1. Evidence of sufficient financial resources to perform the required work. This evidence may be in the form of a certified financial report for the latest fiscal year.
  - 2. Verification of all items listed under the system integrator qualifications paragraph.
  - 3. Name the key project staff who will be responsible for office engineering and project management; software configuration; field testing, calibration and start-up; and operator instruction and maintenance training. Include an organization chart of key project staff and detail availability of each staff assigned.
  - 4. Provide resumes of proposed key project staff that demonstrate project experience with the control system products specified for the project.
  - 5. Provide references for at least five (5) projects where the following tasks were performed by personnel directly employed by the firm as a SI; system engineering and documentation including panel assembly, schematics, and wiring diagrams; software configuration and documentation; field testing, calibration, and start-up; and operating instructions and maintenance training. Project references shall include contact information for owners and consulting engineers.

1.08 SYSTEM INTEGRATOR QUALIFICATIONS:

- A. The instrumentation, control and communications system shall be furnished by a System Integrator (SI) who shall assume responsibility for the satisfactory performance of the entire plant control system. Only those SI who can demonstrate that they possess the prerequisite capabilities and experience shall be considered. The System Integrator subcontractor must meet the following minimum criteria:
  - 1. The SI Company shall have been in business for a minimum of five (5) years performing SI work on water and wastewater treatment projects, and have control systems technicians with 5 years minimum experience with installation, testing, calibrating and startup of industrial control and automation systems.
  - 2. The SI Company shall have specific experience with the following:
    - a. Ethernet network setup and configuration.

SECTION 40 60 00 – PROCESS CONTROL AND INSTRUMENTATION – GENERAL REQUIREMENTS: continued

- b. Transdyn and iFIX human machine interface software.
  - c. Allen Bradley ControLogix programmable logic controllers (PLCs) and PLC Logix 5000 software.
  - d. Instrumentation setup and calibration.
3. The SI shall have a UL 508 authorized manufacturing facility.

1.09 TRAINING:

- A. The System Integrator shall provide formal training for operators, maintenance and service personnel.
- B. A training schedule and log shall be developed. The training schedule shall identify scheduled dates and times for all training sessions specified in this Division. The training log shall identify dates for training and record training session attendees.
- C. Training sessions shall be scheduled with the Owner a minimum of two weeks prior to occurrence and a training schedule shall be maintained and communicated to the Owner on a routine basis.
- D. Owner may videotape all on-Site training for future use. Any charges for this videotaping shall be included.
- E. Provide training as specified in each applicable Section, this Division.

PART 2 - PRODUCTS: Specified in DIVISION 40.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. The System Integrator shall be responsible for creating as-built PLC wiring drawings. Showing all new, removed, and existing field wiring to reflect as-left conditions.
  1. The drawing set shall be created in AutoCAD and the AutoCAD files shall be submitted to the Owner at the end of the project.
  2. A hard copy of the current as-built drawings for the PLC panel will be provided to the Contractor, Contractor shall be responsible for confirming all existing wiring.

3.02 FIELD TESTING - INSTRUMENT AND CONTROL SYSTEMS:

- A. General Requirements:
  1. Conform to requirements as specified in DIVISION 1.
  2. Conduct all tests in the presence of Engineer under the supervision of Equipment manufacturer's field engineer.
  3. Notify Engineer two weeks prior to the commencement of all tests.
  4. Include all tests recommended by the Equipment manufacturer unless specifically waived by Engineer.
  5. Include all additional tests recommended by Engineer that he deems necessary because of field conditions, to determine that Equipment and Materials and systems meet requirements of Contract Documents.
  6. Be responsible for all damage to Equipment and Materials due to improper test procedures or test apparatus handling.

SECTION 40 60 00 – PROCESS CONTROL AND INSTRUMENTATION – GENERAL  
REQUIREMENTS: continued

B. Test Reports:

1. Submit test reports as specified in DIVISION 1.
2. Maintain a written record of all tests showing date, personnel making tests, equipment or material tested, tests performed, and results.

3.03 COORDINATION AND SCHEDULING: Coordinate installation of Equipment and Materials with construction schedule.

END OF SECTION 40 60 00

SECTION 40 61 96 – PROCESS CONTROL SOFTWARE PROGRAMMING AND REPORTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes control descriptions and requirements for the PLC and HMI system programming.
- B. The System Integrator shall be responsible for all PLC and HMI system programming associated with the Prospect Elevated Tank.
- C. The System Integrator shall be responsible for configuring and establishing communication between the existing PLC and the new elevated tank remote I/O and control panel.
- D. The Owner will be responsible for updating existing and developing new HMI screens for the existing Transdyn system.
- E. The System Integrator shall support and coordinate with the Owner in the development of the existing Transdyn system.
- F. The System Integrator shall be responsible for submitting and maintaining throughout the project an end-to-end memory map excel spread sheet showing tag names in different devices, ranges and states.

1.02 SUBMITTALS:

- A. Submit as specified in DIVISION 01.
- B. Specific Submittals to be furnished shall include at least the following:
  - 1. A complete listing of all proposed HMI screens and the corresponding points and parameters that will be displayed on each screen. Existing HMI screens that will be modified shall be included with a description of what changes will be made.
  - 2. Three submittal stages for HMI screens for the project. Submit hard copy of HMI screens at the following stages:
    - a. Preliminary.
    - b. 90%.
    - c. Final.
  - 3. Description of power failure and restoration mode.
  - 4. Syllabus for Owner training sessions.
  - 5. Complete list of IP Addresses for all new network devices.
  - 6. Complete list of addresses and ranges for the points specified to be communicated with the existing SCADA system.
  - 7. Proposed standard PLC programming blocks for the project. Inputs and outputs that will be developed for each object shall be identified.
- C. Submit a system functional test procedure for use in system functional compliance testing.
- D. Provide O&M manuals in electronic and hardcopy format including as a minimum the above information and the following:
  - 1. DVD of all training sessions.
  - 2. Soft and hard copies of complete PLC program including all program comments.
  - 3. Soft and hard copies of all developed HMI screens.
  - 4. Spreadsheet referencing “end to end” addressing and tag names for any new information being passed through the control system.

SECTION 40 61 96 – PROCESS CONTROL SOFTWARE PROGRAMMING AND REPORTS:  
continued

5. Copies of all warranties and guarantees.
6. Emergency instructions.
7. Recommended spare parts list.
8. Maintenance procedures for routine preventive maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

1.03 PROGRAMMER QUALIFICATION:

- A. Programming shall be by a System Integrator specializing in PLC and HMI programming for the water/wastewater industry.
- B. The Programmer shall have experience on similar size facilities and projects.
- C. The Programmer shall be trained on the Rockwell Automation software specified for this project including Transdyn/iFix, RSLogix, RSLinx, and other applicable software packages.

1.04 TRAINING:

- A. The System Integrator shall provide formal training for operators, maintenance and service personnel.
- B. Handouts shall be provided for all participants that include a summary of information to be covered in the training sessions along with screen shots of the HMI screens as examples for control functions available from the operator workstation and SCADA system screens.
- C. The training session shall include classroom discussion on the theory of operation of the control system as well as maintenance and service methods for the system. Topics covered shall include functionality of the system, system navigation, data management, and recommended backup procedures.
- D. Operator Training Sessions:
  1. Prior to the startup of the new control system two, 2-hour hands on training sessions shall be provided to accommodate operators from all shifts. The training sessions shall clearly explain how to utilize the new system. HMI screens for the new system shall be presented and operators shall have the opportunity to utilize the new system in a demonstration mode and navigate all the screens. The training sessions shall also explain and demonstrate customized features such as alarm review and acknowledgment procedures.
- E. Maintenance and Service Personnel Training:
  1. Prior to the startup of the new control system a one day hands on training sessions shall be provided for all maintenance and service personnel. The training session shall include the following:
    - a. Clearly explain the architecture of the new system and explain how the network is configured and managed.
    - b. Cover all system software operation and configuration.
    - c. Cover HMI screen layout and functionality.
    - d. Introduce basic PLC programming and explain methods for troubleshooting and identifying system issues.
    - e. Cover system hardware and functionality.

