

AquaWorks DBO, Inc. 3252 Williams Street Denver, Colorado 80205 (303) 477-5915 www.aquaworksdbo.com info@aquaworksdbo.com

January 16, 2020

Mr. Bret Icenogle, P.E. Water Quality Control Division 4300 Cherry Creek Drive South Denver, CO 80246-1530

RE: Arabian Acres Construction Application Submittal PWSID#CO-0160075

Dear Mr. Icenogle,

The Arabian Acres Metropolitan District, located in unincorporated Teller County, Colorado, is submitting the attached Construction Application for improvements to its potable water treatment system to the Colorado Department of Public Health and Environment. The proposed improvements consist of installing two new groundwater wells, removing and replacing the two existing control (treatment) buildings, replacing the existing 38,000 gallon water storage tank with a new 100,000 gallon water storage tank, removing and replacing portions of the distribution system, and other miscellaneous improvements.

The proposed improvements will significantly improve the condition of the district. The system will be able to produce more water with the new well sources and additional pumping capabilities. Less water will be lost in the distribution system by replacing the leak prone water lines. The district is concurrently applying for an SRF loan for this project. It has been awarded a \$1,000,000 DOLA EIAF Grant.

Attached for your review is an electronic copy of the application materials. A hard copy can be provided if required. Please feel free to contact me at (303) 477-5915 with any questions.

Sincerely, AQUAWORKS DBO, INC.

Adam Sommers, P.E.

cc. Kevin Walker, District Manager Erick Worker, CDPHE GLU Project Manager

## Treatment and Distribution Improvements

## Construction Application Engineering Report



AquaWorks DBO, Inc. 3252 Williams Street Denver, CO 80205 (303) 477-5915



Arabian Acres Metropolitan District c/o Walker Schooler District Managers 614 N. Tejon Street Colorado Springs, CO 80903

Unincorporated Teller County, Colorado PWSID#CO-0160075

January 2020

## TABLE OF CONTENTS

TABLE	OF CONTENTS	i
ARRDE		;;;
ADDIL		111
EVECI		1
	Dreiget Dumogga	. 5
1. ว	L costien	. 5
2. 2.1		
2.1.	Area Map	
2.2.	Climate & Geography	
2.3.	Local and Regional Government Coordination	
3.	Service Area	6
3.1	Facilities Layout and Description	.8
3.1.	Growth Potential	.8
4.	Existing potable Water Treatment System	10
4.1.	Wells	10
4.2.	Treatment Buildings	11
4.3.	Distribution Network	11
4.4.	Condition of Existing Treatment Works	11
4.4.1.	Antiquated System Components	11
4.4.2.	Water Loss	12
4.5.	Sources of Potential Contamination	13
5.	Drinking Water Well Improvements	14
5.1.	Removing and Replacing the Two Existing Control Buildings	14
5.1.1.	Disinfection Calculations.	14
5.1.2.	Chlorinator Sizing Calculations	15
5.2.	New Water Storage Tank	15
5.3.	Well Improvements	16
5.4.	New Scada System	16
5.5.	Distribution System Improvements	16
6.	Water Rights	17
7.	Floodplain Considerations	17
8.	Implementation Plan	18
9	Project Schedule	18
10.	Engineer's Opinion of Probable Costs	19
10.1	Financing of Improvements	21
11	Operating Considerations $1/16/20$	21
12	Residuals Handling Plan	21
12.	Staffing and Operator Certification	21
1.5.	2)	- 1
REED		22
	INIX - SLIPPI EMENITAL INFORMATION	Δ
		11

#### FIGURES

Figure 1: USGS Topo	. 6
Figure 2: Control Building A Figure 4: Control Building B	12
Figure 5: Control Building B Interior	12
Figure 6: Floodplain Map	17
Figure 7: FEMA 100-year Floodplain Map	18
Figure 8: Engineer's Opinion of Probable Costs	20

#### TABLES

IN IDEED	
Table 1: Population Growth Estimate	9
Table 2: Well Summary	10
Table 3: Water Loss (2006-2010)	13
Table 4: Disinfection Log Inactivation Calculations	15
Table 5: Calculations Supporting a Plug Flow Baffle Factor of 1	15



## ABBREVIATIONS

(Not all may be included in this engineering report)

AWDBO	AquaWorks DBO, Inc.
AWWA	American Water Works Association
BDL	below detection level
CDPHE	Colorado Department of Public Health and Environment
cf	cubic feet
CPDWR	Colorado Primary Drinking Water Regulations
cy	cubic yards
ft	feet
g	grams
gpd	gallons per day
gpm	gallons per minute
gpy	gallons per year
Нр	horsepower
LS	lump sum
MCL	maximum contaminate level
MG	million gallons
MGD	million gallons per day
mg/L	milligrams per liter
min	minutes
N/A	not applicable
NaOCl	sodium hypochlorite
NS	not sampled
NSF 61	National Sanitary Foundation Standard 61
O&M	operation and maintenance
PER	Preliminary Engineering Report
ppm	parts per million
RTU	remote telemetry unit
SMCL	secondary maximum contaminate level
TDS	total dissolved solids
TSS	total suspended solids
VFD	variable-frequency drive
WTP	water treatment plant
WWTP	wastewater treatment plant
WQCD	Water Quality Control Division

## EXECUTIVE SUMMARY

The Arabian Acres Metropolitan District (District) provides potable water service to the Arabian Acres subdivision and Trout Haven Estates Filings 1, 3, 4, and portions of Filing 2. The District currently serves 150 taps with a population of approximately 405 people.

The District has faced considerable challenges over the past few years. These challenges include providing reliable service with the approximately 40 year old and poorly maintained distribution system that leaks considerably. Additionally, the District is in unsatisfactory financial condition due to the high cost to purchase water hauled from offsite to make up for the water loss. The intent of this Construction Application is to permit the following items:

This document recommends implementation of the following improvements:

- Item #1: Replace the two existing control (treatment) buildings.
- Item #2: Remove the existing 38,200 gallon water storage tank and replace it with a 100,000-gallon tank.
- Item #3: Redrill Well #3 and drill new Well #10
- Item #4: New SCADA System
- Item #5: Remove and replace portions of the existing distribution system

The improvements will allow the District to provide reliable, long-term potable water service to its users. Until the District can lower water loss to an industry acceptable level, it will continue to spend a considerable percentage of its revenue hauling water and responding to leaks and line breaks.

The construction budget for this project is \$2,500,000. The district will be seeking multiple funding sources, including a loan for \$1,500,000 from the State Revolving Fund program. It has been awarded a \$1,000,000 EIAF grant. The district does not propose increasing user rates with this project. It does propose reclassifying current monthly supplemental fees to debt service.

## ENGINEERING REPORT COMPONENTS

#### 1. PROJECT PURPOSES

The Arabian Acres is experiencing operational challenges with respect to raw water production, line losses, failing existing infrastructure, controlling equipment, freezing water lines, and raw water pumping capabilities. The District is committed to addressing these shortcomings with the existing system and in 2019 installed new water meters at each individual home as the first phase of the improvements.

The second phase of the improvements, distribution and treatment improvements, is being proposed with this project. The items proposed in this application are intended to remedy the continued challenges with the system.

#### 2. LOCATION

The project is located near the Florissant area of unincorporated Teller County, Colorado. It is approximately 3.5 miles southwest of Divide, Colorado. Access to the district is off of Twin Rocks Road. The center of the District is located at 38° 55′ 04″N, 105° 13′ 37″W. Site elevation is approximately 8,800 feet.

#### 2.1. Area Map

A three-mile radius map is included in the Appendix. The following is the USGS topo map for the service area:

#### Figure 1: USGS Topo



#### 2.2. Climate & Geography

The climate in the area is typical for the mountainous areas of Colorado. The prolonged duration of extreme cold temperatures experienced during the winter months requires special consideration when designing infrastructure, including adequate bury depths for underground pipes to prevent freezing. Elevations in the District area vary from approximately 8,800 to 9,200 feet ASL. There is a series of hydraulically connected lakes located on the east side of the District. The District's service area does not contain any mapped FEMA 100-year floodplains.

#### 2.3. Local and Regional Government Coordination

This project does not call for any new treatment facilities or increases to capacities of existing facilities. As such, consultation with local and regional governmental agencies such as Teller County or Pikes Peak Area Council of Governments will not be required for this project.

#### 3. SERVICE AREA

The Arabian Acres Metro District currently services most of Arabian Acres (229 lots) and some

of Trout Haven Estates (169 lots). Not all lots are developed and have a tap from the District. This includes 150 taps over a service area of approximately 0.85 square miles. It is anticipated that the boundaries of the current service area will remain unchanged for the next 20 years. Growth within the service area over that time is anticipated to be minimal (development of a few additional homes per year is expected to continue). The District has seen stagnant growth over the past few years. The full development of the total 398 lots is not probable because many estates are located on more than one lot.

Consumers in the District are predominantly single-family residences. Due to limited availability of water, the potential for water service outages, and the high cost for the District to haul water, the residents have become very efficient water users.

The water quality is generally good, and the District has not had any recent water quality compliance issues with the CDPHE, with the exception of one corrosion control sample which was due a broken chemical feed pump.





#### **3.1 FACILITIES LAYOUT AND DESCRIPTION**

Key elements of the existing distribution system include two drinking water treatment plants (Control Buildings A and B), a 38,200 gallon water storage/disinfection tank, nine wells, and distribution lines. Air relief valves, isolation valves, and blow off hydrants are also part of the distribution system.

#### 3.1. Growth Potential

The District currently has 150 active taps. Applying a standard rate of 2.7 people per tap yields

Arabian Acres Metropolitan District Construction Application Engineering Report 405 people within the District. This appears to be a realistic estimate based upon general observations by the District's operator.

The total number of buildable lots within the District is 389 (229 for Arabian Acres Subdivision and 169 for Trout Haven Estates). Build out of the full 389 lots is not realistic because many of the homes are on more than one lot. The District anticipates that there could be about 196 homes in Arabian Acres and 108 for Trout Haven Estates, combining for a total of 304 homes.

#### **Table 1: Population Growth Estimate**

	Taps:	Persons Per Tap:	<b>Estimated Population:</b>
Current	150	2.7	405 persons
Potential Build-Out	304	2.7	820 persons

While the ultimate build out of the District could be as large as 304 taps, reaching that size within the 20-year planning period is unlikely. There has been stagnant growth within the District for the past few years and there is no indication of upcoming projects that would add significant growth. It is probable that a small number of homes would be added to the system each year.

#### 4. EXISTING POTABLE WATER TREATMENT SYSTEM

The existing system consist of the following:

#### 4.1. WELLS

There are currently nine wells installed in the District. Water from the wells is treated in two locations. Control Building A treats Wells 1, 2, 6, 7, and 8. Control Building B treats Wells 3, 4, 5R, and 9. Control Building A feeds a 38,200 gallon disinfection/water storage tank with a 2 inch line. Control Building B discharges to a 12-inch PVC pipe loop which is approximately 90 feet long prior to the distribution system entry point.

Well #	Well Depth (Feet)	Control Building	Initial Rating (GPM)	Approx. Current Yield (GPM)
1 (Permit# 044597-F)	120	А	3	
2 (Permit# 74381-F)	300	А	2	Control Building A
6 (Permit# 053350-F)	300	А	4	Approximate Current Vield of 12 5
7 (Permit # 054114-F)	400	А	1.5	GPM (19 400 GPD)
8 (Permit# 055182-F)	380	А	3	
3 (Permit# 051210-F)	20	В	5	Control Building B
4 (Permit# 051408-F)	200	В	1.5	Approximate Current
5R (Permit# 68439-F)	600	В	0.75	Yield of 12.2 GPM
9 (Permit #77155-F)	600	В	5	(17,500 GPD)

#### **Table 2: Well Summary**

Water production rates of the existing wells have decreased over the years, at times making it difficult for the system to provide enough water to the residents. The problem results from the wells needing to produce extra water to make up for the distribution losses or occasional peak flow demands from the commercial taps. Current well production capacity based on current yields from Control Buildings A and B is about 25 GPM or 36,000 GPD. If the current production rate continues and water losses are minimized, there would be an adequate volume for the District's estimated demand of 19,700 GPD.

With the exception of drilling new groundwater wells and installing booster pumps, none of the recommended alternatives of this document increase water consumption or production capabilities (production rates will go down based on water savings). JDS Hydro concluded that drilling new wells is consistent with the District's water rights plan and that up to 17 wells can be developed within the District.

#### 4.2. TREATMENT BUILDINGS

Control Buildings A and B treat the raw water with a sodium hypochlorite solution. Soda ash is injected to prevent corrosion in the distribution system. The facilities consist of the buildings, flow measurement devices, and chemical metering pumps. The pumps are not flow paced and turn on and off based upon the active wells. Unlike Control Building A, Control Building B uses a bag filter to treat the raw water.

#### 4.3. DISTRIBUTION NETWORK

The existing distribution lines consist of a patchwork of differently sized pipes and materials. The pipes range from 2 inch to 6 inch and the materials include polyethylene, copper, and PVC (SDR35 and C900). The system has approximately 37,600 linear feet of piping.

The original system was installed between 1972 and 1979. There were upgrades made between 1990-1996, 1999-2000, and 2009-2010. The as-built records of these improvements are not thorough or complete. It is suspected that the installation methods and bury depths are not adequate. This is supported by the disproportionate amount of line break and water loss. Also, many piping connections are glued rather than connected with mechanical joints to accommodate settlement. The District anticipates that most of the distribution network will need to be replaced.

The network is not adequately looped, resulting in dead endings of lines, freezing from stagnant water, and lack of proper mixing, and this requires the shutdown of an entire line segment when repairs are required upstream. The distribution system improvements will include additional line segments adding loops to the system and creating redundancy.