SECTION 40 61 96 – PROCESS CONTROL SOFTWARE PROGRAMMING AND REPORTS:  
continued

- f. Cover I/O database management and modifications including how points are added to the control system and managed.
- g. Cover PLC programming layout and logic associated with the system. Programming logic shall be reviewed with the Owner and explanations shall be provided on programming methodologies and how the programs are organized and notated.
- h. Programming comments and documentation shall be reviewed with the Owner to provide a clear understanding of how the system functions.
- i. Additional topics as required to provide Owner with the ability to manage, troubleshoot, modify and maintain the control system.

1.05 MANUFACTURER'S FIELD SERVICES:

- A. The System Integrator shall provide the field services of a trained programmer for the required time to commission, test and start-up the control system.
- B. All travel and living expenses shall be included for all trips to the site. All equipment required for testing, start-up and performance verification shall be provided by the start-up technician.

PART 2 - PRODUCTS

- A. Not applicable.

PART 3 - EXECUTION

3.01 GENERAL:

- A. The intent of the control system modifications are to provide complete control and monitoring capabilities for systems associated with the addition of the 3MG elevated tank adjacent to the Kansas City, Missouri Prospect Pump Station.
- B. The System Integrator shall be responsible for obtaining the required development licenses to develop the iFIX HMI screens and the RS Logix 5000 PLC program.
  - 1. Development licenses for the iFIX system are not required to be provided to the Owner at the completion of this project.
  - 2. Development licenses for the RS Logix 5000 are required to be provided to the Owner at the completion of this project.
    - a. Licenses shall be subversion 21.03.02.
- C. In general the descriptions provided for the equipment is applicable for the local operator workstation HMI screens.
- D. The operator workstation HMI screens shall be developed utilizing the latest version of iFIX.
- E. HMI Screens shall be developed for control interface and monitoring of the systems described.
- F. Provide access control to the operator workstation via password.
- G. All set points and time delays described in the sequence of operation are initial values and shall be adjustable by the Supervisor or Administrator as specified.

SECTION 40 61 96 – PROCESS CONTROL SOFTWARE PROGRAMMING AND REPORTS:  
continued

- H. All physical I/O points, all calculated values that are displayed on the operator interface, and all alarm points shall be communicated with the Transdyn SCADA system via the Modbus RTU communication network.
- I. All required programming associated with programming the described logic, communicating the required I/O points between the HMI and the existing SCADA system, developing the new screens and recording operating data for trending purposes shall be included.

3.02 NETWORK CONFIGURATION:

- A. Where applicable the System Integrator shall be responsible for programming and verifying the IP Addresses, Subnet, and Default Gateways, for all new devices on the network.

3.03 PROGRAMMABLE LOGIC CONTROLLER (PLC) PROGRAMMING:

- A. The existing PLC shall be programmed utilizing RSLogix 5000 programming software, revision 21.03.02.
- B. The PLC program shall be thoroughly documented with explanations in the PLC program of the operation performed in each program line or rung.
- C. Where possible the PLCs shall be programmed utilizing object-oriented programming (OOP) blocks and user defined data types (UDT) to maintain consistency throughout the PLC program. Programming blocks shall be developed with the worst case scenario in mind to allow blocks to be adaptable throughout the project. Proposed blocks shall be submitted as specified.
- D. The PLC shall be programmed to perform the required logic for proper operation of the associated equipment.
- E. The PLC shall monitor communications status on the network and alarm if communication failures occur.
- F. Points indicated to be communicated with the SCADA system via the Modbus RTU network shall be clearly identified and organized to provide efficient communication with the SCADA system.
- G. The PLC monitors power status of the building power supply. Logic shall be implemented that shall clear run contacts, shut down equipment when power to the facility is lost. Equipment shall be manually restarted by operator.
- H. Each door and panel alarm point shall be programmed to alarm instantaneously at SCADA.
- I. Momentary start contacts shall be programmed to close for 2 seconds and then open. Momentary stop contacts shall be programmed to open and stay open until shutdown of the motor is detected.
- J. All required field programming and tuning of the control loops shall be included.

3.04 INTERFACE TO EXISTING SCADA SYSTEM:

- A. A SCADA interface is currently in service to communicate with the existing Transdyn system. The link is accomplished by radio. Specific data files numbers are reserved for SCADA use and shall not be used outside of this purpose. Coordinate with the Owner

SECTION 40 61 96 – PROCESS CONTROL SOFTWARE PROGRAMMING AND REPORTS:  
continued

when setting up any data file registers when transferring Modbus information to the existing Transdyn system.

3.05 TANK ALTITUDE VALVE:

- A. The valve shall be capable of being controlled locally at the control panel or remotely by the PLC when the LOCAL/REMOTE switch at the valve is in REMOTE.
- B. Local Control:
  - 1. When the valve is in LOCAL control, opening, and closing of the valve shall be controlled via pushbuttons at the control panel.
- C. Remote Control:
  - 1. When the valve is in REMOTE control, opening, and closing of the valve shall be controlled via digital outputs in the PLC.
- D. The following shall be displayed on the front of the local control panel and communicated to the existing SCADA system:
  - 1. Valve fully open and closed status.
  - 2. Valve position.

3.06 AUXILIARY SYSTEMS:

- A. The following shall be communicated to the existing SCADA system:
  - 1. Door intrusion alarms.
  - 2. Obstruction lighting fault.
  - 3. Residual chlorine level.
- B. The following shall be displayed on the front of the local control panel and communicated to the existing SCADA system:
  - 1. Tank level.
  - 2. System pressure.

3.07 FIELD TESTING:

- A. A testing plan shall be developed and submitted for approval prior to testing of the control system. The testing plan shall describe each operation mode with the desired system response.
- B. Each mode of operation shall be tested along with fault conditions for proper system response.
- C. Each I/O point connected to or communicated with the PLC shall be tested for proper span and operation.
- D. HMI interfaces shall be tested for proper operation.
- E. Record results system tests and checkout and submit test reports.

END OF SECTION 40 61 96

## SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE

### PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.02 SUMMARY:
- A. This Section includes requirements for control panels including, but not limited to, the following:
    - 1. Remote I/O (RIO) and Control Panels.
- 1.03 RELATED REQUIREMENTS:
- A. Section 40 60 00 – Process Control and Instrumentation - General Requirements.
  - B. Section 40 61 96 – Process Control System Programming and Reports.
  - C. Section 40 70 00 – Instrumentation for Process Systems.
- 1.04 REFERENCE STANDARDS:
- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
  - B. Institute of Electrical and Electronic Engineers (IEEE):
    - 1. IEEE C37.90.1 – Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus.
    - 2. IEEE C62.11 – Metal Oxide Surge Arresters for AC Power Circuits.
    - 3. IEEE C62.33 – Test Specifications for Varistor Surge-Protective Devices.
    - 4. IEEE C62.36 – Surge Protectors Used in Low-Voltage Data, Communications, and Signaling Circuits
    - 5. IEEE C62.41.1 – Surge Environment in Low-Voltage (1000 Volts and less) AC Power Circuits.
    - 6. IEEE C62.41.2 – Characterization of Surges in Low-Voltage (1000 Volts and less) AC Power Circuits.
    - 7. IEEE C62.45 – Surge Testing on Equipment Connected to Low Voltage (1000 Volts and less) AC Power Circuits.
    - 8. IEEE C62.62 – Test Specification for Surge Protective Devices (SPDs) for Use on the Load Side of the Service Equipment in Low Voltage (1000 Volts and less) AC Power Circuits.
    - 9. IEEE 802.1 – Local and Metropolitan Area Networks.
    - 10. IEEE 802.3 – Ethernet.
  - C. National Fire Protection Association (NFPA):
    - 1. NFPA 70 – National Electrical Code (NEC).
    - 2. NFPA 79 – Electrical Standard for Industrial Machinery.
  - D. National Electrical Manufacturers Association (NEMA):
    - 1. NEMA 250 – Enclosures for Electrical Equipment (1,000V maximum).
    - 2. NEMA ICS 1 – Industrial Control and Systems - General Requirements.
    - 3. NEMA ICS 2 – Industrial Control and Systems - Controllers, Contactors, and Overload Relays Rated 600 Volts.
    - 4. NEMA ICS 4 – Application Guideline for Terminal Blocks.
    - 5. NEMA ICS 5 – Industrial Control and Systems - Control Circuit and Pilot Devices.
    - 6. NEMA ICS 6 – Industrial Control and Systems - Enclosures.
  - E. Underwriters Laboratories (UL):