Pressure reducing valves are installed in the network to reduce line pressure where required and these perform as though they were correctly installed.

Automatic read flow meters are installed at each home. Most water meters are installed in a pit outside the home. Some homes have water meters installed inside the home.

#### 4.4. CONDITION OF EXISTING TREATMENT WORKS

#### 4.4.1. ANTIQUATED SYSTEM COMPONENTS

The existing treatment and distribution systems have experienced deferred maintenance and the identified components are in need of rehabilitation.



Figure 3: Control Building A

**Figure 4: Control Building B** 

Figure 5: Control Building B Interior



#### 4.4.2. WATER LOSS

The volume of water loss, the difference between the amount of water treated and the amount sold, continues to be a significant problem for the District. There are two types of leaks

contributing to the problem. There are line breaks that drain a large amount of water over a period of days, weeks, or months until the leak is found. The District spent \$50,000 last year fixing leaks and hauling water. Due to the age of the system, a lack of proper bury depth, and improper installation techniques, the frequency of new leaks is increasing.

The following is a summary of water lost between 2006 and 2010:

Year	Water Loss
2006	35.76%
2007	52.59%
2008	52.17%
2009	48.54%
2010	33.79%

#### Table 3: Water Loss (2006-2010)

The District's records for 2010 to the present are incomplete. There was a change of management in 2012 and the previous management did not keep adequate logs. The available records are not fully reliable. For example, the records of water produced versus water sold are not separate from each other. The District is not comfortable reporting the water loss after 2010 and it estimates that water loss from 2010 to the middle of 2014 is in the range of the 2006-2010 percentages.

Distribution systems of this size typically have water losses of 5-10%, even with newer piping. The District's water losses often exceed the acceptable rates, resulting in operational and financial problems. The water losses often make the District unable to meet the demand of its users.

If implemented, removing and replacing the existing water lines would alleviate the water loss problems. The new HDPE water lines will be more leak resilient. Solving the distribution system's water loss problem will help solve many of the District's financial problems.

### 4.5. SOURCES OF POTENTIAL CONTAMINATION

The water quality of the existing wells has been under the required MCLs. There is no agriculture or industrial operations that contaminate the wells. The proposed improvements do not increase the potential for contamination.

#### 5. DRINKING WATER WELL IMPROVEMENTS

Key components and features of the system improvements include:

- Removing and replacing the two-existing control (treatment) buildings
- Removing the existing 38,200 gallon water storage tank and replacing it with a 100,000-gallon tank.
- Redrilling Well #3 and drilling new Well #10
- Install new SCADA system
- Removing and replacing portions of the existing distribution system

### 5.1. Removing and Replacing the Two Existing Control Buildings

The existing control buildings are in need of complete replacement. They were built as wooden shacks and do not have proper foundations, wood framing, or roofing. Further, components inside of the building have reached the end of their design life, are corroded, or both. The proposed project features demolishing the existing control buildings and replacing them with prefabricated fiberglass buildings manufactured offsite and delivered to the site complete with electrical and mechanical systems preinstalled. New treatment equipment will be installed inside of the proposed fiberglass buildings.

A hydraulic model of the existing system, including the wells, was created by AquaWorks DBO. The model shows that most of the existing well pumps are undersized. The well pumps convey water from the bottom of the wells to the top of the water storage tank. The undersized wells were designed to bring water from the bottom of the wells to ground level and don't account for the extra energy needed to bring the water from the ground level to the top of the water storage tank.

Remedying the situation with the undersized pumps can be achieved by installing a 5horsepower booster pump in each of the control buildings. The booster pump will take head pressure off of the well pumps and allow them to operate on their design curve. The hydraulic model shows that the instantaneous flow rate will double from 20 GPM to 40 GPM at each location.

#### **Disinfection Calculations** 5.1.1.

The application proposes installing new chlorine contact loops to achieve the required disinfection. The maximum instantaneous flow will be 40 GPM at each of the two control buildings. The SCADA system will be programmed to not allow more than 40 GPM to be pumped from the wells feeding the control buildings. Adequate contact time to meet the 4-log removal for viruses can be achieved in 120' of 10" HDPE contact piping using plug flow values. The calculations supporting this conclusion are as follows.

	Item	Number	Unit
1	Peak Instantaneous Flow (at each control building)	40	GPM
2	Temperature	5	С
3	BF—Baffling Factor	1	
4	рН	8	s.u.
5	Minimum Pipe Volume	320	Gallons
6	TDT—Theoretical Detention Time (Volume/Flow)	8	Minutes
7	Actual Detention Time (TDT x BF)	8	Minutes
8	Chlorine Residual Concentration (minimum)	1	mg/L
9	Virus Log Inactivation	4	log

#### **Table 5: Calculations Supporting a Plug Flow Baffle Factor of 1**

Item	Number	Unit/Notes
HDPE DR11 (10") Pressure Rating	200	psi
Inside Pipe Diameter	8.68	in
Pipe Volume per Foot	710	in <sup>3</sup>
Pipe Volume per Foot	3.052	gallons
Pipe Loop Length	120	feet
Volume Provided	366	gallons
Length/Diameter Ratio	165.89	Exceeds Minimum Ratio of 160
Min. Individual Segments	28.93	Pipe Segments of 60' Exceeds Minimum Length

Sodium hypochlorite is used to maintain a chlorine residual in the distribution system. The amount of chlorine injected by the chlorinators into the system can be adjusted to maintain the required residual; however, the district needs to be mindful not to exceed disinfection byproduct levels.

#### 5.1.2. Chlorinator Sizing Calculations

The district will install new chemical pumps of the same make and model as the existing pumps. The existing pumps are adequately sized to meet the 1 mg/L residual.

#### 5.2. NEW WATER STORAGE TANK

The existing water storage tank will be replaced with a larger version. The district looked at the cost for three different sized tanks: 60,000 gallons, 80,000 gallons, and 100,000 gallons. The incremental cost between the different tank sizes is not significant. For example, it costs 28% more for the 100,000 gallon tank than the 60,000 gallon tank; however, the capacity is 67% greater.

A final design of the tank meeting Design Criteria for Potable Water Systems is included in the design drawings.

#### 5.3. WELL IMPROVEMENTS

The hydraulic model shows that adding two booster pumps will allow the well pumps to perform as designed and will double the instantaneous flow rate capacity of the wells. As such, it is not as critical to install new water sources as thought in the project's Project Need Assessment or Capital Improvement Plan.

Work at two wells is proposed with this project. Well #3 is 20' deep. It was classified on January 8, 2019, by Bryan Pickle, CDPHE's Groundwater Evaluation Specialist, as a groundwater source; however, the district is not confident it will always be classified as a groundwater well. Redrilling Well #3 deeper will improve the chances it is never reclassified as GWUDI. The district's hydrologist concluded that drilling a new well (Well #10) near Control Building A would be a cost-effective way to increase water production. The costs to connect the new well to Control Building A will be minimized, as the two are located close to each other.

A memo from the project's hydrogeologist included in the Appendix summarizes the flow testing of the existing wells and projects the amount of flow each well can produce over time.

#### 5.4. NEW SCADA SYSTEM

A new cloud based SCADA system manufactured by Hightide Technologies will be installed. The SCADA system will turn the wells on and off based on the water storage tank level. The SCADA system will also turn the booster pumps on/off and report the flow rate. The SCADA system will turn wells off if either building is close to exceeding the 40 GPM used to size the disinfection piping. The three different sites will communicate via the Iridium low orbit satellite communication system. Alarms can be programmed to export to the operator's cell phone.

#### 5.5. DISTRIBUTION SYSTEM IMPROVEMENTS

A design for the removal and replacement of the district's entire distribution system is included with the engineering drawings. Due to budget constraints, not all of the distribution system can be upgraded with this part of the project. The length of line replacement that can be completed will be dependent upon the unit cost in the contractor's bids.

#### 6. WATER RIGHTS

The proposed project will not adversely affect the district's water rights. Please refer to the hydrologist's report in the Appendix summarizing how redrilling Well #3 and installing new Well #10 is consistent with the district's water rights plan.

#### 7. FLOODPLAIN CONSIDERATIONS

The district has reviewed the current FEMA floodplain map for the location. The district is Zone X, area of minimal flood hazard and not in a 100-year floodplain.



#### Figure 6: Floodplain Map

Arabian Acres Metropolitan District

Figure 7: FEMA 100-year Floodplain Map



### 8. IMPLEMENTATION PLAN

In order to implement the proposed upgrades, the following implementation plan, schedule, and operations plan establishes milestones for installing, starting up, and maintaining the proposed improvements.

The district will commence construction after it has all applicable permits, weather permitting. The proposed permitting, engineering, and construction activities include:

- Completing permitting and obtaining CDPHE Construction Application approval
- Applying for \$1,500,000 State Revolving Fund loan

### 9. PROJECT SCHEDULE

Construction of the improvements is anticipated to begin in the summer of 2020. The date of construction is dependent upon a number of factors, not all of which are under the control of the district.

The following milestones highlight the anticipated schedule. The final schedule is dependent upon a number of factors, such as approval time and weather:

- January 2020 Submit Construction Approval Application
  - February 2020 Submit SRF Loan Application
- March-April 2020 Bid Project

- May 2020 Close SRF Loan & Sign Agreement with Contractor
- June 2020 Begin Treatment & Distribution Improvements
- November 2020 Complete Treatment Improvements
- November 2021 Complete Distribution Improvements.

#### 10. ENGINEER'S OPINION OF PROBABLE COSTS

The construction budget for this project is \$2,500,000. The current availability and contractor pricing is extremely volatile due to a large number of projects and limited number of qualified water/wastewater contractors.

AquaWorks has prepared the following engineer's opinion of probable costs:

#### Figure 8: Engineer's Opinion of Probable Costs

Water Storage Tank Improvements				Cost:	\$	299,720
Water Storage Tank Addition. 100,000 gallons. Includes Site Work & Foundation.	1	Each	\$	205,000	\$	204,000
Additional Tank Level Control	1	Each	\$	32,000	\$	32,000
Contractor Overhead & Profit	12%				\$	28,320
Bidding, SRF Administration, & Construction Engineering Consulting	5%				\$	11,800
Contingency	10%				\$	23,600
Drinking Water Treatment Improvements				Cost:	\$	375,920
Drilling New Well Near Control Building A	1	Each	\$	30,000	\$	30,000
Redrill Well #3	1	Each	\$	30,000	\$	30,000
Well/Treatment Building Improvements (Control Buildings A & B)	2	Each	\$	100,000	\$	200,000
Install Chlorine Contact Piping	240	Feet	\$	150	\$	36,000
Contractor Overhead & Profit	12%				\$	35,520
Bidding, SRF Administration, & Construction Engineering Consulting	5%				\$	14,800
Contingency	10%				\$	29,600
Existing Distribution System Improvements (Replacement for System Except C900 for Trout Have	en)			Cost:	\$	4,322,624
Replace Existing Water Lines with 4" HDPE (maintain bury depth) <sup>1</sup>	30,000	Feet	\$	100	\$	3,000,000
• Allowance for Gate Valves, Hydrants, and Air Relief Valves / Pressure Relief (10% of Line Work	10%				\$	300,000
Restore Gerka Ln to Lower Gerka Ln Loop	720	Feet	\$	100	\$	72,000
<ul> <li>Allowance for Gate Valves, Hydrants, and Air Relief Valves (10% of Line Work)</li> </ul>	10%				\$	7,200
Contractor Overhead & Profit	12%				\$	405,504
Bidding, SRF Administration, & Construction Engineering Consulting					\$	200,000
Contingency	10%				\$	337,920
Cost Per Foot of Water Line (Includes cost per foot + 10% for valves + O&P + Construction Engineer	ing +Continge	ncy)			\$	141
			Gra	nd Total:	\$	4,998,264
AquaWorks Recommends the Following Improvements for a \$2,50	0,000 Project	Budge	t			
V	/ater Storage	Tank Ir	npro	ovements	\$	299,720
D	rinking Water	Well Ir	npro	ovements	\$	375,920
				Subtotal:	\$	675,640
Budget for Distribution System Improvement	s (Total Proje	ct Budg	et -	Subtotal)	\$	1,824,360
Work on Distribution System will be bid as "Unit Price" per foot of water line. Work complete	ed dependent	upon	Unit	Price fror	<u>n co</u>	<u>ntractor.</u>
At \$141 per foot (including water line, valves, O&P, Construction Engineering, Contingency) feet completed:						
At \$130 per foot (including water line, valves, O&P, Construction Engineering, Contingency) feet completed:						
At \$120 per foot (including water line, valves, O&P, Construction Engineering, Contingency) feet completed:						15,203
At \$100 per foot (including water line, valves, O&P, Construction Engineering, Contingency) feet completed:						
At \$90 per foot (including water line, valves, O&P, Construction Engineering, Contingency) feet completed:						

Completing all the work identified by AquaWorks in the capital improvement plant is estimated to cost \$5,000,000, twice the proposed project budget. As such, the district has prioritized components of improvements. The district will complete the water storage tank replacement, new SCADA system, drill the two wells, replace the control buildings, and replace segments of the distribution system identified by the board of directors as having the highest priority. The linear feet of water line the district can remove and replace will not be known until contractors' bids are received. The water line will be bid on a unit cost basis (price per linear foot). The district anticipates about \$1,824,360 of the construction budget will be available for distribution replacement. Several scenarios for the amount of line work to be completed are included in the opinion of cost based on possible contractor pricing. 12,939 feet out of a total 30,000 feet of line can be replaced if the bid price is \$141 per linear foot.