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

1. UL 50 – Enclosures for Electrical Equipment.
  2. UL 489 – Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
  3. UL 508 – Industrial Control Equipment.
  4. UL 508A – Industrial Control Panels.
  5. UL 698A – Industrial Control Panels Relating to Hazardous (Classified) Locations.
  6. UL 869A – Service Equipment.
  7. UL 1449 – Surge Protective Devices.
  8. UL 1778 – Uninterruptible Power Systems.
- 1.05 SUBMITTALS:
- A. Submit as specified in Division 01.
  - B. Manufacturer with prime responsibility shall assume responsibility for all Compliance Submittals.
  - C. Product Data: Submit the following for each type of product specified and included as minimum:
    1. Data sheets for all control panel components furnished.
  - D. Qualification Statements:
    1. Fabricator’s qualifications.
  - E. Shop Drawings: Provide the following as minimum:
    1. Fabrication drawings, front elevation, wiring diagrams, and bills of material for control panels.
    2. Electrical connection diagrams showing termination locations for all field wiring. External connection diagrams shall indicate cable number and wire color for field cables terminated at the panel.
    3. Engraving schedule and physical dimensions for nameplates.
    4. Provide heat dissipation calculations for all panels containing programmable logic controllers. Include calculation for ventilation fans if required.
  - F. Special Procedure Submittals:
    1. Test Plan:
      - a. Provide a complete and detailed test plan for the supplied control panels.
      - b. Include procedures for certification, validation, and testing.
    2. Syllabus for Owner training.
  - G. Test and Evaluation Reports:
    1. Factory test reports.
    2. Field test reports.
  - H. Closeout Submittals: Final documentation shall include the following as minimum:
    1. Operation and Maintenance Manuals including the following:
      - a. Operation and maintenance manuals for all components furnished.
      - b. Certified “As-Built”/“As-Installed” drawings.
      - c. Copies of all approved Product Data.
      - d. Copies of all approved Test Reports.
      - e. Spare parts and supply list.
      - f. Warranty Information.
      - g. Contractor Information.
      - h. Training Materials. Includes final edited training videos.
  - I. Maintenance Material Submittals:
    1. Spare Parts:
      - a. Two spare LED indicating lamps for each type and color used.

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

- b. Ten spare control fuses of each voltage and current rating used.
  - c. One aerosol cans of manufacturer's touch-up paint for each color used. Color shall match the original factory applied color.
  - d. Spare parts listed below are for RIO and Control Panels.
    - (1) Provide where applicable at least one spare for each piece of Equipment provided, including but not limited to:
      - (a) Processor.
      - (b) RIO chassis.
      - (c) Power supply.
      - (d) Communications interface module.
      - (e) Provide spare I/O cards in quantities corresponding to 10% (rounded up) of the total quantity of each type of card provided. At least one (1) spare shall be provided for each type of I/O card.
    - (2) Provide ten (10) spare fuses of each type used including those used in power supplies, processor and all I/O cards.
2. Software:
- a. Soft copy of PLC programs including programming comments.
  - b. Where external applications are required and not embedded within the equipment, provide original software on USB, SD, or other flash drive media containing all configuration files and applications associated with managed Ethernet switches, UPS, and similar configurable devices.
  - c. Organize and submit all software copies in a 3-ring binder with individually labeled for each sleeve.
- 1.06 QUALITY ASSURANCE:
- A. Materials and Equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall be the manufacturer's latest standard design that has been in satisfactory use for at least 1 year prior to Bid opening.
  - B. Fabricator Qualifications:
    - 1. Prior to assembly and installation, submit data of fabricator's experience and qualifications.
    - 2. Fabrication shall be by a manufacturer or a particular division of a manufacturing firm specializing in control panel construction.
    - 3. Shall have a minimum of 10 years experience in control panel fabrication.
    - 4. Panel shall be fabricated in a UL listed panel shop.
  - C. Factory Tests:
    - 1. The manufacturer shall conduct tests according to industry standard requirements.
    - 2. Perform factory tests on all control panels and components and subassemblies to assure that all devices and systems are in proper working order before delivery to jobsite.
    - 3. Test all power, control and communication systems for proper operation.
    - 4. Simulate actual system operation.
    - 5. Submit test reports as specified in Division 01.
  - D. All control panels and associated equipment shall conform to the requirements of NEMA ICS and UL 508A standards.
- 1.07 DELIVERY, STORAGE, AND HANDLING:
- A. Control panels and associate equipment shall be packaged and shipped to the project site in such a manner as to avoid damage.

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- B. All control panels shall be stored according to the manufacturer's instructions and in a conditioned space to avoid condensation, dust, and other environmental contaminants.

1.08 PROJECT SITE CONDITIONS:

- A. Do not store or install the control panel equipment specified herein until designated installation spaces are suitable for intended service.
- B. For indoor control panels final or temporary HVAC systems shall be in place and operational to maintain the ambient temperatures and humidity conditions at occupancy levels prior to energizing panel and shall be maintained for the remainder of the construction period.

1.09 WARRANTY:

- A. Surge Protective Devices shall be provided with a minimum 5-year manufacturer's warranty.
- B. Ethernet switches shall be provided with a minimum 5-year manufacturer's warranty.
- C. All other equipment shall be provided with a minimum one-year warranty period.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Enclosures:
  - 1. B-Line, Eaton.
  - 2. Hoffman, Pentair PLC.
  - 3. Wiegmann, Hubbell, Inc.
  - 4. Milbank Manufacturing Company.
  - 5. Rittal, Inc.
  - 6. Saginaw Control & Engineering.
- B. Thermal Management Components:
  - 1. Hoffman, Pentair PLC.
  - 2. Noren Products, Inc.
  - 3. Pfannenberg.
  - 4. Rittal, Inc.
  - 5. Saginaw Control & Engineering.
- C. Surge Protective Devices:
  - 1. Advanced Protection Technologies, Inc.
  - 2. Citel, Inc.
  - 3. ASCO/EDCO, Vertiv Co.
  - 4. Ferraz Shawmut, Mersen.
  - 5. MCG Surge Protection, Inc.
  - 6. MTL Instruments, Eaton.
  - 7. Phoenix Contact.
  - 8. Square-D, Schneider Electric.
- D. Terminal Blocks:
  - 1. Allen-Bradley, Rockwell Automation, Inc.
  - 2. Buchanan, Tyco Electronics Corporation.
  - 3. Phoenix Contact.
  - 4. Square-D, Schneider Electric.
  - 5. Weidmuller.
- E. Push Buttons, Selector Switches and Pilot Lights:
  - 1. Allen-Bradley, Rockwell Automation, Inc.
  - 2. Appleton, Emerson Electric Company.

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3. Eaton.
4. IDEC Corporation.
5. Killark, Hubbell, Inc.
6. Square-D, Schneider Electric.
- F. Control and Timing Relays:
  1. Allen-Bradley, Rockwell Automation, Inc.
  2. Eaton.
  3. IDEC Corporation.
  4. Phoenix Contact.
  5. Potter & Brumfield, Tyco Electronics Corporation.
  6. Square-D, Schneider Electric.
  7. Turck, Inc.
- G. DC Power Supplies:
  1. Allen-Bradley, Rockwell Automation, Inc.
  2. IDEC Corporation.
  3. Phoenix Contact.
  4. PULS.
  5. SolaHD, Emerson Electric Company.
- H. Uninterruptible Power Supplies (UPS):
  1. American Power Conversion Corporation, Schneider Electric.
  2. Liebert, Vertiv Co.
  3. Powerware, Eaton.
  4. Tripp Lite.
- I. Convenience and UPS Receptacles:
  1. Cooper Industries, Eaton.
  2. Hubbell, Inc.
  3. Leviton Manufacturing Co., Inc.
  4. Phoenix Contact.
- J. Interior Illumination:
  1. Acuity Brands, Inc.
  2. Hoffman, Pentair Inc.
  3. Hubbell, Inc.
  4. Stego, Inc.
- K. Fiber-Optic Cable Connectors, Duplex Jumpers, Patch Panels and Accessories:
  1. AFL.
  2. Avaya Inc.
  3. Corning Optical Communications.
  4. Ortronics, Legrand.
  5. Panduit.
- L. Ethernet Switches:
  1. Allen-Bradley, Rockwell Automation, Inc.
  2. Hirschmann, Belden Inc.
  3. Moxa Inc.
  4. GarrettCom, Inc.
  5. N-Tron Corporation.
  6. Phoenix Contact.
- M. Programmable Logic Controllers and RIO:
  1. Allen-Bradley, Rockwell Automation.
- N. Distributed I/O Modules:

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

- O. Wiring Duct:
  - 1. Allen-Bradley, Rockwell Automation.
  - 1. Panduit Corporation, H-Type.
  - 2. Thomas and Betts Corporation, ABB Group.
- P. Wire Markers:
  - 1. Brady Worldwide, Inc.
  - 2. Panduit Corporation.
  - 3. Thomas and Betts Corporation, ABB Group.
- Q. Wire Terminals and Connectors:
  - 1. Refer to Section 26 05 19 – Low Voltage Electrical Conductors and Cables.

2.02 ENCLOSURES:

- A. Totally enclosed panel with gasketed doors, continuous hinge, and three point latching mechanism with lockable handle.
- B. Sized to house all equipment and devices required, provide sufficient space for conduit entry, and provide sufficient heat dissipation for the installed components.
- C. Unless specified or indicated otherwise provide the following NEMA 250 approved enclosure type(s):
  - 1. NEMA Type 12 painted steel enclosures for the following areas [and panels]:
    - a. Indoor spaces.
- D. Unless specified or indicated otherwise provide the following enclosure design:
  - 1. Wall Mount Design:
    - a. Provide for enclosures with a vertical dimension less than 36-inches.
    - b. Formed and welded construction, minimum 14-gauge.
    - c. Interior 12-gage minimum steel mounting panel(s).
    - d. Provide mounting tabs and required hardware for installation of enclosures.
- E. Provide lockable design.
- F. Painted enclosures shall have a light gray polyester powder coat finish on the exterior with a white polyester powder coat finish on the interior.
- G. Accessories:
  - 1. Provide data pocket mounted on the interior of the panel for storage of wiring diagrams.
  - 2. Provide vapor action corrosion inhibitor emitters for each panel. Emitters shall be provided as a minimum based upon twice the calculated volume of the enclosure.
- H. Shall comply with UL 50, UL 508A, and NEMA ICS 6 standards.

2.03 THERMAL MANAGEMENT:

- A. Ventilation Fans:
  - 1. Provide as required to maintain panel temperature below component ratings.
  - 2. Provide a compact 6-inch fan with rigid metal housing with finger guard. Motor shall be thermally protected and bearings shall be permanently lubricated ball bearings and design for a minimum of 50,000 hours of continuous operation. Impeller shall be polycarbonate. Powered from 120Vac.
  - 3. Provide 14-gage steel louver for the intake and exhaust openings. Louver finish shall match the finish on the panel. Provide an aluminum filter and gasket for each louver.
  - 4. Provide all required mounting brackets for complete installation in the panel.
  - 5. Temperature Control Switches:
    - a. Provide temperature control switch for panel, for control of the exhaust fan as indicated.
    - b. The temperature control switches shall have an adjustable range of 30°F to 140°F.

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- c. The temperature switch contact shall close on temperature rise and be rated 15A at 120Vac.
- d. Designed for DIN rail mounting.

2.04 NAMEPLATES:

- A. Fabricate from laminated phenolic sheeting with black core and satin finish melamine overlay.
- B. Colors shall white with black letters.
- C. Thickness: 1/16 inch nominal.
- D. Bevel edges to expose black core on perimeter.
- E. Engraved legend through overlay to expose core.
- F. Attach to panels with industrial grade double-faced tape.

2.05 CIRCUIT BREAKERS:

- A. 120/240Vac and 24Vdc:
  - 1. Provide for main disconnecting means for panel and for power distribution within the panel as indicated.
  - 2. Rated for 120/240Vac and 24Vdc as indicated.
  - 3. Thermal-magnetic trip units.
  - 4. Trip rating and curve as recommended by manufacturer of equipment being protected.
  - 5. DIN rail mounted on the inside of the control panel in a readily accessible location.
  - 6. Toggle-type handle with a quick-make, quick-break over-center switching mechanism that is mechanically trip-free.
  - 7. Minimum symmetrical interrupting capacity of 10,000 AIC.
- B. All circuit breakers must be UL 489 listed.

2.06 SURGE PROTECTIVE DEVICES:

- A. 120/240V Surge Suppressors:
  - 1. Provide for 120V/240Vac distribution system within panel to protect electronic components from transient voltage surges.
  - 2. UL 1449 listed.
  - 3. Shall meet Type 2 SPD criteria with the following minimum protection characteristics:
    - a.  $I_n$ : 20kA (per mode)
    - b. SCCR: 100kAIC (minimum)
    - c. MCOV: 150V (L-G), 270 (L-L).
    - d. UL Voltage Protection Rating:
      - (1) L-L: 1000V
      - (2) L-N, L-G, N-G: 600V
  - 4. Designed for 120/240Vac, single-phase operation.
  - 5. EMI/RFI filtering.
  - 6. Peak clamping voltage of 320 volts line to neutral and 350 volts line to ground with Category B waveform.
  - 7. Minimum surge current capacity of 10 kA per mode (8/20 $\mu$ s).
  - 8. Response time of less than 25 nanoseconds.
  - 9. Equipped with an LED status indicator for verification that unit is functioning.
  - 10. NEMA 1 enclosure designed for back panel or DIN rail mounting within a control panel.
  - 11. Minimum five year warranty.
- B. Panel I/O Surge Suppressors:
  - 1. Provide DIN rail mounted terminal block type transient voltage surge suppressors for all inputs and outputs that are wired to devices located outside of the building envelope.

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

2. Finger safe screw type terminals.
  3. Replaceable surge modules.
  4. Three-stage surge protection.
  5. Provisions for labeling terminal block numbers.
  6. Minimum five year warranty.
  7. Analog and 24Vdc Signal Surge Protection:
    - a. Series surge suppressor.
    - b. Minimum surge current capacity of 10 kA per mode (8/20 $\mu$ s).
    - c. Minimum lightning surge current capacity of 500A per path (10/350 $\mu$ s).
    - d. Maximum let thru voltage line to ground of 45 Vdc.
    - e. Maximum let thru voltage line to line of 90 Vdc.
    - f. Response time of less than 5 nanoseconds.
    - g. Maximum series resistance of 10 ohms.
    - h. Minimum continuous current rating of 300 mA.
  8. 120Vac Discrete Signal Surge Protection:
    - a. Series surge suppressor.
    - b. Minimum surge current capacity of 4 kA per mode (8/20 $\mu$ s).
    - c. Minimum lightning surge current capacity of 2.5 kA per path (10/350 $\mu$ s).
    - d. Maximum let thru voltage line to ground 380 Vac.
    - e. Maximum let thru voltage line to line of 600 Vac.
  9. Minimum continuous current rating of 15A.
  10. Response time of less than 25 nanoseconds.
- C. Shall be designed to pass the appropriate IEEE testing standards included below:
1. IEEE C62.11.
  2. IEEE C62.33.
  3. IEEE C62.36.
  4. IEEE C62.45.
  5. IEEE C62.62.

2.07 TERMINAL BLOCKS:

- A. 600V, sectional type polyamide blocks.
- B. Rated a minimum of 24A. Provide higher Amp rated blocks as required.
- C. Spring-cage connection type.
- D. Finger safe.
- E. Slide in vinyl marking strip for terminal identification.
- F. DIN rail mounted.
- G. Terminal blocks shall comply with NEMA ICS 4.

2.08 SWITCH ACTION FUSE BLOCKS:

- A. Rated 600V.
- B. Spring-cage connection type.
- C. Finger safe.
- D. DIN Rail mounted.

2.09 PUSH BUTTONS AND SELECTOR SWITCHES:

- A. Heavy duty, 30 mm units with contacts rated 10A continuous at 120Vac.
- B. NEMA 4X rated when installed in NEMA 12 or 4X enclosures.
- C. Provide the number of contacts and contact development as indicated.
- D. Operator colors shall comply with UL 508A and NFPA 79.