#### 10.1. Financing of Improvements

The district has already been awarded a \$10,000 Planning and Design Grant, a \$300,000 Design and Engineering Grant, and a \$1,000,000 DOLA EIAF Grant. The \$1,310,000 in grants will be matched with the \$1,500,000 SRF loan for a total project budget including design fees of \$2,810,000. The SRF loan application is being submitted concurrent with the Construction Application.

#### **11. OPERATING CONSIDERATIONS**

There are no incremental additions proposed with this project that will affect the operations of the system. In fact, the amount of operations time required will likely go down. The treatment process is very basic because it is a groundwater system with no additional treatment for contaminants. The same two chemicals will be used for disinfection and corrosion control. The operator will spend less time locating and repairing broken and leaking lines. The replacement SCADA system will improve the controls of the different wells. The additional water generated by the improved system will result in less operator involvement to make the minimum amount of water needed for the residents.

#### 12. RESIDUALS HANDLING PLAN

Not applicable. The project will not generate residuals.

### 13. STAFFING AND OPERATOR CERTIFICATION

The system is classified as a community water system and must be operated in accordance with CDPHE policies. The water system's Operator-in-Responsible Charge is a contract operator, Lynn Willow, and maintains an "S" certification (#20621) and "C" (#26174). His certifications meet the requirements for this project.

## REFERENCES

Colorado Department of Public Health and Environment, Water Quality Control Division (May 1, 2015). *Colorado Primary Drinking Water Regulations, Regulation No. 11.* 

Colorado Department of Public Health and Environment, Water Quality Control Division (September 1, 2013). *Design Criteria for Potable Water Systems*.

Colorado Department of Public Health and Environment, Water Quality Control Division. *New Water System Capacity Planning Manual.* 

United States Environmental Protection Agency (2017). *Safe Drinking Water Information System (SDWIS)*. Retrieved January 10, 2020 from <u>https://enviro.epa.gov/enviro/sdw\_report\_v3.first\_table?pws\_id=CO0160075&state=CO&source</u> <u>=Ground%20water&population=325&sys\_num=0</u>

## **APPENDIX – SUPPLEMENTAL INFORMATION**

- Basis of Design Application Form
- 3 Mile Radius Map
- Geotechnical Report
- Engineering Drawings
- Project Specifications
- Arabian Acres Water Supply Study (Jehn Water Consultants, Inc. dated December 18, 2019)



# COLORADO

Department of Public Health & Environment APPENDIX B: BDR Template Drinking Water Design Submittal Safe Drinking Water Program Implementation Policy #5

4300 Cherry Creek Drive South, B2 Denver, Colorado 80246-1530 CDPHE.WQEngReview@state.co.us, 303-692-6298

### COVER PAGE - BASIC INFO

A. Project and System Infor	mation							
System Name	Arabian Acres Metropolitan District							
Project Title	Treatm	Treatment & Distribution Improvements						
County	Teller	County						
PWSID	CO-016	50075						
System Owner	Arabia	n Acres Metropolitan Distri	ct					
Representative	Edith C	Coffman, Board President						
Addross	c/o Wa	c/o Walker Schooler District Managers						
Address	614 N.	614 N. Tejon St, Colorado Springs, CO 80903						
Email	edith@aametro.net							
Phone	(719) 5	) 505-3823 Fax						
Signatures of System Repres	entatives							
Role	Date	Typed Name		Si	gnature			
Board President		Edith Coffman						
The owner is an individual, corporation, partnership, association, state or political subdivision thereof, municipality, or other legal entity.								
Applicant / System Legal Representative								
The system legal representative a board, public works director).	is the legally The Designer	responsible agent and decision-m r or Consulting Engineer is not the	aking authority legal represer	y for a public water : ntative.	system (e.g. mayor, president of			

<u>Directions</u>: Prior to submission to the department, the construction application must be signed by the Owner and/or a System Legal Representative. The department expects the public water system to send a duplicate copy to the local county health authority or county commissioner (if no county health authority) in whose jurisdiction(s) the drinking water facility is to be located. Signature is not required from the county.

I was the engineer in responsible charge for (identify portions of work)

Drawings and reports bearing my seal.

during the preparation of the basis of design report for the above-referenced project. To the best of my knowledge, the design is consistent with the most recent published version of the *Design Criteria for Potable Water Systems*, and that all site-specific deviations requests are listed in this report.

Adam Sommers	1/14/2020	ADO LICE
Typed Name of Professional Engineer	Date Signed	A C IN SO MULLER
Adam Jonney C	38,169	9 7 38169 8 g
Signature of Professional Engineer	License #	0 1/14/2020 <i>H</i>
		SIONAL ENG

P.E. Stamp and Signature

Revised Dec 2017

Drinking Water Design Application Form



## **COLORADO** Department of Public Health & Environment

#### APPENDIX B: BDR Template Drinking Water Design Submittal Safe Drinking Water Program Implementation Policy #5

4300 Cherry Creek Drive South, B2 Denver, Colorado 80246-1530 <u>CDPHE.WQEngReview@state.co.us,</u> 303-692-6298

#### **COVER PAGE - BASIC INFO**

A. Project and System Inf	formation								
System Name	Arabian Ac	Arabian Acres Metropolitan District							
Project Title	Treatment	& Distribution Impro	vements						
County	Teller Cou	Teller County							
PWSID	CO-016007	CO-0160075							
System Owner	Arabian Ac	Arabian Acres Metropolitan District							
Representative	Edith Coffr	Edith Coffman, Board President							
Address	c/o Walker	c/o Walker Schooler District Managers							
Address	614 N. Tej	614 N. Tejon St, Colorado Springs, CO 80903							
Email	edith@aam	netro.net							
Phone	(719) 505-3	3823	Fax						
Signatures of System Rep	resentatives								
Role	Date	Typed Name	-	Signature					
Board President	1/15/20	Edith Coffman	Sa	ite Coffman					
The owner is an individual, co	prporation, partnershi	ip, association, state or po	litical subdivision the	reof, municipality or other legal entity.					
Applicant / System Legal									
			making authority for	a public water surfam (e.e. mayor provident of					
The system legal representative a board, public works director irections: Prior to submissio epresentative. The departm punty commissioner (if no co	ve is the legally response r). The Designer or C non to the departme ment expects the pro- pounty health author	onsible agent and decision consulting Engineer is not i ent, the construction ap ublic water system to s rity) in whose jurisdicti	plication must be si end a duplicate cop on(s) the drinking w	igned by the Owner and/or a System Legal y to the local county health authority or vater facility is to be located. Signature is					
The system legal representative The system legal representati a board, public works director irections: Prior to submissic epresentative. The departm ounty commissioner (if no co ot required from the county, was the engineer in responsi	ve is the legally respondent r). The Designer or C con to the department ment expects the pro- pounty health author ible charge for (ide	entify portions of work)	the legal representativ plication must be si end a duplicate copy on(s) the drinking w	igned by the Owner and/or a System Legal y to the local county health authority or ater facility is to be located. Signature is					
The system legal representative The system legal representati a board, public works director irrections: Prior to submissic epresentative. The departm punty commissioner (if no co ot required from the county, was the engineer in responsi- uring the preparation of the possistent with the most rece	ve is the legally respondent r). The Designer or C contropy the department of the department openty health author bible charge for (ide design report basis of design report of design report of design report of design report	onsible agent and decision consulting Engineer is not i ent, the construction ap ublic water system to s rity) in whose jurisdicti entify portions of work) Drawings and reports be port for the above-refer on of the Design Criteri	earing my seal. renced project. To t a for Potable Water	he best of my knowledge, the design is					
The system legal representative The system legal representati a board, public works director irections: Prior to submissic epresentative. The departm bunty commissioner (if no co but required from the county) was the engineer in responsi uring the preparation of the possistent with the most rece eviations requests are listed Adam Sommers	ve is the legally respo r). The Designer or C on to the departme nent expects the pu punty health author ible charge for (ide basis of design rep int published versio in this report.	onsible agent and decision consulting Engineer is not it ent, the construction ap- ublic water system to s rity) in whose jurisdicti entify portions of work) Drawings and reports bi- port for the above-refer on of the Design Criteri 1/1	earing my seal. enced project. To t a for Potable Water 4/2020	a public water system (e.g. mayor, president of e. gned by the Owner and/or a System Legal y to the local county health authority or rater facility is to be located. Signature is the best of my knowledge, the design is <i>Systems</i> , and that all site-specific					
The system legal representative The system legal representation a board, public works director irections: Prior to submissioner presentative. The departmounty commissioner (if no co- bot required from the county was the engineer in responsion uring the preparation of the insistent with the most rece- eviations requests are listed Adam Sommers The Manual Comments	ve is the legally respondent of the legally respondent of the department expects the property health authory is the charge for (ide the second of the depart of the second	onsible agent and decision consulting Engineer is not it ent, the construction ap- ublic water system to s rity) in whose jurisdicti entify portions of work) Drawings and reports be port for the above-refer on of the <i>Design Criteri</i> <u>1/1</u> Date Si	earing my seal. earing my seal. earing my seal. earing my seal. earing my active the formation of the format	the best of my knowledge, the design is Systems, and that all site-specific					
The system legal representative The system legal representative irections: Prior to submissic epresentative. The departmounty commissioner (if no co ot required from the county, was the engineer in responsi- uring the preparation of the consistent with the most rece eviations requests are listed Adam Sommers yped Na gnature of Professional Engineeries gnature of Professional Engineeries	ve is the legally respondent of the legally respondent expects the property health authority health authorit	onsulting Engineer is not 1 consulting Engineer is not 1 ent, the construction ap ublic water system to s rity) in whose jurisdicti entify portions of work) Drawings and reports be port for the above-refer on of the Design Criteri 1/1 Date Si 38,16 License	earing my seal. earing my seal. earing my seal. earing my seal. earing dropet. To ta a for Potable Water 4/2020 gned 9 #	the best of my knowledge, the design is <i>Systems</i> , and that all site-specific <i>Build of the state of the second </i>					
The system legal representative The system legal representative irrections: Prior to submissic epresentative. The departmounty commissioner (if no co ot required from the county. was the engineer in responsi- uring the preparation of the onsistent with the most rece eviations requests are listed Adam Sommers yped Na gnature of Professional Enginerer ignature of Professional Enginerer professional Enginer professional Eng	ve is the legally respondent of the legally respondent of the department expects the property health authority health authori	consulting Engineer is not it consulting Engineer is not it ent, the construction ap ublic water system to s rity) in whose jurisdicti entify portions of work) Drawings and reports be port for the above-refer on of the Design Criteri 1/1 Date Si 38,16 License	earing my seal. earing my seal. earing my seal. earing my seal. earing de project. To t a for Potable Water 4/2020 gned 9 #	The best of my knowledge, the design is systems, and that all site-specific					

#### Basis of Design Report (BDR) Submittal Checklist

In accordance with Regulation 11 and the Design Criteria for Potable Water Systems, the design review process must include a 'complete design' consisting of a basis of design report (BDR) and corresponding plans and specifications for review and approval by the Department.

Project and System Information								
Project Title	Treatment & Dia	stribution Improve	ements					
System Name	Arabian Acres Metropolitan District							
PWSID	CO-0160075							
County	Teller County							
Date of Design Submittal	1/17/2020							
Project Eligible for Streamlined Review? (See Appendix A Design Review Matrix)	Yes		No					
			Applicant	to fill out				
Section Number and Basis of Design Rep	ort Requirements		Included/ Addressed in Submittal? Yes/No/NA	Location in Submittal (BDR, Plans, Other document)				
1. Basic Project Information - REQUIRED	FOR ALL SUBMITT	ALS	Yes	BDR				
2. Sources of Potential Contamination			NA					
3. Water Quality Data			NA	Will be provided after new wells are installed				
4. Process Flow Diagram/ Hydraulic Prof	ïle		Yes	Engineering Drawings				
5. Capacity Evaluation and Design Calcul	lations		Yes	Engineering Report				
6. Monitoring and Sampling Evaluation			NA					
7. Geotechnical Report			Yes	Engineering Report				
8. Residuals Handling	_		NA					
9. Preliminary Plan of Operation			Yes	Engineering Report				
10. Impact to Corrosivity			NA					
11. Supplemental or Other Pertinent Inf		Yes	Engineering Report					
Plans and Specifications								
1. Plans and % complete (60%, 90%)	Yes Treatment Design = 100% Distribution Design = 90%	Engineering Drawings						
2. Other schematics NA								
3. Specifications	Yes - 90%	Project Specifications						