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

1. Start or Open push buttons shall have green operators.
  2. Stop or Close push buttons shall have red operators.
  - E. Push Buttons and Selector Switches shall conform to NEMA ICS 5.
- 2.10 PILOT LIGHTS:
- A. Heavy duty, 30 mm units.
  - B. NEMA 4X rated when installed in NEMA 12 or 4X enclosures.
  - C. 120Vac or 24Vdc cluster LED type.
  - D. Green lights shall indicate “Equipment On”, “Running”, or “Valve Open”.
  - E. Red lights shall indicate “Equipment Off”, “Stopped”, or “Valve Closed”.
  - F. Amber lights shall indicate “Equipment Failure” or “Alarm”.
  - G. Push-to-test type.
  - H. Pilot lights shall conform to NEMA ICS 5.
- 2.11 CONTROL RELAYS:
- A. Plug-in type relay with neon coil energization indicator.
  - B. Coil voltage: 120Vac or 24Vdc as required.
  - C. Contacts rated 10 Amps at 120Vac.
  - D. Number of contacts as required.
    1. Provide one spare N.O. and one spare N.C. contact (minimum).
    2. Spare contacts shall be as indicated.
  - E. Provide DIN rail mounted relay socket with screw type terminations.
  - F. Control relays shall conform to NEMA ICS 5.
- 2.12 DC POWER SUPPLIES:
- A. Provide industrial rated primary switched 24Vdc power supplies as specified and indicated.
  - B. Enclosed design with finger safe input and output terminal blocks.
  - C. Designed for DIN rail or back panel mounting.
  - D. DC power supply rated as follows:
    1. Input voltage: 95 to 130Vac.
    2. Output voltage: 24Vdc  $\pm 1\%$ .
    3. Output current: As indicated or required with a minimum 25% spare capacity.
    4. Line regulation:  $\pm 0.2\%$  maximum.
    5. Load regulation:  $\pm 1.5\%$  maximum.
    6. Ripple:  $< 50$  mV pk-pk.
    7. No overshoot for turn on, turn off, or power failure.
    8. Operating temperature:  $-25^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ .
    9. Overload and short circuit protection.
    10. Indicating lights for status.
  - E. DC UPS System:
    1. Provide DC power supplies equipped with a UPS System as indicated for the following control panels:
    2. Shall charge and monitor the battery.
    3. Shall automatically switch without interruption to battery power if the primary 120Vac source is lost and switch back automatically to the 120Vac source when power is restored.
    4. The UPS system shall utilize maintenance free lead-acid batteries rated to provide a minimum of 60 minutes of backup time for the connected load.
    5. Provide a support rack for the batteries designed for DIN rail or back panel mounting.

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

6. Equipped with a resettable over current protection to protect the batteries.
  7. The batteries shall be field replaceable.
    - a. The unit shall be equipped with an on/off switch to bypass the battery system and allow for replacement of the batteries while the power supply is in operation.
  8. The system shall provide relay outputs rated a minimum of 0.25A at 24Vdc to indicate the following:
    - a. AC Power Failure.
    - b. Low Battery.
  9. Conform to UL 1778.
- 2.13 CONVENIENCE RECEPTACLES:
- A. Interior Mounted Receptacle:
    1. DIN rail mounted, 15-A duplex three-wire grounding GFCI type receptacle with enclosure.
    2. Equipped with terminal blocks for power connection.
    3. Outlet shall be protected with a 5 Amp circuit breaker.
    4. One mounted inside control panel for use in powering laptops and test equipment for service of the panel.
- 2.14 INTERIOR ILLUMINATION:
- A. Provide LED type panel lights.
  - B. Minimum 50,000 hour life.
  - C. Size and quantity designed to provide a minimum 50 foot-candles at the base of the panel.
  - D. Powered from 120Vac. Provide required power supply.
  - E. Door interlocked switch.
- 2.15 FIBER-OPTIC PATCH PANELS:
- A. Shall be a complete system of components by a single manufacturer, and shall provide termination, splice storage, routing, radius limiting, cable fastening, storage, and cross connection.
  - B. Shall be capable of terminating number of fibers indicated plus 25% spare capacity.
  - C. Shall be equipped with strain-relief and routing guides for incoming cables to ensure minimum bend radius is not exceeded.
  - D. Patch panels shall be provided with adapter plates loaded with STC connectors that utilize zirconia ceramic alignment sleeves. Connectors shall be provided with dust covers.
  - E. Epoxyless crimp style SC connectors compatible with 62.5/125 multimode fiber and shall have maximum attenuation of .3 dB at 1300 nm with less than a 0.2 dB change after 500 mating cycles.
  - F. Shall be provided with labeling space, panel directory and warning labels.
  - G. Panel Mounted:
    1. Single compartment enclosure or modular design with fiber optic adaptors mounted in the side or face of unit.
    2. Shall be DIN or back-panel mounted in enclosure or control panels as indicated.
    3. Coordinate size of patch panel with control panel manufacturer.
  - H. Cable management rings to provide bending radius control for patch cords.
- 2.16 FIBER-OPTIC DUPLEX JUMPER/PATCH CORD:
- A. Two-fiber cable with zipcord cable design, riser - rated (UL listed type OFNR).
  - B. Fiber shall be 62.5/125 $\mu$ m, multimode, graded index.

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- C. Factory installed connectors on each end of each fiber for patch through cables and connection to panel mounted Ethernet switches as required.
  - D. Minimum length of 3 feet. Provide longer jumpers as required.
  - E. Provide patch cords as indicated plus 25% spare of each type.
- 2.17 PANEL MOUNT MANAGED ETHERNET SWITCHES:
- A. Panel mounted managed Ethernet switches shall be 10/100/1000 Mbps autosensing and operate using the Store and Forward Method.
  - B. Compact Industrial DIN rail mounted design.
  - C. Convection cooled with no fans and designed for an industrial environment.
  - D. Operating temperature 0°C to 60°C minimum.
  - E. Ethernet switch shall be modular in design and accept Small form-factor pluggable (SFP) media modules.
  - F. Provide with a minimum of two gigabit SX ports for connection to the fiber backbone when indicated. Provide with multimode LC type connectors.
  - G. Provide with the indicated number of 10/100/1000 Base-T RJ-45 ports.
  - H. Shall provide half and full duplex operation.
  - I. Input power 24Vdc with terminal blocks for connection.
  - J. LED indicators for system status, each power supply status, fault.
  - K. LED indicators for each port indicating link, activity, full/half duplex mode and speed.
  - L. Provide with a basic set of I/O parameters available via the Ethernet/IP protocol for device management and remote monitoring.
  - M. Provide an alarm output contact rated a minimum of 0.5 Amp at 30Vac (60Vdc). Contact shall close when a fault condition is detected.
  - N. Comply with IEEE 802.1Q, 802.1D, 802.3, 802.3U, 802.3X, 802.3Z, and 802.3ab.
  - O. Capable of operating in a mesh network with rapid spanning tree protocol.
  - P. Shall support the following protocols or functions as minimum: SNMPv3, IGMP, DHCP, RMON, RSTP, HTTP, HTTPS, Telnet, and VLAN.
  - Q. Shall be UL listed and FCC approved. Unit shall be rated for continuous operation under the environmental temperature, humidity, and vibrating conditions encountered at the installed location.
  - R. Provide all required management and monitoring software
- 2.18 REMOTE I/O (RIO):
- A. Provide Allen-Bradley ControlLogix series hardware as specified and indicated for Remote I/O and Control Panel.
    - 1. Chassis:
      - a. Provide RIO chassis as required to accommodate the I/O and communications modules required and indicated.
      - b. Provide slot fillers for all unused chassis spaces.
    - 2. Power Supplies:
      - a. Provide power supplies for the processor chassis and expansion chassis as required.
      - b. Power supply shall be sized to supply required power for all installed modules and any spare spaces within the chassis.
      - c. Input voltage shall be 24Vdc as indicated.
    - 3. Communications Hardware:
      - a. Provide Ethernet/IP communication modules as indicated for communications via an Ethernet PLC communications network.

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- (a) Programming functions shall be possible over the Ethernet communications network.
          - (b) Unloading and downloading of programs shall be possible over the Ethernet communications network.
        - (2) Provide quantity of communication modules to physically segment the PCS operator interface/HMI network from device and motor control I/O networks.
          - (a) Each RIO shall incorporate a minimum of one dedicated module for the device I/O communications, or multiple where indicated.
          - (b) Each RIO shall incorporate one dedicated module for the PCS operator, or dedicated connection through the processor integral Ethernet/IP port as applicable for the supplied processor.
        - (3) Provide communications module 1756-EN2T.
      - b. Provide all required communication cables, connectors, and terminating resistors.
    - 4. RIO Input and Output Modules:
      - a. Digital Input Modules:
        - (1) Provide module 1756-IA16.
      - b. Relay Output Modules:
        - (1) Provide module 1756-OX8I.
      - a. Digital Output Modules:
        - (1) Provide module 1756-OA16.
      - b. Analog Input Modules:
        - (1) Provide module 1756-IF8.
      - c. Analog Output Modules:
        - (1) Provide module 1756-OF8I.
      - d. Provide screw clamp removable terminal block connectors for each module.
- 2.19 SYSTEM I/O:
  - A. Refer to the I/O List required to be provided for the plant control system.
- 2.20 ELECTRICAL SYSTEM:
  - A. Wiring:
    - 1. UL style 1015 (AWM), or UL style 1063 machine tool wire (MTW), 600V, 90°C.
    - 2. No. 14 AWG (minimum), 41 strand, for all control wiring.
    - 3. No. 16 AWG (minimum), shielded twisted pairs and triads as applicable for all instrumentation wiring.
      - a. Color code shall be black/red pair (black/red/white triad) with black PVC jacket.
    - 4. Wire Colors (UL508A):
      - a. Black: 240V or 480V AC wiring.
      - b. Red: 120V AC wiring.
      - c. White: AC neutral.
      - d. Green: Ground.
      - e. Blue: DC(+).
      - f. White w/ Blue Tracer: DC(-) grounded.
      - g. From alternate power source that remains energized when main disconnect is open:
        - (1) Yellow: Un-switched power.
        - (2) White w/Yellow Tracer: Un-switched neutral.
  - B. Wire Markers:
    - 1. Heat shrinkable, tube-type sleeve markers, constructed of polyolefin material.
    - 2. White sleeves with black thermal printed text.

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3. Identify both ends of wire with the same unique wire number.
  4. Assign wire numbers where specific designations are not indicated.
  5. Markers sized for snug fit for wire size.
- C. Wiring Duct:
1. Provide wide slot wiring duct in panel for routing of panel wiring. Slots shall be a minimum of 0.25-inches.
  2. Provide with dual hinge, push-on cover that opens a minimum of 100 degrees to either side.
  3. Wiring ducts shall be sized to accommodate all installed wire plus a minimum of 25% spare capacity.
- D. Ground Bus:
1. Provide copper ground bus for power circuits.
  2. Provide isolated copper ground bus for instrument shields.

2.21 ARC FLASH LABEL:

- A. Provide a 6 x 4 inch (minimum), plastic arc flash label for each control panel.
- B. Label shall be orange and white.
- C. Label shall read as follows: WARNING – Arc Flash and Shock Hazard. Appropriate PPE and Tools Required When Working on this Equipment.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify site conditions are suitable for installation of equipment.
- B. For indoor control panels final or temporary HVAC systems shall be in place and operational to maintain the ambient temperatures and humidity conditions at occupancy levels prior to energizing panel and shall be maintained for the remainder of the construction period.

3.02 PANEL FABRICATION:

- A. Install all components in the panel as required and recommended by the manufacturer.
- B. Provide master nameplate and nameplates for all operator interfaces. Interior nameplates shall be provided for individual component identification including, but not limited to, power supplies, PLCs, control relays, terminal blocks, Ethernet switches, circuit breakers, etc.
- C. Provide interior illumination for all panels.
- D. Power Distribution:
  1. Provide circuit breakers for protection of equipment in the panel and distribution of power to equipment powered from the control panel. Fuses shall not be used for overcurrent protection.
  2. Provide 120Vac circuit breakers to distribute power within the control panel. Circuit breakers shall be sized based upon connected load. As a minimum, a dedicated circuit breaker shall be provided for the each of the following:
    - a. Incoming power sources.
    - b. UPS power source.
    - c. Each device such as lights, fans, heaters, receptacles installed within the panel.
    - d. 24Vdc power supplies.
  3. Provide 24Vdc circuit breakers to distribute power within the control panel. Circuit breakers shall be sized based upon connected load. As a minimum, a dedicated circuit breaker shall be provided for each of the following:
    - a. Output of 24Vdc power supply.

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- b. PLC power supply (24Vdc).
- c. Each 24Vdc digital input or output module.
- d. Each loop powered instrument.
- e. Each analog input module, if required.
- f. Each analog output module, if required.
- g. Each 24Vdc instrument or device powered from the panel.
4. Provide signage on panel to clearly indicate that the panel is powered from multiple sources if applicable.
- E. Surge Protection:
  1. Provide surge protection on the 120Vac distribution systems within the panel to protect electronic components from transient voltage surges.
  2. Provide surge protection on all power circuits to instruments installed outside of the building envelope in which the control panel is installed. The terminal block type surge suppressor shall be the termination point for the field cabling.
  3. Provide surge protection on all inputs and outputs that are connected to equipment outside of the building envelope in which the control panel is installed. The terminal block type surge suppressor shall be the termination point for the field cabling.
- F. Component Mounting:
  1. Operator interfaces and indicating lights shall be installed in the door of the panel at a convenient height for operator interaction.
  2. Components shall be mounted to provide complete accessibility to all terminals, relay sockets, and other devices without dismantling of panel equipment.
  3. Provide sufficient space around and layout components to allow for proper heat dissipation.
  4. Provide sufficient space at the top and bottom of the panel for conduits and cable entry. Conduit entry locations shall be coordinated with the installing Contractor.
- G. PLC I/O:
  1. Provide interposing relays for all relay outputs from the PLC driving loads and when indicated.
  2. Wire all inputs and outputs from the PLC to terminal blocks.
- H. Wiring Methods:
  1. Route main groups of wires in plastic nonflammable wiring duct.
  2. Smaller groups of wire shall be cabled and secured with nylon cable clamps and ties or plastic spiral wraps.
  3. Maintain physical separation of power, control and instrumentation cables within the panel.
  4. Provide dedicated wiring ducts for management of field cables within the panel. Wiring ducts shall be sized to accommodate multi-conductor control cables. Assume a minimum of 25% spare conductors and provide a minimum of 25% spare capacity when sizing wiring ducts.
- I. Terminal Blocks and Connections:
  1. Provide terminal blocks for all external connections.
  2. Make all connections on terminal blocks.
  3. Follow manufacturer's recommendations for terminal block installation.
  4. Connect terminal blocks for instrumentation cable shields to isolated ground bus.
  5. Provide required grounding type terminal blocks.

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

- J. Spare Capacity:
    - 1. Provide a minimum of 2 circuit breakers, whichever is greater, for each power source (Vac and Vdc) present within the panel. All spare circuit breakers shall be mounted, wired, and include provisions to terminate associated neutral or negative conductors.
    - 2. Provide a minimum of 2 spare slots in each PLC chassis. Provide blank filler modules for all empty slots.
    - 3. Provide a minimum of 20 percent points, whichever is greater, spare PLC inputs and outputs for each type in each panel. All spare points shall be wired to field terminal blocks. Fifty percent of spare analog inputs shall be configured to provide loop power.
    - 4. Provide a minimum of 20 percent spare terminal blocks of each type mounted in the panel.
    - 5. Provide spare DIN rail space for the installation of terminal blocks for all spare slots in the PLC chassis.
  - K. Provide labeling on all terminal blocks, wiring and relays to match panel drawings.
- 3.03 UNINTERRUPTIBLE POWER SUPPLY INSTALLATION:
- A. Install UPS systems in control panel as specified.
  - B. Startup and initial charging shall be as required by the UPS manufacturer.
  - C. Install the Maintenance Bypass Switch and make the required connections to UPS and loads served.
- 3.04 ETHERNET SWITCH INSTALLATION:
- A. Install Ethernet switches in control panels and make connections as indicated.
  - B. Arrange with proper clearances from other equipment and material to obtain accessibility for operation and maintenance.
  - C. Shall provide adequate ports for connection to the plant control system, RIO and provide a minimum of one spare programming port.
- 3.05 PLC PROGRAMMING:
- A. Refer to Section 40 61 96 – Process Control Software Programming and Reports for PLC programming requirements.
  - B. Soft copy of the program shall be provided to the Owner.
- 3.06 INSTALLATION:
- A. Control Panels:
    - 1. Conform to manufacturer’s written instructions.
    - 2. Surface-mount wall mount enclosures on structural supports or wall approximately 4 feet to center line above the floor when possible.
    - 3. Install floor mounted enclosures where indicated and bolt to floor using expansion type concrete anchors.
    - 4. Install all necessary openings in panels.
    - 5. Arrange with proper clearances from other equipment and material to obtain accessibility for operation and maintenance.
    - 6. Mount plumb and level.
  - B. Electrical Connections:
    - 1. Install wire and cable as specified in Division 26.
    - 2. Conform to manufacturer’s wiring diagrams.
    - 3. Install circuits to field-mounted equipment as indicated and required.
    - 4. Installation shall conform to NFPA 70 (NEC).