#### Section 1: Application for Construction Approval Form (DCPWS Section 1.2.1)

A. Project and System Information									
Project Title		Treatment & Distribution Improvements							
PWSID (Assigned by Division)		CO-0160075							
Design Company Name	Aqu	AquaWorks DBO, Inc.							
Design Engineer	Ada	Adam Sommers, P.E. CO License Number 38,169							
Address	325	2 Will	iams Street						
Address	Den	ver, (	CO 80205						
Email	ada	m@ac	uaworksdbo.com						
Phone	(303	3) 477	/-5915		Fax				
B. Public Water System (PWS)	B. Public Water System (PWS) Type     Community (CWS)							Transient, Non- Community (TNC)	
C. Current Primary Source Classification			Surface Water/ GWUDI		Ground Water (GW)			Consecutive / Purchased	
D. Design Submittal Scope (Ch	ieck al	I that	apply)						
Source Treatment Facility				Storage Tank			- · · ·		
Source			Treatment Facilit	<u>y</u>	Storage Tan	k		Other	
New ground water (GW) source		New	Treatment Facilit	y   🗆	Storage Tan New Distribution System Tank		R	Other Response to Sanitary Survey	
New ground water (GW) source New ground water under the direct influence of surface water (GWUDI) source		New Expa trea	Treatment Facility Treatment Facility ansion of existing tment facility		Storage Tan           New Distribution           System Tank           New Tank used           for disinfection           contact time		R S R E	Other Response to Sanitary Survey Response to Enforcement Order	
New ground water (GW) source New ground water under the direct influence of surface water (GWUDI) source New surface water (SW) source		New Expa trea Mod trea	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment	y	Storage Tan           New Distribution           System Tank           New Tank used           for disinfection           contact time           Modifications to           existing tank		R S R E S (	Other Response to Sanitary Survey Response to Enforcement Order State Revolving Fund SRF) Project	
New ground water (GW) source New ground water under the direct influence of surface water (GWUDI) source New surface water (SW) source Existing source modification		New Expa trea Mod trea	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment		Storage Tan           New Distribution           System Tank           New Tank used           for disinfection           contact time           Modifications to           existing tank		R S R E S (( T N E	Other Response to Sanitary Survey Response to Enforcement Order State Revolving Fund SRF) Project Technical, Managerial, Financial Evaluation	
New ground water (GW)         source         New ground water under the         direct influence of surface         water (GWUDI) source         New surface water (SW)         source         Existing source modification         Other (Please describe)		New Expa trea Mod trea	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment		Storage Tan           New Distribution           System Tank           New Tank used           for disinfection           contact time           Modifications to           existing tank		R S R E S (( T N E	Other Response to Sanitary Response to Enforcement Order State Revolving Fund SRF) Project Technical, Managerial, Financial Evaluation	
Source         New ground water (GW)         source         New ground water under the         direct influence of surface         water (GWUDI) source         New surface water (SW)         source         Existing source modification         Other (Please describe)         E. Estimated Project Schedule		New Expa trea Mod trea	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment	y	Storage Tan         New Distribution         System Tank         New Tank used         for disinfection         contact time         Modifications to         existing tank		R E S (( T N E ns ir	Other Response to Sanitary Survey Response to Enforcement Order State Revolving Fund SRF) Project Technical, Managerial, Financial Evaluation	
Source         New ground water (GW)         source         New ground water under the         direct influence of surface         water (GWUDI) source         New surface water (SW)         source         Existing source modification         Other (Please describe)         E. Estimated Project Schedule         Estimated Bid Opening Date		New Expa trea Mod trea	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment stimate g 2020	y	Storage Tan         New Distribution         System Tank         New Tank used         for disinfection         contact time         Modifications to         existing tank		R S R S (( T N E ns ir	Other Response to Sanitary Survey Response to Enforcement Order State Revolving Fund SRF) Project Technical, Managerial, Financial Evaluation	
Source         New ground water (GW)         source         New ground water under the         direct influence of surface         water (GWUDI) source         New surface water (SW)         source         Existing source modification         Other (Please describe)         E. Estimated Project Schedule         Estimated Bid Opening Date         Estimated Completion Date		New Expa trea Mod trea Cost E Sprin Fall 2	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment stimate g 2020 2021	y	Storage Tan         New Distribution         System Tank         New Tank used         for disinfection         contact time         Modifications to         existing tank		R 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Other         Response to Sanitary         Survey         Response to         Enforcement Order         State Revolving Fund         SRF) Project         Technical,         Managerial, Financial         Evaluation         n Section 5)         00 Gallons	
Source         New ground water (GW)         source         New ground water under the         direct influence of surface         water (GWUDI) source         New surface water (SW)         source         Existing source modification         Other (Please describe)         E. Estimated Project Schedule         Estimated Completion Date         Estimated Project Cost		New Expa trea Mod trea Cost E Sprin Fall 2 \$2,50	Treatment Facility Treatment Facility ansion of existing tment facility ification to existing tment stimate g 2020 2021 00,000	y F. Mir Mo Pea	Storage Tan         New Distribution         System Tank         New Tank used         for disinfection         contact time         Modifications to         existing tank         Rated Capacity (Calculation)         nimum Flow         nthly Average         ak Hour Flow	k 	R 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Other         Response to Sanitary         Survey         Response to         Enforcement Order         State Revolving Fund         SRF) Project         Technical,         Managerial, Financial         Evaluation         In Section 5)         00 Gallons         M	

The Arabian Acres Metropolitan District (District) provides potable water service to Arabian Acres subdivision and Trout Haven Estates Filings 1, 3, 4, and portions of Filing 2. The District currently serves 150 taps with a population of approximately 405 people.

The District has faced considerable challenges over the past few years. These challenges include providing reliable service with the approximately 40 year old, poorly maintained distribution system that leaks considerably. Additionally, the District is in unsatisfactory financial condition due to the high cost to purchase water hauled from offsite to make up for the water loss. The intent of this Construction Application is to permit the following items:

This document recommends implementation of the following improvements:

- Item #1: Replace and replacing the two- existing control (treatment) buildings.
- Item #2: Remove the existing 38,000 gallon water storage tank and replacing it with a 100,000-gallon tank.
- Item #3: Redrill Well #3 and drilling new Well #10
- Item #4: New SCADA System
- Item #5: Removing and replacing portions of the existing distribution system

The improvements will allow the District to provide reliable, long-term potable water service to the users. Until the District can lower water loss to an industry acceptable level, it will continue to spend a considerable percentage of its revenue hauling water and responding to leaks and line breaks.

The conceptual engineer's opinion of probable costs for this project is \$1,000,000. This opinion of cost includes replacing and upgrading 10% of the distribution system for Item #1 and Item #2 to Item #5 from the list of improvements. This balances financial limitations with the most cost effective alternatives. Improvements can be completed approximately 12 months from the time funding is available.

Н. 50	aleu Map		
	see Engineering Drawings		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	elementation Dian and Cabadula		
1. IM	plementation Plan and Schedule		
	see Engineering Report		
1			
1			
J. Re	equested Deviations		
	DCPWS Requirement	Site Specific Deviation Request	Location in
	(e.g., Section 4.3 Redundant	(additional information can be included in the supplemental information	Submittal
No.	filters)	section see 1.2.10 of the DCPWS)	(page)
1			
2			
2			
3			
4			
-			
F			
5			
6			
7			
1			

Section 2: Sources	s of Potential	Contamination	(DCPWS	Section 1.2.2)
--------------------	----------------	---------------	--------	----------------

#### Project Title: Arabian Acres Treatment & Distribution Improvements

#### 100 Year Flood Plain

All water facilities must have the potential 100-year flood threat evaluated based on all available floodplain data from one or more of the following sources: the Colorado Water Conservation Board, U.S. Army Corps of Engineers, Housing and Urban Development, County Government, local flood districts, etc. A copy of any background information used in the 100-year flood threat determination process must be included along with a comparison of the site vertical elevation datum and floodplain reference elevation datum.

The 100-year flood threat was evaluated for:

(e.g. Well, Water Treatment Facility, Tank)

100-year flood threat determination was based on the information enclosed from:

(e.g. FEMA floodplain map, U.S. Army Corp, elevation)

For Non-Community Public Water Systems, an authorized representative of the system responsible for operation and compliance must sign the Floodplain Certification.

I hereby certify that a judgment has been made after evaluating all available floodplain data and in my opinion, these waterworks, as located and designed, are not subject to flood damage by a 100-year event.

Typed Name of Authorized System Representative

Date Signed

Signature of Authorized System Representative

For Community Systems, a Professional Engineer licensed in Colorado must stamp and sign the Floodplain Certification.

I hereby certify that a Professional Engineering judgment has been made after evaluating all available floodplain data and in my professional opinion, these waterworks, as located and designed, are not subject to flood damage by a 100-year event.

Typed Name of Professional Engineer

Date Signed

Signature of Professional Engineer

License #

**Contamination Sources** 

The project does not affect the contamination potential.

Mitigation Strategy
Not Applicable.

#### Section 3: Water Quality Data (DCPWS Section 1.2.3)

Project Title: Arabian Acres Treatment & Distribution Improvements

Source Data

Water quality data for two consecutive quarters for the redrill of Well #3 and Well #10 will be provided after the wells are installed.

Process Selection Data

See Engineering Report

Other Pertinent WQ or Operational Data

See Engineering Report

Project Title: Arabian Acres Treatment & Distribution Improvements

Process Flow Diagram

See Engineering Drawings

Hydraulic Profile See Engineering Drawings.

ection 5: Capacity Evaluation and Design Calculations (DCPWS Section 1.2.5)								
Project Title: Arabian Acres Treatment & Distribution Improvements								
Discussion of calculations included								
See Engineering Rep	port							
Unit Processes								
hypochlorite addition)	U	Init Process [	Description at Rated Ca	pacity				
Disinfection	Itom			Number	Linit			
	1 Deek Instanteneeus		h control building)	Number 40	CDM			
	1 Peak Instantaneous	Flow (at eac	n control building)	40	GPIVI			
	2 PE Paffling Factor			1	C			
	2 nH			1	S II			
	5 Minimum Pipe Volur	ne		320	Gallons			
	6 TDT—Theoretical De	etention Tim	e (Volume/Flow)	8	Minutes			
	7 Actual Detention Tin	ne (TDT x BF	)	8	Minutes			
	8 Chlorine Residual Co	ncentration	(minimum)	1	mg/L			
	9 Virus Log Inactivatio	n		4	log			
Plug Flow								
	Item	Number	Unit/Notes					
	HDPE DR11 (10")							
	Pressure Rating	200	psi					
	Inside Pipe Diameter	8.68	in					
	Pipe Volume per Foot	710	in <sup>3</sup>					
	Pipe Volume per Foot	3.052	gallons					
	Pipe Loop Length	120	feet					
	Volume Provided	gallons						
	Length/Diameter Ratio	atio of 160						
	Min. Individual Segments	)' Exceeds N	Ainimum Length					
Sampling locations and parameters to be monitored See Engineering Drawings

Discussion of control strategy See SCADA Plan

Geotechnical report

See Engineering Report

Residuals handling plan - Chapter 9 of the DCPWS Not applicable. Project does not generate residuals.

Staffing and Operator Certification See Engineering Report

Operating Considerations See Engineering Report

Project Category (Category 1 - 4: see Appendix A, Table A.2 for Category descriptions. (Add justification for category changes here)

No changes are proposed to corrosion control measures.

Impacts to Corrosivity (Category 2 and 3. Category 4 submit Appendix K) -

Category 2: Confirm materials evaluation and proper sampling pool (Regulation 11.26(2)) Category 3: Submit evaluation of project's impact to corrosivity Category 4: New OCCT or changes to existing OCCT - submit Appendix K of the DCPWS)

roject Title:			
upplemental Information	n		
See Engineering Re	port		
dditional Deviation Req	uest Information		

Plans Description and key sheets

See Engineering Drawings

Pertinent Specifications for Design

See Project Specifications

ATTACH PLANS AND INCLUDE SPECS.





Kumar & Associates, Inc.® Geotechnical and Materials Engineers and Environmental Scientists

6735 Kumar Heights Colorado Springs, CO 80918 phone: (719) 632-7009 fax: (719) 632-1049 email: kacolospgs@kumarusa.com www.kumarusa.com

#### An Employee Owned Company

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado



### GEOTECHNICAL ENGINEERING STUDY ARABIAN ACRES METROPOLITAN DISTRICT PROPOSED WATER SYSTEM IMPROVEMENTS TELLER COUNTY, COLORADO

Prepared By: Jake D. Cochran, P.E.



Reviewed By: Arben F. Kalaveshi, P.E.

Prepared for:

Arabian Acres Metropolitan District PO Box 147 Colorado Springs, Colorado 80901

Attn: Ms. Jennifer Waller, President

May 10, 2019

PURPOSE AND SCOPE OF WORK.2PROPOSED CONSTRUCTION2SITE CONDITIONS2FIELD EXPLORATION3LABORATORY TESTING3SUBSURFACE CONDITIONS3FOUNDATION RECOMMENDATIONS.4PIPE BACKFILL6SEISMIC DESIGN CRITERIA7WATER SOLUBLE SULFATES7SURFACE DRAINAGE7EXCAVATION CONSIDERATIONS.8DESIGN AND SUPPORT SERVICES.9LIMITATIONS9	SUMMARY	. 1
PROPOSED CONSTRUCTION       2         SITE CONDITIONS       2         FIELD EXPLORATION       3         LABORATORY TESTING       3         SUBSURFACE CONDITIONS       3         FOUNDATION RECOMMENDATIONS       4         PIPE BACKFILL       6         SEISMIC DESIGN CRITERIA       7         WATER SOLUBLE SULFATES       7         SURFACE DRAINAGE       7         EXCAVATION CONSIDERATIONS       8         DESIGN AND SUPPORT SERVICES       9         LIMITATIONS       9	PURPOSE AND SCOPE OF WORK	. 2
SITE CONDITIONS	PROPOSED CONSTRUCTION	. 2
FIELD EXPLORATION       3         LABORATORY TESTING       3         SUBSURFACE CONDITIONS       3         FOUNDATION RECOMMENDATIONS       4         PIPE BACKFILL       6         SEISMIC DESIGN CRITERIA       7         WATER SOLUBLE SULFATES       7         SURFACE DRAINAGE       7         EXCAVATION CONSIDERATIONS       8         DESIGN AND SUPPORT SERVICES       9         LIMITATIONS       9	SITE CONDITIONS	. 2
LABORATORY TESTING	FIELD EXPLORATION	. 3
SUBSURFACE CONDITIONS       3         FOUNDATION RECOMMENDATIONS       4         PIPE BACKFILL       6         SEISMIC DESIGN CRITERIA       7         WATER SOLUBLE SULFATES       7         SURFACE DRAINAGE       7         EXCAVATION CONSIDERATIONS       8         DESIGN AND SUPPORT SERVICES       9         LIMITATIONS       9	LABORATORY TESTING	. 3
FOUNDATION RECOMMENDATIONS       4         PIPE BACKFILL       6         SEISMIC DESIGN CRITERIA       7         WATER SOLUBLE SULFATES       7         SURFACE DRAINAGE       7         EXCAVATION CONSIDERATIONS       8         DESIGN AND SUPPORT SERVICES       9         LIMITATIONS       9	SUBSURFACE CONDITIONS	. 3
PIPE BACKFILL       6         SEISMIC DESIGN CRITERIA       7         WATER SOLUBLE SULFATES       7         SURFACE DRAINAGE       7         EXCAVATION CONSIDERATIONS       8         DESIGN AND SUPPORT SERVICES       9         LIMITATIONS       9	FOUNDATION RECOMMENDATIONS	. 4
SEISMIC DESIGN CRITERIA	PIPE BACKFILL	. 6
WATER SOLUBLE SULFATES	SEISMIC DESIGN CRITERIA	. 7
SURFACE DRAINAGE	WATER SOLUBLE SULFATES	. 7
EXCAVATION CONSIDERATIONS	SURFACE DRAINAGE	. 7
DESIGN AND SUPPORT SERVICES	EXCAVATION CONSIDERATIONS	. 8
LIMITATIONS	DESIGN AND SUPPORT SERVICES	. 9
	LIMITATIONS	. 9