SECTION 40 67 00 – PROCESS CONTROL PANELS AND HARDWARE: continued

- C. Place arc flash label on equipment.

3.07 FIELD QUALITY CONTROL:

- A. Manufacturer's Field Services:
  - 1. The panel supplier shall provide the field services of a trained technician for the amount of time required to commission, test and start-up all equipment provided.
  - 2. All travel and living expenses shall be included for all trips to the site. All equipment required for testing, start-up and performance verification shall be provided by the start-up technician.
- B. Check all internal and external connections and tighten as required.
- C. Perform I/O checkout on all points and verify proper operation.
- D. Verify proper connection of communication cabling and proper communication system configuration.
- E. Field verify proper operation of all inputs and outputs.
- F. Record results of I/O checkout and submit test reports as specified in Division 01.

3.08 FINISHES:

- A. Control panel coatings shall be free from scratches, rust, or other defects.
- B. All damaged or defective coatings shall be repaired prior to final acceptance.
- C. Field Painting:
  - 1. Contractor shall prepare surfaces and touch up manufacturer applied coatings as required for any damage during shipment and installation.
  - 2. Field painting shall be performed based on manufacturer's recommended procedures.
  - 3. Contractor shall provide the necessary quantity of Manufacturer's touch-up paint to match the factory applied finish.

3.09 ADJUSTING AND CLEANING:

- A. After field installation and final wiring terminations are completed the control panel wiring and cables shall be adjusted and neatly secured with tie wraps, hook-and-loop straps, or the like.
- B. Wiring duct covers shall be replaced and secured as required.
- C. Prior to final acceptance control panel interior and exterior shall be wiped clean and free from dust and debris.

3.10 TRAINING:

- A. Provide a minimum of 4 hours of training for each panel provided at the customer's facility for operations, maintenance and service personnel.
  - 1. The training session shall include classroom discussion on the theory of operation of the equipment, as well as maintenance and service methods for the purchased equipment.
  - 2. Topics covered shall include safety, hardware layout and functions, power and control wiring, diagnostic indicators, keypad/display interface, faults, diagnostic tools, troubleshooting, and preventive maintenance.
  - 3. Hands-on training shall be provided on equipment.
  - 4. Documentation shall be provided which shall include actual manuals for the equipment and drawings and schematics of equipment supplied for this project.
- B. The Owner at their option shall be allowed to video record all training sessions for future reference.

END OF SECTION 40 67 00

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS

PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS:
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.02 SUMMARY:
- A. This Section includes the requirements for measuring and controlling instruments.
- 1.03 RELATED REQUIREMENTS:
- A. Section 40 67 00 – Process Control Panels and Hardware.
- 1.04 REFERENCE STANDARDS:
- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
  - B. American Society of Mechanical Engineers (ASME):
    - 1. ASME B16.5 – Pipe Flanges and Flanged Fittings.
  - C. International Society of Automation (ISA).
    - 1. ISA S20 – Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.
  - D. National Electrical Manufacturers Association (NEMA).
  - E. NSF International:
    - 1. NSF 61 - Drinking Water System Components - Health Effects.
- 1.05 SUBMITTALS:
- A. Submit as specified in Division 01.
  - B. Manufacturer with prime responsibility shall assume responsibility for all Compliance Submittals.
  - C. Product Data: Submit for each type of product specified and included the following as minimum:
    - 1. Individual specifications and technical data for instruments and similar major system components to conform to ISA S20.
    - 2. Electrical and mechanical connection diagrams for all instruments.
    - 3. Physical dimensions for each instrument.
  - D. Special Procedure Submittals:
    - 1. Test Plan:
      - a. Provide a complete and detailed calibration and test plan for the supplied instrumentation.
      - b. Include procedures for certification, validation, and testing.
    - 2. Syllabus for Owner training.
  - E. Test and Evaluation Reports:
    - 1. Factory test and calibration reports.
    - 2. Field test and calibration reports.
  - F. Closeout Submittals: Final documentation shall include the following as minimum:
    - 1. Operation and Maintenance Manuals including the following:
      - a. Operation and maintenance manuals for all instruments furnished.
      - b. Copies of all approved Product Data.
      - c. Copies of all approved Test and Calibration Reports.
      - d. Spare parts and supply list.

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS: continued

- e. Warranty Information.
- f. Contractor Information.
- g. Training Materials. Includes final edited training videos.
- G. Maintenance Material Submittals:
  - 1. Spare Parts:
    - a. Provide five (5) spare fuses of each type used.
    - b. Provide any cabling and serial to USB converters necessary to setup and calibrate supplied instrumentation from a laptop computer.
  - 2. Software:
    - a. Manufacturer supplied software required for setup and calibration of instrumentation shall be provided.
    - b. Assemble and submit all device type manager (DTM) software modules required for HART enabled instrumentation.
    - c. Organize and submit all software copies in a 3-ring binder.

1.06 QUALITY ASSURANCE:

- A. Factory Tests:
  - 1. As a minimum, the manufacturer's standard tests and calibration procedures shall be conducted on all instruments.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Instrumentation and associated equipment shall be packaged and shipped to the project site to avoid damage.
- B. All instrumentation shall be stored according to the manufacturer's instructions.

1.08 WARRANTY:

- A. Instruments shall be provided with a minimum 1-year manufacturer's warranty.
- B. In the event a component or instrument fails to perform as specified or is proven defective during the warranty period, the manufacturer shall promptly repair or replace the defective part at no cost to the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Chlorine Residual Analyzer:
  - 1. ASA Analytics, Inc
  - 2. Chemtrac, Inc.
  - 3. Hach Company.
  - 4. Hydro Instruments.
- B. Pressure Transmitters:
  - 1. Foxboro, Schneider Electric. Series IDPS10 or IGPS10
- C. Limit Switches:
  - 1. ABB.
  - 2. Allen-Bradley, Rockwell Automation, Inc.
  - 3. Honeywell International, Inc.
  - 4. Square D, Schneider Electric.
- D. Solenoid Valves:
  - 1. ASCO Valve, Inc.
  - 2. DeZURIK.

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS: continued

- E. Indicators:
  - 1. Endress+Hauser, Inc.
  - 2. Newport Electronics, Inc.
  - 3. Omega Engineering, Inc.
  - 4. Precision Digital Corporation.
  - 5. Red Lion Controls, Inc.
  
- 2.02 INSTRUMENTS:
  - A. Refer to the instrument list at the end of this Section for a list of instruments specified to be provided by this Division.
  
- 2.03 GENERAL:
  - A. Transmitters shall have an output signal of 4 to 20 mA dc into a minimum load range of 0-600 ohms at 24Vdc.
  - B. All analog indicating and recording receivers shall have evenly graduated scales.
  - C. Provide all mounting brackets, pipe stands and accessories required to install all field mounted instruments. All mounting brackets and hardware for instruments installed in exterior locations or within process areas shall be stainless steel.
  - D. Furnish and install all accessories required for complete and working systems as specified and indicated.
  - E. Provide sun shades for all exterior mounted transmitters.
  - F. All flanged instruments shall comply with ASME B16.5.
  