## TABLE OF CONTENTS

FIGS. 1 THROUGH 1C – LOCATION OF EXPLORATORY BORINGS FIG. 2 – LOGS OF EXPLORATORY BORING FIG. 3 – LEGEND AND NOTES FIGS. 4 THROUGH 6 – GRADATION TEST RESULTS

TABLE I - SUMMARY OF LABORATORY TEST RESULTS

#### SUMMARY

- 1. The borings generally encountered granular overburden soils consisting of well graded sand with clay and gravel to clayey sand with gravel extending to approximately 2 to 9.5 feet below the existing grade. The overburden soils were underlain by sandstone bedrock in Boring 1 and weathered granite bedrock in Borings 2 through 4. The bedrock extended to the maximum depths explored of 18 to 20 feet below grade. Practical Auger Refusal was encountered in Boring 4 at 18 feet.
- 2. Groundwater was encountered in Borings 1 and 2 at depths of 7.4 and 4.9 feet at the time of drilling. Groundwater was not encountered in the remaining borings. We anticipate that the depth to groundwater will fluctuate over time.
- 3. It is our opinion a shallow foundation bearing on a minimum of 1 foot of properly compacted structural fill will perform adequately for the proposed precast fiberglass buildings. Footings bearing on the granular overburden soils should be designed for a maximum allowable bearing pressure of 2,000 psf, and with the other design and construction considerations presented in this report.
- 4. We understand that the proposed water tank will be constructed on a concrete ring foundation. The ring foundation should bear on the undisturbed weathered granite bedrock. Footings bearing on undisturbed bedrock should be designed for a maximum allowable bearing pressure of 5,000 psf, and with the other design and construction considerations presented in this report.

#### PURPOSE AND SCOPE OF WORK

This report presents the results of a geotechnical engineering study for the proposed Arabian Acres Metropolitan District's proposed water distribution system improvements within the Arabian Acres Subdivision in Teller County, Colorado. The project site is shown on Fig. 1. This study was conducted in accordance with the scope of work in our Proposal No. C19-140 dated March 7, 2019, to develop recommendations for the proposed construction.

This report has been prepared to summarize the data obtained during this study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to the proposed construction are included in the report.

#### PROPOSED CONSTRUCTION

We understand the proposed construction will consist of two, 10-foot by 18-foot prefabricated fiberglass basin buildings and a new above-ground 35-foot diameter by 18-foot tall steel water storage tank constructed on a concrete ring foundation. Foundation loads for the buildings are anticipated to be light, and the foundation loads for the proposed water tank are anticipated to be moderate, typical of the proposed construction types. Site grading is anticipated to be negligible with cut and fill depths of less than about 2 to 3 feet. If the proposed construction varies significantly from that described above or depicted in this report, we should be notified to reevaluate the recommendations contained herein.

#### SITE CONDITIONS

The proposed building areas are located within the Arabian Acres subdivision, as shown on Fig. 1, and were generally surrounded by residential construction and neighborhood roadways. An existing tank water storage tank was located adjacent to the proposed tank location and will be demolished prior to construction. Regional topography includes mountainous terrain and rolling hills. The areas of proposed construction were generally level, and were sparsely vegetated with natural grasses and deciduous and evergreen trees. Exposed granite bedrock outcroppings were observed in the areas of Borings 2 through 4. A small pond was located approximately 75 feet south of Boring 2.

#### FIELD EXPLORATION

The field exploration of subsurface conditions consisted of drilling four borings at the approximate locations shown on Figs. 1 through 1C. The borings were drilled on April 17, 2018. The boring log and the corresponding legend and notes are included on Figs. 2 and 3.

The boring was drilled with 4-inch diameter continuous flight augers and was logged by a representative of Kumar & Associates, Inc. Samples of the overburden soils and bedrock were taken with a 2-inch I.D. California sampler. The sampler was driven into the various strata with blows from a 140-pound hammer falling 30 inches. Penetration resistance values, when properly evaluated, provide an indication of the relative density or consistency of the soils. Depths at which the samples were taken and the penetration resistance values are shown on the boring logs, Fig. 2.

The water levels in the borings were checked at the time of drilling. The borings were then backfilled with the on-site soils.

#### LABORATORY TESTING

Samples obtained from the exploratory borings were visually classified in the laboratory by the project engineer and samples were selected for laboratory testing. Laboratory testing included index property tests such as in-situ moisture content and dry unit weight, grain size analysis, and Atterberg limits. Additional testing performed included concentration of water soluble sulfates. The testing was conducted in general accordance with recognized test procedures, primarily those of the American Society for Testing of Materials (ASTM). Results of the laboratory testing program are shown on Figs. 2 and 4 through 6, and are summarized on Table I.

#### SUBSURFACE CONDITIONS

The borings generally encountered granular overburden soils consisting of well graded sand with clay and gravel to clayey sand with gravel extending to approximately 2 to 9.5 feet below the existing grade. The overburden soils in Borings 2 through 4 were generally decomposed granite materials. Based on the sampler penetration blow counts recorded the overburden soils were very loose to dense.

The overburden soils were underlain by sandstone bedrock in Boring 1, and weathered granite in Borings 2 through 4. The bedrock extended to the maximum depths explored of 18 to 20 feet below grade. Practical Auger Refusal was encountered in Boring 4 at 18 feet. Based on sampler penetration resistance blow counts, the sandstone and weathered granite bedrock were generally medium hard to very hard.

Groundwater was encountered in Borings 1 and 2 at depths of 7.4 and 4.9 feet at the time of drilling. Groundwater was not encountered in the remaining borings. We anticipate that the depth to groundwater will fluctuate over time.

### FOUNDATION RECOMMENDATIONS

Considering the subsurface conditions encountered in the exploratory borings and the nature of the proposed construction, a shallow foundation bearing on a minimum of 1 foot of properly compacted structural fill should perform adequately for the proposed prefabricated basin buildings. Ring foundations bearing on the undisturbed bedrock should perform adequately for the desired application.

The design and construction criteria presented below should be observed for a spread footing foundation system. The construction details should be considered when preparing project documents.

- 1. Footings placed on a minimum of 1 foot of scarified and compacted native soils should be designed for an allowable soil bearing pressure of 2,000 psf. Foundations placed on the undisturbed bedrock should be designed for an allowable soil bearing pressure of 5,000 psf.
- 2. Based on experience, we estimate total settlement for footings designed and constructed as discussed in this section will be 1 inch or less.
- 3. Due to the fractured nature of the weathered granite bedrock a smooth surface for foundations and the tank bottom may be difficult to achieve. To provide a uniform bearing surface a properly compacted 6-inch thick layer of Class 1 material can be used. The overburden soils and processed bedrock will likely meet the requirements for Class 1 materials. The bedrock should be processed to a minus 2-inch material. Based on the highly fractured nature of the bedrock processing should be possible with minimal effort.
- 4. Spread footings should have a minimum footing width of 16 inches for continuous footings, and 20 inches for isolated pads.

- 5. Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. Placement of foundations at least 30 inches below the exterior grade is typically used in this area.
- 6. The lateral resistance of a spread footings, or ring foundations will be a combination of the sliding resistance of the foundation on the bearing materials and passive earth pressure against the side of the foundation. Resistance to sliding at the bottom of the foundation may be calculated based on an allowable coefficient of friction of 0.35. Passive pressure against the sides of the foundations may be calculated using an allowable equivalent fluid unit weight of 180 pcf. Compacted fill placed against the sides of the footings to resist lateral loads should be a minus 2-inch granular material compacted to at least 95% of the maximum modified proctor density (ASTM D1557) at a moisture content within 2 percent of optimum. Additional lateral resistance may also be achieved by socketing the footing into an excavation in the undisturbed bedrock.
- 7. Continuous foundation walls should be reinforced top and bottom to span an unsupported length of at least 10 feet.
- Structural fill placed inside of the ring foundation should consist of moisture-conditioned on-site fill or CDOT Class 1 structural fill. The structural fill should be compacted to at least 95% of the maximum Modified Proctor density (ASTM D1557) at a moisture content within 2 percentage points of optimum.
- 9. Areas of loose material or any deleterious materials encountered within the foundation excavation should be removed and replaced with granular structural fill compacted to 95% of the maximum Modified Proctor density (ASTM D1557) within 2 percentage points of optimum. Structural fill should extend down from the edges of the footings at a 1 horizontal to 1 vertical projection.
- 10. Based on the measured water table depths, the proposed foundation elevations appear to be within about 2 to 5 feet of the groundwater level at Borings 1 and 2. Groundwater levels can fluctuate and could rise above the measured levels. Therefore, it may be necessary to dewater some footing excavations during construction. Dewatering should be conducted by using sumps, drains, and/or other dewatering methods to maintain water levels at least 1 to 2 feet below the subgrade elevation to mitigate against loss of soil support.

11. A representative of the project geotechnical engineer should observe all footing excavations prior to concrete placement.

#### PIPE BACKFILL

The use and requirements for bedding material should be in accordance with the pipe manufacturer's recommendations, local building authority, or utility district requirements. In the absence of such guidance, we recommend the pipe bottom consist of imported granular bedding material intended for bedding and pipe embedment zone fill. Bedding and embedment zone material may consist of a rounded granular gravel or sand with a maximum size of <sup>3</sup>/<sub>4</sub> inch, less than 25% passing the No. 50 sieve, and less than 5% passing the No. 200 sieve. The bedding layer should be of adequate thickness to fully support the pipes when seated on top of the bedding. Bedding placed within 6 inches beneath the pipe invert should not be compacted to allow the pipe to seat in the bedding material during installation. Prior to placing the bedding, the subgrade should be excavated, and any loose material should be removed to provide firm subgrade support. If loose soil conditions exist in the trench bottom, it may be necessary to sub-excavate to a greater depth and replace such soils with a deeper bedding section to provide proper pipe support. Bedding material placed below the 6-inch depth for additional support, if required should be compacted using a vibratory plate or other approved densification methods.

The pipe-zone material placed above the bedding and surrounding the pipe should consist of granular material similar to that described above for pipe bedding, and should be compacted to at least 75% relative density (ASTM D 4253 and ASTM D 4254), and in accordance with requirements of the pipe manufacturer, to provide the required support around the pipe and to help mitigate potential bedding settlement zones. The pipe-zone material should also be placed and compacted in accordance with the requirements of the pipe manufacturer. Portions of the pipeline bedding not below current or proposed roadways should be compacted to at least 70% relative density. Special care should be taken to provide adequate compaction below the haunches of the pipe using a concrete vibrator, vibratory plates or other light compaction equipment as needed. In confined areas of the pipeline where compaction is difficult, placement of a cementitious flow fill around the pipe should be considered.

Backfill placed above the pipe-zone materials to the surface may consist of suitable on-site soil obtained from the pipeline excavation. Suitable soils should have a maximum particle size of 3 inches and should be free of organics, wood, or other deleterious material that could decay over time. Most of the soils encountered in the exploratory borings satisfy the material requirements based on laboratory testing of selected samples. Bedrock used in pipe backfill should be

processed to include particles no larger than 3 inches and should have even moisture distribution throughout the material, which may be difficult to achieve in trench conditions. The use of bedrock material that does not break down into a soil-like material may be considered as trench backfill above the embedment material in areas where some amount of settlement can be tolerated. The amount of settlement will be related to the depth of the pipe/thickness of the backfill which may be as much as 2 percent of the backfill thickness. The backfill should be compacted to at least 90% of the modified Proctor (ASTM D 1557) maximum dry density at a moisture content within 2 percent of optimum for granular soils. Materials with excessive moisture, for example those excavated near or below the ground water level, may not be suitable for reuse unless they are allowed to dry prior to placement.

#### SEISMIC DESIGN CRITERIA

The generalized subsurface profile was assumed to consist of relatively shallow sedimentary and granitic bedrock. The weighted average of the estimated shear wave velocities for this subsurface profile to a depth of 100 feet indicates an IBC design Site Class C. Based on the subsurface profile and site seismicity, liquefaction is not a design consideration.

#### WATER SOLUBLE SULFATES

The concentrations of water soluble sulfates measured in samples obtained from the exploratory borings ranged from less than 0.01% to 0.05%. These concentrations of water soluble sulfates represent a Class 0 severity of exposure to sulfate attack on concrete exposed to these materials. The degree of attack is based on a range of Class 0 to Class 3 severity of exposure as presented in ACI 201. Based on this information and our experience with the soil types encountered, we believe special sulfate resistant cement will not be required for concrete exposed to the on-site soils.

#### SURFACE DRAINAGE

Proper surface drainage is very important for acceptable performance of the structures during construction and after the construction has been completed. Drainage recommendations provided by local, state and national entities should be followed based on the intended use of the structures. The following recommendations should be used as guidelines and changes should be made only after consultation with the geotechnical engineer.

1. Excessive wetting or drying of the foundation subgrades should be avoided during construction.

- Any backfill away from the proposed construction should be adjusted to a moisture content ±2% of optimum and compacted to at least 90% of the maximum Modified Proctor density (ASTM D1557).
- 3. Care should be taken when compacting around the foundation walls to avoid damage to the structure.
- 4. The ground surface surrounding the exterior of the building should be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 6 inches in the first 10 feet in unpaved areas. Site drainage beyond the 10-foot zone should be designed to promote runoff and reduce infiltration.
- 5. Ponding of water should not be allowed in backfill material or in a zone within 10 feet of the foundation walls whichever is greater.
- 6. Roof downspouts and drains should discharge well beyond the limits of all backfill.

### EXCAVATION CONSIDERATIONS

In our opinion, the overburden soils should be excavatable with conventional excavation equipment. Excavations in the weathered bedrock will likely require heavy excavation equipment. Rippers may be required if localized harder zones are encountered.

All excavations should be in accordance with OSHA, state and local requirements. In accordance with OSHA guidelines, the native granular soils classify as a Type C material. The bedrock will likely classify as a Type B material due to its surficial weathered nature. Temporary unretained excavations in Type B and C materials should have slopes no steeper than 1:1 and 1.5:1 (H:V), respectively. A properly braced excavation or the use of a trench box should be used where the indicated unretained slopes cannot be accommodated. The contractor should take appropriate precautions during construction. Flatter slopes will be required where groundwater is encountered. Surface draining should be diverted away from all temporary cut slopes in order to reduce the potential for slope erosion and instability. OSHA regulations require that excavations greater than 20 feet in depth be designed by a professional engineer.

If groundwater is encountered in excavations, we believe the dewatering can be accomplished by pumping from sumps installed within the excavation. The pits should be constructed well below the base of the excavation to avoid loss of supporting capacity of the soils. The dewatering system should be properly designed, installed and maintained. The bottom and sides of the excavation may become unstable if the groundwater level is not maintained at a sufficient depth below the bottom of the excavation.

OSHA regulations require that excavations greater than 20 feet in depth be designed by a professional engineer. If soils different from those indicated in this report are encountered, the OSHA soil type may vary and the required cut slopes may need to be adjusted. The contractor's on-site "competent person" should confirm that all necessary slope and shoring design are performed.

#### DESIGN AND SUPPORT SERVICES

Kumar & Associates, Inc. should be retained to review the project plans and specifications for conformance with the recommendations provided in our report. We are also available to assist the design team in preparing specifications for geotechnical aspects of the project, and performing additional studies if necessary to accommodate possible changes in the proposed construction.

We recommend that Kumar & Associates, Inc. be retained to provide observation and testing services to document that the intent of this report and the requirements of the plans and specifications are being followed during construction, and to identify possible variations in subsurface conditions from those encountered in this study so that we can re-evaluate our recommendations, if needed.

#### LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering practices in this area for exclusive use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon data obtained from the exploratory borings at the approximate locations indicated on Figs. 1 through 1C, and the proposed construction. This report may not reflect subsurface variations that occur, and the nature and extent of variations across the site may not become evident until site grading and excavations are performed. If during construction, fill, soil, rock or water conditions appear to be different from those described herein, Kumar & Associates, Inc. should be advised at once so that a reevaluation of the recommendations presented in this report can be made. Kumar & Associates, Inc. is not responsible for liability associated with interpretation of subsurface data by others.

The scope of services for this project does not include any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

JDC:bj

cc: Mike Groselle, P.E., Aqua Works DBO



May 10, 2019 — 09:26am C:\Users\mromero\appdata\local\temp\AcPublish



May 10, 2019 – 09:26am C:\Users\mromero\appdata\loca(\femp\AcPublish\_9636\192!







May 10, 2019 – 09:26am V:\Projecis\2019\19-2-139 Arabian Acres Metropolitan District Distribution System Improvement Project\Drafting\192139-02 to 

 LEGEND

 TOPSOIL.

 Image: Clayey Sand With GRAVEL (SC), MEDIUM PLASTICITY, FINE TO COURSE GRAINED WITH GRAVEL, VERY LOOSE, MOIST, GRAY.

 Image: Clayey Sand With GRAVEL (SC), MEDIUM PLASTICITY, FINE TO COURSE GRAINED WITH GRAVEL, VERY LOOSE, MOIST, GRAY.

 Image: Clayey Sand With GRAVEL (SC), MEDIUM PLASTICITY, FINE TO COURSE GRAINED WITH GRAVEL, MEDIUM TO VERY DENSE, MOIST TO WET, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTICITY, FINE TO COURSE GRAINED WITH GRAVEL, MEDIUM HARD TO VERY HARD, MOIST, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTICITY, FINE TO COURSE GRAINED WITH GRAVEL, MEDIUM HARD TO VERY HARD, MOIST, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTICITY, FINE TO COURSE GRAINED WITH GRAVEL, MEDIUM HARD TO VERY HARD, MOIST, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTICITY, FINE TO VERY HARD, SLIGHTLY MOIST, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTICITY, FINE TO VERY HARD, SLIGHTLY MOIST, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTICITY, FINE TO VERY HARD, SLIGHTLY MOIST, REDDISH BROWN.

 Image: Clayey Sandstone, Low PLASTIC, HARD TO VERY HARD, SLIGHTLY MOIST, REDDISH BROWN.

 Image: Clayey Sample, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

 4/12
 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 4 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

 Image: Clayey Sample Blow Count Report The TIME OF DRILLING.

PRACTICAL AUGER REFUSAL.

#### NOTES

- 1. THE EXPLORATORY BORINGS WERE DRILLED ON APRIL 17, 2019 WITH A 4-INCH-DIAMETER CONTINUOUS-FLIGHT POWER AUGER.
- 2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
- 3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE NOT MEASURED AND THE LOGS OF THE EXPLORATORY BORINGS ARE PLOTTED TO DEPTH.
- 4. THE EXPLORATORY BORING LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
- 5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
- 6. GROUNDWATER LEVELS SHOWN ON THE LOGS WERE MEASURED AT THE TIME AND UNDER CONDITIONS INDICATED. FLUCTUATIONS IN THE WATER LEVEL MAY OCCUR WITH TIME.

```
7. LABORATORY TEST RESULTS:
WC = WATER CONTENT (%) (ASTM D2216);
DD = DRY DENSITY (pcf) (ASTM D2216);
+4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D6913);
-200= PERCENTAGE PASSING NO. 200 SIEVE (ASTM D1140);
LL = LIQUID LIMIT (ASTM D4318);
PI = PLASTICITY INDEX (ASTM D4318);
WSS = WATER SOLUBLE SULFATES (%) (CP-L 2103);
A-2-7 (1) = AASHTO CLASSIFICATION (GROUP INDEX) (AASHTO M 145).
```

lay 10,



2019 — 09:26am ots/2019/19—2—139 Arabian Acres Metropolitan Di

May 10,



10, 2019 — 09:26am raiaris, 2010, 19–2–130 Arnhim Arnas Mainonnillium District Distribution Svetam Immonovement Profend D

May



2019 — 09:28am cis\2019\19-2-139 Arabian Acres Metropolitan District Distribution System Improvement Proje

May 10,

## Kumar and Associates, Inc.

# TABLE ISUMMARY OF LABORATORY TEST RESULTS

Project No.: 19-2-139 Project Name : Arabian Acres Metro District Date Sampled: 4/17/2019 Date Received: 4/18/2019

SAMPLE LO	OCATION		NATURAL	NATURAL	GRADA	TION	PERCENT	ATTERB	ATTERBERG LIMITS		ATTERBERG LIMITS		AASHTO	
BORING	DEPTH (ft)	DATE TESTED	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	GRAVEL (%)	SAND (%)	PASSING NO. 200 SIEVE	Liquid Limit	PLASTICITY INDEX	SOLUBLE SULFATES (%)	CLASSIFICATION (Group Index)	SOIL OR BEDROCK TYPE (Unified Soil Classification)		
1	2	4/22/19	14.0	114.9	20	61	19	44	28	<0.01	A-2-7 (1)	Clayey Sand with Gravel (SC)		
1	4	4/22/19	6.0	135.8	11	77	12	31	12		A-2-6 (0)	Sandstone		
2	2	4/22/19	6.4	116.0	32	60	8	39	12	0.05	A-2-6 (0)	Well Graded Sand with Clay and Gravel (SW-SC)		
2	4	4/22/19	5.7	129.9								Well Graded Sand with Clay and Gravel (SW-SC)		
3	4	4/22/19	3.6	127.0	15	73	12		NP		A-1-b (0)	Granite		
4	4	4/22/19	5.4	125.2	28	61	11		NP		A-1-a (0)	Granite		

# Jehn Water Consultants, Inc. Water Resources Consulting

88 Inverness Cir East Suite K-102

Celebrating Over 25 Years of Excellence

Englewood, Co 80112 (303) 321-8335

# **MEMORANDUM**

TO:	Adam Sommers
FROM:	Hillary Banks & Gina Burke
DATE:	December 18, 2019
SUBJECT:	Arabian Acres Water Supply Study
JOB NO:	982.1

This Memorandum summarizes our work to evaluate the hydrogeologic conditions at the existing Arabian Acres wells, to provide recommendations for additional well locations, and to estimate sustainable pumping rates for each of the District's existing wells.

#### Alternative Water Sources

In order to recommend locations for additional water sources, we compiled geologic information and aerial photography for the property and surrounding area to identify potential fracture zones to be further evaluated in the field. Fractures in the Pikes Peak Granite underlying Arabian Acres tend to increase the potential for a productive well as the fracturing increases the bedrocks' capability to store and transmit water.

During a field visit conducted with AquaWorks, DBO on August 7<sup>th</sup>, 2019, we identified a site near the existing Well #3 to re-drill to a greater depth, and we identified a site near the existing Well #1 to drill a new well (Well #10) as an additional water source. That location was assessed for its proximity to the identified fracture zones, cost effectiveness as related to the proximity of existing infrastructure, equipment accessibility, and availability of land for an easement. In the cases of both the Well #3 re-drill and the potential new well, nearby homeowners' well locations must be identified to maintain the Division of Water Resources 600-foot spacing limitation, or the District must obtain consent from the existing well owners.

During that site visit with AquaWorks, DBO we assessed the existing wells' yields and the overall District water supply system. We understand that the existing system is using each well's submersible pump to transport water to ground surface, through the system piping to the control buildings, and then upgradient to the water storage tank. This system taxes

Arabian Acres Metropolitan District December 18, 2019 Page 2

the submersible pump's ability to provide pressure and could produce a flow rate into the system that is less than the well's actual production rate. With the addition of booster pumps to the system, it may be possible to increase the existing system's production to meet current and future demands. To determine accurate production rates at each well, and estimate hydrogeologic properties, we proposed conducting short duration pumping tests at each of the existing wells within the District.

### **Pump Testing**

On November 6<sup>th</sup> and 7<sup>th</sup>, 2019, short duration pumping tests were conducted on each of the Arabian Acres wells. The wells were pumped to waste at the wellheads in order to determine the actual pumping flow rate. During the tests the water level was recorded using a portable water level meter (MScope), and flow measurements were recorded using each well's newly installed totalizing flow meter. Each well was pumped at a continuous rate for two hours, or until the water level had dropped to the shut-off point. After the pumps were shut-off, water level recovery data was recorded.

#### Pump Testing Results and Hydrogeologic Parameters

The recorded drawdown, recovery and pumping data were input into spreadsheets for analysis. Theis and Cooper-Jacob methodologies were utilized to analyze drawdown and recovery data for interpretation of hydrogeologic parameters. Table 1 summarizes the static water level, the average pumping rate, the maximum observed pumping water level, and the estimated transmissivity. In the case of Wells #2 and #9, the average pumping rates were not high enough to produce observable drawdown in the wells, therefore hydrogeologic parameters could not be estimated.

#### **Estimated Well Production**

Using the hydrogeologic parameters estimated from the pump tests, we modeled the maximum pumping rate that each well could sustain for 24-hours of continuous pumping without reaching the well shut-off point. The results from these analyses are presented in Table 1. In the wells that reached the shut-off point during the pumping test, a lower pumping rate was modeled that would allow the well to run continuously. We do not recommend replacing the pumps in the wells at this time, however a pumping strategy that pumps the wells until shut-off, and then allows them to rest for several hours should be used.

Additionally, we modeled the maximum time that each well can pump at the observed average pumping rate before the well shut-off point is reached. In the case of Wells #1, #4, and #8 the wells reached the shut-off point during the two hour test, at the times noted in Table 1. Wells #2 and #9 did not result in observable drawdown, indicating that a higher pumping rate could be achieved with a higher capacity pump. Based on our modeling, Wells #2, #5, #6, #7, and #9 have the ability to pump continuously over a thirty day period without reaching the shut-off point, for a combined average pumping rate of 39 gpm. With the addition of Wells #1, #4, and #8 pumping with rest periods, we believe that the District can achieve an average pumping rate of 40 gpm. Completing the Well #3 re-drill and the potential new Well #10 will add additional production to the system for future demand and for margin of safety should any of the wells need maintenance or repair. Based on the

Arabian Acres Metropolitan District December 18, 2019 Page 3

production at the original Well #3, an additional 5 gpm could be added to the total system production.