- 2.04 CHLORINE RESIDUAL ANALYZER:
  - A. The chlorine analyzer shall employ a DPD colorimetric method of measurement using DPD indicator and a buffer solution.
  - B. The analyzer shall be capable of measuring free or total residual chlorine by changing the indicator and buffer solutions.
  - C. A measurement shall be taken every 2.5 minutes and results displayed by a three digit LCD readout in the range of 0 to 5 mg/L.
  - D. The analyzer shall be designed for 30-days unattended operation.
  - E. The analyzer shall operate with an LED light source with a peak wavelength of 510 nm.
  - F. The instrument shall measure a sample blank before each sample measurement to provide automatic zero reference to compensate for sample color and turbidity and changes in light intensity due to voltage fluctuations or light source aging.
  - G. The instrument shall provide a minimum detection limit of 0.035 mg/L or better, precision better than  $\pm 5\%$  or 0.005 mg/L as Cl<sub>2</sub>, and accuracy better than  $\pm 5\%$  or 0.035 mg/L as Cl<sub>2</sub>.
  - H. The analyzer shall be microprocessor-controlled and provide a 4-20 mA analog signal.
  - I. The microprocessor shall provide self-diagnostic functions accessible through an alphanumeric, menu-driven keyboard.
  - J. Analog output span minimum and maximum values shall be operator programmable at the menu-driven keypad over the entire operating range.
  - K. The chlorine analyzer shall be housed in an IP-62 rated, ABS plastic enclosure designed for wall mounting.
  - L. The enclosure shall have two clear polycarbonate windows for viewing the measurement readout and reagent levels.
  - M. 1/4-inch sample connection and 1/2-inch drain connection.
  - N. Operate from 120V, 60 hertz.

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS: continued

- O. Accessories:
  - 1. Provide 1 year maintenance kit with preassembled tubing.
  - 2. Provide 60 days of buffer and indicator solution.
- P. Hach Company Chlorine Analyzer Model CL17 sc with sc200 controller.

2.05 DIFFERENTIAL AND GAUGE PRESSURE TRANSMITTERS:

- A. Electronic, two-wire type with a 4-20mA output and integral LCD display. When indicated provide unit with remote mounted transmitter housing.
- B. Stainless steel body with stainless steel wetted parts.
- C. Sensor fill fluid shall be silicone oil.
- D. Measuring element shall be a resonant wire or strain gauge type. Force balance mechanisms are not acceptable.
- E. Process connections shall be 1/2-inch NPT unless specified otherwise.
- F. Accuracy including hysteresis, linearity, and repeatability shall be within  $\pm 0.20\%$  of calibrated span.
- G. Provide zero, span, and damping adjustments. Zero adjustment shall be external.
- H. Zero suppression or elevation shall be adjustable to a minimum of 100% of calibrated span.
- I. Enclosure shall be NEMA 4X epoxy coated aluminum.
- J. Designed for wall or pipe stand mounting.
- K. Provide with Hart communication capability. Provide device type manager (DTM) software module for use in Hart device setup and monitoring software if required.
- L. Accessories:
  - 1. Stainless steel three or five-valve manifold, as indicated, for all differential pressure transmitters.
  - 2. Stainless steel two-valve block and bleed manifold for all pressure transmitters.
  - 3. Provide stainless steel mounting bracket for units indicated to be wall mounted.
  - 4. Provide sealing diaphragms where indicated.
  - 5. Provide pulsation dampeners (snubbers) in pressure transmitter sensing lines located at pump discharge.
  - 6. Provide with remote atmospheric pressure compensation tube, length as required.

2.06 LIMIT SWITCHES:

- A. SPDT contacts rated 5 amps at 120Vac minimum.
- B. Snap action type switch in a NEMA 4 enclosure.
- C. Operator type as required for the function specified or indicated.

2.07 SOLENOID VALVES:

- A. Solenoid operated, two way, three way, and four way control valves.
- B. Molded Class F, 120Vac coil in NEMA Type 4X enclosure.
- C. Integral maintained manual operator.
- D. Spring return to normal, except for double coil valves.
- E. Provide with electrical transient surge suppressor installed across coil.

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS: continued

2.08 INDICATORS:

A. Digital Panel Meters:

1. 7 segment light emitting diode (LED) display.
2. 0.5 inch high digits, number as specified.
3. Input signal shall be 4-20 mA dc.
4. Readout shall be in engineering units specified.
5. A/D conversion shall be dual slope integration method.
6. Zero offset and span adjustments shall be factory set as specified and shall be field adjustable.
7. Shall operate from a 120Vac, 60 hertz power supply.
8. Field selectable decimal point.
9. Normal Mode Rejection Ratio shall be 40 dB or greater at 60 hertz and Common Mode Rejection Ratio shall be 80 dB or greater from dc to 60 hertz.
10. Housed in a NEMA 4X, panel mounted enclosure.
11. Provide barrier terminal strips for external connections.
12. Furnish with mounting brackets and trim strips.
13. Shall include 2 relays with SPDT (Form C) contacts rated 2A minimum.
  - a. Relays shall be assignable to a process rate or total.
14. Shall include an isolated 4-20mA output.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Verify site conditions are suitable for installation of instrumentation and associated equipment.

3.02 INSTALLATION:

- A. Panel Mounted Devices: As specified in Section 40 67 00 – Process Control Panels and Hardware.

B. Field Mounted Devices:

1. Install as follows:
  - a. Mount on floor or wall as required.
  - b. Mount plumb and level.
  - c. Mount on walls with bottom of box or instrument four feet above floor unless indicated otherwise and instrument case spaced at least 1/2-inch away from wall.
  - d. Install supports as indicated.
  - e. Install floor-mounted instruments on strut support racks.
  - f. Install measuring and controlling instruments in accordance with manufacturer's written instructions.
  - g. Calibrate and setup instruments to specified ranges. Install DTM files in Hart software library if required.
  - h. Install identification tags on all instruments.
2. Connect inputs and outputs as indicated on the manufacturer's shop drawings and as follows:
  - a. Transmitters requiring electric power shall be supplied from their associated control panels.

3.03 FIELD QUALITY CONTROL:

A. Manufacturer's field services:

1. Manufacturer's field services shall be provided as specified in this Section.

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS: continued

2. Provide a minimum of 2 hours for each instrument to supervise/inspect installation, commission, test and start-up all equipment provided.
  3. All equipment required for testing, start-up and performance verification shall be provided by the start-up technician.
  4. All travel and living expenses shall be included.
- B. Field Testing:
1. Test and start-up supervision shall continue until the system is in proper operating condition as determined by Engineer.
  2. Provide manufacturer's supervision during Work to correct deficiencies in Equipment manufactured by them and to correct deficiencies in the installation and wiring of Equipment. Corrections shall be at no increase in the Contract Price.
  3. Functional Testing of Controls:
    - a. Perform before equipment is placed in service.
    - b. Include operating control system from each control point.
    - c. Completely check each annunciator point and equipment alarm.
    - d. Operate by hand all relays, pressure switches, limit switches and other system components that cannot be operated in normal manner with plant not in service.
    - e. Repeat with plant in operation.
  4. Instrument Tests and Adjustments:
    - a. Calibrate and startup measuring and controlling instruments in accordance with manufacturers recommendations.
    - b. With each system variable transmitter disconnected from its normal source of input signal, apply an input with manometer, instrument potentiometer, or other device and adjust span and zero on all instruments transmitting, receiving, or retransmitting the resulting variable current, voltage, time duration or pneumatic signal and on all final control devices. Check instruments and final control devices at several points over the instrument measuring or control device span.
    - c. Apply manually adjustable time duration or current signals directly to receivers where required to adjust zero and span and to check operation of the instrument over the measuring span.
    - d. Accurately measure variable current, voltage, time duration and pneumatic signals as required to adjust all receivers, transmitters, transducers, and final control devices.
    - e. Check operation of controller with various set points and system variable inputs; adjust controller proportional band, reset, and rate to conform to instructions from manufacturer's representative and Engineer.
    - f. Check operation of each instrument with system in actual operation.
    - g. Readjust controller settings as required to obtain desired control of the associated system variables.

3.04 TRAINING:

- A. Provide a minimum of 4 hours of training at the customer's facility for operations, maintenance and service personnel for each type of instrument provided.
1. The training session shall include classroom discussion on the theory of operation of the equipment, as well as maintenance and service methods for the purchased equipment.
  2. Topics covered shall include safety, hardware layout and functions, power and control wiring, diagnostic indicators, keypad/display interface, faults, diagnostic tools, troubleshooting, and preventive maintenance.
  3. Hands-on training shall be provided on equipment.

SECTION 40 70 00 – INSTRUMENTATION FOR PROCESS SYSTEMS: continued

4. Documentation shall be provided which shall include actual manuals for the equipment and drawings and schematics of equipment supplied for this project.
- B. The Owner at their option shall be allowed to video record all training sessions for future reference.

END OF SECTION 40 70 00