These results do not take into account any regional water level decline over time, or seasonal variability, and assume that the efficiency of the wells does not deteriorate significantly over time.

#### Recommendations

We recommend that the District replace Well #3 by having it re-drilled. We recommend that the new well be completed to a greater depth than the original Well #3 (20 feet below ground surface), and be completed with a larger screened interval to achieve the highest possible production rate. We recommend that following drilling and the completion of the well, the drilling contractor perform a pump test to determine the appropriate pump size to achieve a sustainable pumping rate. If an alternative water source is desired, drilling an additional Well #10 near existing Well #1 is the most economically and logistically viable location, and could provide additional production to the system. We recommend that Well #10 be drilled to a greater depth than Well #1 (120 feet below ground surface), and be completed with a larger screened interval to achieve the highest possible production rate. We also recommend that the drilling contractor perform a pump test to determine the appropriate pump size and pumping rate based on the well production. Finally, it may be possible to increase the existing system's production to meet current and future demands using the existing wells.

If there are any questions, please do not hesitate to call.

TABLE 1							
Arabian Acres Wells Pump Testing Results							

			Pum	p Testing Results					
	Well Depth	Static Water Level ft bos	Average Pumping Rate	Maximum Pumping Water Level	Length of Test	Modeled time pumping until pump shut-off at Average Pumping Rate time	Estimated Transmissivity	Modeled Sustainable 24-hour pumping rate	Notes
Well 1	120	12	13.2	105	73	73 minutes	100	5 to 8	Well ran dry during test
Well 2	300	6	13.5	8	120	undefined	undefined	>13.5 <sup>2</sup>	Not enough observable drawdown to determine hydrogeologic parameters
Well 4	200	7	8.5	189	73	73 minutes	20	3 to 4	Well ran dry during test
Well 5	570	75	3.1	>238	107	>30 days	8	4 to 5	Pumping water level unknown, water level instrument stuck during test
Well 6	300	88	10.1	151	120	>30 days	104	15 to 20	
Well 7	400	66	7.9	189	120	>30 days	43	10 to 13	
Well 8	380	19	9.2	300	70	70 minutes	16	5 to 6	Well ran dry during test. Wells 8 and 2 were pumped concurrently during the test, and well to well interference may have reduced yield.
Well 9	600	12	4.3	12	80	undefined	undefined	>4.3 <sup>2</sup>	Not enough observable drawdown to determine hydrogeologic parameters
Total: 69.7 gpm								Total: 59.8 gpm	

Notes:

1. Static water level and pumping water level are in feet below ground surface (ft bgs).

2. Pumping at Wells 2 and 9 did not result in observable drawdown, indicating that a higher pumping rate could be achieved with a higher capacity pump.



VICINITY MAP NOT TO SCALE





	SHEET LIST TABLE			
SHEET NUMBER	SHEET TITLE			
GENERAL	-			
G1	COVER			
G2	ABBREVIATIONS & SYMBOLS			
G3	NOTES & REQUIREMENTS			
G4	PROCESS FLOW DIAGRAM			
G5	HYDRAULIC PROFILE			
G6 WELL INSTALLATION DETAILS				
WATER STORAGE T	ANK			
WST1				
WST2	WATER STORAGE TANK PLAN & SECTION			
WST3	WATER STORAGE TANK DETAILS			
CONTROL BUILDING	S			
CB1	CONTROL BUILDING A SITE PLAN			
CB2	CONTROL BUILDING A PLAN			
CB3	CONTROL BUILDING A SECTIONS			
CB4	CONTROL BUILDING B SITE PLAN			
CB5	CONTROL BUILDING B PLAN			

SHEET LIST TABLE							
SHEET NUMBER	SHEET TITLE						
CB6	CONTROL BUILDING B SECTIONS						
CB7	CIVIL DETAILS						
CB8	CIVIL DETAILS 2						
CB9	EROSION CONTROL DETAILS						
SCADA							
SC1	SCADA PLAN						
STRUCTURAL							
S1	STRUCTURAL NOTES & SPECIFICATIONS						
S2	FOUNDATION PLAN						
S3	FOUNDATION DETAILS						
ELECTRICAL							
E1							
E2	ELECTRCIAL ONE LINE & TABLES						
E3	CONTROL BUILDING A ELECTRICAL						
E4	CONTROL BUILDING B ELECTRICAL						
E5	ELECTRCIAL WELL POWER						







## PROJECT TEAM:

OWNER: ARABIAN ACRES METROPOLITAN DISTRICT ATTN: WALKER SCHOOLER DISTRICT MANAGERS 614 N. TEJON ST COLORADO SPRINGS, CO 80903

# PROJECT MANAGER/CIVIL PROCESS ENGINEER: AQUAWORKS DBO, INC. MR. ADAM SOMMERS, P.E.

3252 WILLIAMS STREET DENVER, CO 80205 (303) 477-5915

ELECTRICAL ENGINEER: STRAIGHTEDGE, INC. MR. BILL BRUNNER, P.E. 14526 W. 57TH PLACE ARVADA, CO 80002 (303) 403–0531

# STRUCTURAL ENGINEER: WALLACE ENGINEERING, INC.

MR. PRYCE JOYNER, P.E. 9800 PYRAMID CT, SUITE 350 ENGLEWOOD, CO 80112 (303) 350-1690

SYSTEM OPERATOR: MR. LYNN WILLOW 5305 WHIMSICAL DRIVE COLORADO SPRINGS, CO 80917 (719) 482–1525

ARABIAN ACRES METROPOLITAN DISTRICT UNINCORPORATED TELLER COUNTY, COLORADO



	1	2		3		4		5		6		7			8		9	10
AB ABC	ANCHOR BOLT AGGREGATE BASE COUF	RSE	F/F	FACE TO FACE	MG MGD	MILLION GALLONS OR MILLIGR MILLION GALLONS PER DAY	AMS	SA SALV	SUPPLY AIR SALVAGE	WT WT	R WATER RPRF WATERPROOF(ING)							
AC	AIR CONDITIONING		FCA FD	FLANGE COUPLING ADAPTER FLOOR DRAIN	MGMT	MANAGEMENT MANHOLE		SAN	SANITARY SPLASH BLOCK	X-	SECT CROSS SECTION					SYMBOL LEGEND		
ACP	ASPHALTIC CONCRETE		FDN FED	FOUNDATION FEDERAL	MIN			SCFM	STANDARD CUBIC FEET PER MIN	UTE YC	0 YARD CLEANOUT					STINDOL LEOLIND		
AD	AREA DRAIN OR ACCES	SS DOOR	FES FFE	FLARED END SECTION FINISH FLOOR ELEVATION	MJ	MECHANICAL JOINTS		SCRN	SCREEN	YH	YARD HYDRANT		E K	ARTH	•	THRUST BLOCK	—GAS—	EXISTING GAS LINE
ADDM	ADJUSTABLE		FIN FI	FINISH FLANGE	MRGYB	MOISTURE RESISTANT GYPSU	M WALL BOARD	SDR	STORM DRAIN STANDARD DIMENSION RATIO			222	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		¢ <b>‡≣</b> \$	HARNESSED MECHANICAL C	OUPLING	EXISTING WATER LINE
AFF	ABOVE FINISHED FLOOR ABOVE FINISHED GRADE	R E	FLL	FLOW LINE	MTG	MOUNTING		SECT	SECTION SHOULDER				R R	ROCK	<b>₽</b>	NEW VALVE W/ TIE RODS	UT	
AHU	AIR HANDLING UNIT ALUMINUM		FN	FENCE	N NA	NITROGEN NOT APPLICABLE		SHT SHTHG	SHEETING SHEATHING	Ś		Г	G	ROUT	≡ X⊡ 3	EXISTING VALVE	01	
ALT			FOC	FACE OF CONCRETE FEET PER MINUTE	NAOCL	SODIUM HYPOCHLORITE		SIM	SIMILAR SI FEVE	a a	P.000000000000000000000000000000000000		 2701	RAVEI				PROPOSED STORM DRAIN
APPROX			FPS FPW	FEET PER SECOND FIRE PROTECTION WATER SUPPLY	NIC	NOT IN CONTRACT		SM	SMOOTH	BATS	sour the t	<b>b</b> <u>108</u>	<u> </u>		$-\forall$	PRESSURE RELIEF VALVE		
ASME	AMERICAN SOCIETY OF	MECHANICAL ENGINEERS	FR FRP	FRAME FIBERGLASS REINFORCED PLASTIC	NPL	NAME PLATE		SPEC	SPECIFICATION	850	in philad		s s	STEEL	M		UGE	UNDERGROUND ELECTRIC
ASIM	AMERICAN SOCIETY FOR ASPHALT	R TESTING AND MATERIALS	FSTNR	FASTENER	NPT NPW	NATIONAL PIPE THREAD NON-POTABLE WATER		SQ SQ FT	SQUARE FEET	8 T I	38169 h: m	B .	<u>م</u> ر	ONCRETE	Ц	BOTTERFET VALVE	-Ø 0HF	OVERHEAD ELECTRIC W/
ASSY ATS	ASSEMBLY AUTOMATIC TRANSFER	SWITCH	FTG	FOOTING OR FITTING	NRS NS	NON-RISING STEM NEAR SIDE		SQ IN SQ YD	SQUARE INCH SQUARE YARD	88:	1/15/20				A	CHECK VALVE		POWER POLE
AVG AVS	AVERAGE AUTOMATIC VALVE STAT	ATION	FUR	FURNACE	NTS	NOT TO SCALE		SS SST	SANITARY SEWER STAINIESS STEEL	N 74. 1		<b>j</b> 🗠	<u></u>	DAND			¤	ELECTRICAL LIGHT POLE
			G GA	GAS GAUGE	00	ON CENTER		SST BT	STAINLESS STEEL BOLT	W.B	°°°°°°°°°		∠ C	CONCRETE MASONRY UNIT	<del>, (</del>	HARNESS		
B&F	BELL & FLANGE		GAL GAL V	GALLON GAL VANIZED	OF	OVER FLOW		STA	STATION	4000	UNAL O	FTT	R	RIGID INSULATION	_ <u>%</u>	STOP & WASTE VALVE	∞——	EXISTING SANITARY SEWER
BAF	BOND BEAM BAFFLE		GIP	GALVANIZED IRON PIPE	OPNG	OPPOSITE		STL	STANDARD	4	00000				- <b>o</b> -	BALL VALVE	••	PROPOSED SANITARY SEWER
BC BE	BACK OF CURB BELL END		GPD	GALLONS PER DAY	OPT	OPTIONAL		STL JST STL PL	steel joist Steel plate			$\bowtie$	<u>**</u>	BATT INSULATION				PROPERTY LINE
BF BFV	BOTTOM FACE BUTTERFLY VALVE		GR BM	GRADE BEAM	P PA	PUMP PIPE ANCHOR		SUPP SUSP CLG	Supply Suspended Ceiling			//,	//, G	GLASS				
BLDG	BUILDING		GRC GRTG	GALVANIZED RIGID CONDULT GRATING	PAR	PARALLEL PORTLAND CEMENT		SV	SOLENOID VALVE			 				GATE VALVE	Δ	SURVEY CONTROL POINT
BM	BENCHMARK		GSP GV	GALVANIZED STEEL PIPE GATE VALVE	PCO	PRESSURE CLEAN OUT		SW	SIDEWALK						ᆂᆍ	MECHANICAL JOINT		
BOD	BIOCHEMICAL OXYGEN D	DEMAND	GWB	GYPSUM WALL BOARD	PD	PUMP DISCHARGE LINE		SYMM	SYMMETRICAL			$\boxtimes$	S s	SCREEN	<del>~ <b> </b> 0</del>			LIMITS OF GRAVEL SURFACING
BOI	BOOSTER PUMP	H IANK	H	HIGH HOSE RIP	PE	PLAIN END PERMANENT		SYS	SYSTEM			E	G	RATING IN PLAN			11	
BS BSMT	BACKSIGHT BASEMENT		HDWL	HEAD WALL	PERP PG	PERPENDICULAR PRESSURE GAGE		T T&B	tee Top and bottom							NEW PIPE IN SECTION		ASPHALT PAVING
BU BV	BELL UP BALL VALVE		HNDRL	HAND KAIL HANDWHEEL	PL PLBG	PLATE OR PROPERTY LINE PLUMBING		T&G T&P	TONGUE AND GROOVE TEMPERATURE AND PRESSURE					GRATING IN SECTION				
BCV	BUTTERFLY CHECK VAL	LVE	Horiz HP	HORIZONTAL HORSEPOWER	PLYWD	PLYWOOD PAINT		TB	TOP OF BEAM			۵	$\leq$	WOOD IN SECTION	$\langle \rangle$	Existing PIPE in Section		CONCILLE I ANING
			hpt Hr	HYDROPNEUMATIC PRESSURE TANK HOUR	POLY	POLYETHYLENE		TE				Г		FXISTING STRUCTURE	$\tau \tau$		$\overline{}$	
CB	CATCH BASIN		HS HVAC	HIGH STRENGTH HEATING VENTILATION AIR CONDITIONING	PORT	POSITIVE		TF	TOP OF FOOTING			J.				WALL SLEEVE	SAL	PROPOSED CONTOUR
CCW CDOT	COUNTER CLOCKWISE COLORADO DEPARTMEN	IT OF TRANSPORTATION	HW	HOT WATER	PPM PRCST	PARTS PER MILLION PRECAST		TFB	TO FLOOR ABOVE			ե	–J '	NEW STRUCTURE				
CEB CIP	CONCRETE EQUIPMENT	BASE	HWY	HIGHWAY	PREFAB PREFIN	PREFABRICATED PREFINISHED		tff Thd	top of Finish Floor Thread(ed)				··	DRAINAGE FLOW LINE	⊒≞≞₽	PIPE 4" DIA OR GREATER	**	EXISTING CONTOUR
CIMJ	CAST IRON MECHANICAL	AL JOINT	עזא		PRELIM	PRELIMINARY		THK	THICK TOP OF JOIST						1 1		. 古 .	
CJ	CONSTRUCTION JOINT		INCL	INCLUDED INCREASER	PROJ	PROJECT		TOB	TOP OF BANK			-x-	_x_	FENCE	,t,,t	PIPE LESS THAN 4" DIA		SAMPLE POINT
CLG	CEILING		ID IF	INSIDE DIAMETER INSIDE FACE	PRS	PRESSURE REDUCING STATIO		TOE	THREADED ONE END			Г	27 1	BUSHES TREES	<del>-</del> to	LINE TURNING UP	Π	LEVEL INDICATOR
CLR CMP	CLEAR CORRUGATED METAL PI	IPE	INL INSTI	INLET INSTALLATION	PRIV	PRESSURE / TEMPERATURE T PRESSURE REDUCING VALVE	RELIEF VALVE	TOF	TOP OF FOOTING				· [ ]					
CMU CO	CONCRETE MASONRY UI CLEAN OUT	INIT	INSTR		PS PSF	PIPE SUPPORT POUNDS PER SQUARE FOOT		TP TR	TOP OF PAVEMENT TOP OF RIM					BID ALTERNATE	+ə	LINE TURNING DOWN	. — .	
CONSTR	CONSTRUCTION		INTR	INTERIOR	PSI PSIA	POUNDS PER SQUARE INCH POUNDS PER SQUARE INCH	ABSOLUTE	TSL TST	TOP OF SLAB TOP OF STEFI									FLOW METER
COR			INV EL		PSIG	POUNDS PER SQUARE INCH (	GAGE	TW	TOP OF WALL					STMBULS				
	COUPLING		ISA ISO	INSTRUMENT SOCIETY OF AMERICA ISOMETRIC	PVMT			TYP	TYPICAL				-	- Section Letter Ident	FICATION		R	PUMP
CTJ	CONTROL JOINT		JST	JOIST				UBC	UNIFORM BUILDING CODE			4		<ul> <li>Sheet where the sec</li> <li>Indicates same dr</li> </ul>	TION OR ELEVATION	IS DRAWN		
CIR	CAUSTIC SODA		JTS	JOINTS	QAVG QMAX	MAXIMUM DAILY FLOW		UE UG	UNDERGROUND ELECTRIC								Õ	
CW CWL	COLD WATER CONTROL WATER LEVEL	L	K0		QPEAK QCV	PEAK HOUR FLOW QUICK COUPLER VALVE		ULT UN	ULTIMATE UNION			ARROW INDICAT	ES VIEWING	ORIENTATION			T	KADIO
CY	CUBIC YARDS		KWY	KEYWAY	QTR QTY	QUARTER QUANTITY		UNG UNFIN	UNDERGROUND NATURAL GAS UNFINISHED								$\gg$	
DEMO	DEMOLITION		L	LEFT OR LITER	R	RISER		UNIF				SECTION	A	SECTION LETTER			1	ELECTRICAL ANALOG SIGNAL
DIA	DIAMETER		lab Latl	LABORATORY LATERAL	RAD	RADIUS						1/4"=1'-0"		SHEETS WHERE IS CUT OR CAL	The section or ele .ed out	VATION	$\gg$	
DIAG	DIAGONAL DIMENSION		LAV LB(S)	LAVATORY POUND(S)	RCP	REINFORCED CONCRETE PIPE		VAC	VALVE BOX					- INDICATES S/	ME DRAWING		$\sim$	ELECTRICAL DIGITAL SIGNAL
DIP DIS	DUCTILE IRON PIPE DISCHARGE		LCMU	LIGHTWEIGHT CONCRETE MASONRY UNIT	RD RED	ROOF DRAIN REDUCER		VCP VTR	VITRIFIED CLAY PIPE VENT THROUGH ROOF			SECTION OR EL	VATION III	ILE			ARV	AIR RELIFE VALVE
DISP DL	DISPENSER DEAD LOAD				REC RECT	RECESSED RECTANGULAR		w	wide or width					DETAIL NUMBER I	DENTIFICATION		仝	
DMJ DN	DUCTILE MECHANICAL J DOWN	JOINT	LNG	LENGTH	REF REHAB	REFERENCE REHABILITATION		W/ W/O	WITH WITHOUT			UE I AIL		SHEETS WHERE TI	E DETAIL IS CALLED	OUT		
DR			LOC LP	LOCATION LOW PRESSURE OR LIGHT POLE	REINF	REINFORCE		w/w	WALL TO WALL			1/4 =1 =0	Ý	- INDICATES SAM	E DRAWING			TREE
DWL	DOWEL		LRG LT	LARGE LIGHT	RESIL	RESILIENT		WC WCO	WATER CLOSET WALL CLEANOUT			DETAIL TITLE					7/JW **	
DWN	DRAIN WASTE AND VEN	NT	LT WT	LIGHT WEIGHT LIGHT WEIGHT CONCRETE	RFCA	RESTRAINED FLANGED COUPL ROOFING	ING ADAPTER	WD WDW	WOOD WINDOW									
EA	EACH	i	LWL	LOW WATER LEVEL	RH RM	RIGHT HAND ROOM		WF	WIDE FLANGE WALL HYDRANT			(A)						
ECC EF	ECCENTRIC EACH FACE OR ELECTR	RICAL FAN	MAINT	MAINTENANCE	RND RO	Rounded Rough opening		WHSE	WAREHOUSE			4	-	INDICATES SAME DRAWING	DIAMIN		150	
EFF EJ	EFFLUENT EXPANSION JOINT		MAN	MATERIAL	ROW RPBP	RIGHT OF WAY REDUCED PRESSURE BACKED	OW PREVENTER	WL.	WATER LINE OR WIND LOAD			DETAIL MARKER				Contraction of the second		
EL EVICT OD (	ELEVATION		MAX MCC	MAXIMUM MOTOR CONTROL CENTER	RPM	REVOLUTIONS PER MINUTE		WPR	WORKING PRESSURE								JRAL	)() X111
EXIST OR (	EXISTING GRADE		MECH MED	MECHANICAL MEDIUM	RR	RAILROAD		WS WT	WEITED SURFACE WEIGHT							SOUR WHAT'S BE	100. 3313 33500 9	
	EXTERIOR EXTENSION		MFM MFR	MAGNETIC FLOW METER MANUFACTURER	RIN	KE IUKIN											and the second second	
								1							-			
REV. No:	DATE: BY:	REVISION DESCRIPTION:		DRAWN BY: AS							PROJECT:	ARABIAN ACRE		ROPOLITAN DISTRIC		SHEET TITLE:		、
	<u> </u>			DESIGNED BY: AS								UNINCORPORA	LR IREA FD TFI	IFR COUNTY COU		ARRENIA	TIONS & STMBOLS	
<b>—</b>				FILE PRINTED ON: 1/15/2	2020 11:	08:41 AM					ENGINEER:	AQUAWORKS D	BO. INC					сисет.
				COPYRIGHT: AQUAWORKS	DBO, INC.			Δ	าแลWorks	: I)R(		3252 WILLIAMS	STREE	T		PROJECT NUMB	ER: SCALE:	SHEET:
				0 1 IF	THIS BAR	DOES NOT READ 1"			<b>JUL VV UIN</b> DESIGN BUILD OPERAT	שטק	INC	DENVER, COLO	RADO 8	80205		<b>#</b> 1745	ΝΟΤ	TO SCALE G2
					AWING IS I	NOT LABELED TO SCAL	E					(303) 477-59	15			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

_		
•		



					IF.						
DISTRICT ROVEMENTS Y, COLORADO	SHEET TITLE: ABBREVIATIONS & SYMBOLS										
	PROJECT NUMBER:	SCALE:		SHEET:							
	<b>#</b> 1745	ΝΟΤ ΤΟ	SCALE	G2							
8	9	1	0								
1	2	.3		4		5		6	7		
---	--	---	--	----------------------------------	--	---	---------------------------------------	---	---	-------------------------	--
NOTES:	2	5		RE		EMENTS:		Ŭ	, , , , , , , , , , , , , , , , , , ,		
GENERAL:				PU	BLIC HE	ALTH:					
1. PROJECT ADDRE	SS: 72 SILBANI LANE, FLORISSANT,	COLORADO, 80866.		1.	AWWA	B300-04A: STANDARD	FOR HYPO	CHLORITES.			
2. PRIOR TO COMM	ENCEMENT OF ANY CONSTRUCTION,	THE CONTRACTOR SHALL GIVE TH	E OWNER	2.	ALL WE	TTED MATERIALS SHALL	. BE NSF 6	61 RATED.			
3. NO BELOW GRA TO VERIFY THE LO THE APPROPRIATE	DE UTILITIES WERE LOCATED FOR T CATION OF ALL UTILITIES PRIOR UTILITY COMPANY. CONTRACTOR IS	HIS PLAN SET. CONTRACTOR IS RE O CONSTRUCTION AND TO COORD RESPONSIBLE TO PROTECT UTILIT	ESPONSIBLE INATE WITH IES DURING	5. <b>ELE</b> 1. C	CTRICA	<b>L:</b> Tor to coordinate mo	DIFICATION	IS TO EXISTING ELECTRICAL SEI	RVICE WITH UTILITY AND OWNER.		
CONSTRUCTION. IF A CONFLICT EXISTS AND/OR A DESIGN MODIFICATION IS REQUIRED, OWNER AND CONTRACTOR SHALL COORDINATE WITH ENGINEER TO MODIFY THE DESIGN. DESIGN MODIFICATION(S) MUST BE APPROVED BY THE OWNER PRIOR TO BEGINNING CONSTRUCTION AFFECTED. FOR UTILITY					2. REFER TO ELECTRICAL DRAWINGS. PROCESS PIPING: 1. CONTRACTOR TO PROVIDE ALL SUPPORTS AS REQUIRED						
4. ACTUAL LOCA	TIONS, DISTANCES, AND ELEVATION	NS WILL BE GOVERNED BY ACT	TUAL FIELD	2. /	ALL PROC	ESS PIPING SHALL BE	SCH 80 PV	/C UNLESS OTHERWISE NOTED.			
ENGINEER.	ACTOR TO FIELD VERIFY CONDITIO	NS AND REPORT ANY DISCREPANCI	ES IO IHE	<u>PIP</u> 1. II	Ing ide Nclude i	INTIFICATION REQUI	REMENTS	: <u>.</u> All Piping.			
5 CONTRACTOR S EXISTING LANDSCA CONDITION OR BI RESTORING SITE TO	HALL BE REQUIRED TO RESTORE PE, STRUCTURES, OR IMPROVEMEN ETTER PRIOR TO ACCEPTANCE PRE-CONSTRUCTION CONDITION.	THE ROUTE OF WORK AND ANY ITS AS THE RESULT OF WORK TO DF WORK. CONTRACTOR RESPON	´ DAMAGED ⊃ ORIGINAL SIBLE FOR	2. <i>4</i> (NO	ALL PIPIN T ALL M	G SHALL EITHER BE PA AY BE INCLUDED WITH T	INTED OR THIS PROJE	LABELED USING THE FOLLOWING	G COLOR SCHEDULE		
6. NO UTILITY SE OWNER'S REPRESEN	RVICE MAY BE DISCONNECTED WI ITATIVE.	HOUT PRIOR APPROVAL OF THE	OWNER OR	<u>WAT</u> RAW SET FINI	<u>er lines</u> / Or rec Tled or Shed or	<u>S</u> YCLE CLARIFIED POTABLE	OLIVE ( AQUA DARK E	GREEN BLUE			
7. CONTRACTOR TO DURATION OF THE	) PROVIDE AND MAINTAIN TEMPORA PROJECT.	RY PORTABLE RESTROOM FACILITIE	S FOR THE	<u>CHE</u>	MICAL LI	NES IMARY COACULANT	ORANG	F			
8. CONTRACTOR S INCLUDES, BUT IS OSHA, PUBLICATION	HALL EXHIBIT NECESSARY SAFETY NOT LIMITED TO, SIGNAGE, SECI 1 2226, "EXCAVATION AND TRENCH	PRECAUTIONS DURING CONSTRUCT IRITY, AND EXCAVATION AS SET NG OPERATIONS."	ION, WHICH FORTH BY	ALU AMM CAR CAU CHL	IONIA BON SLU STIC ORINE	RRY	WHITE BLACK YELLOW YELLOW	/ WITH GREEN BAND			
9. CONTRACTOR SH THE CONSTRUCTION DEPARTMENT OF P	IALL BE RESPONSIBLE FOR THE PR I OF THE IMPROVEMENTS SHOWN I JBLIC HEALTH AND ENVIRONMENT (	OCUREMENT OF ALL PERMITS NECE NCLUDING BUT NOT LIMITED TO A CONSTRUCTION STORM WATER PERM	SSARY FOR COLORADO IT.	OZO POL POT SOD	NE YMERS C ASSIUM I A ASH	R COAGULANTS PERMANGANATE	YELLOW ORANGE VIOLET LIGHT (	/ WITH ORANGE BAND E WITH GREEN BAND GREEN WITH ORANGE BAND			
10. CONTRACTOR S STRUCTURES, AND	HALL VERIFY INVERT ELEVATIONS C OUTFALLS PRIOR TO CONSTRUCTIO	F EXISTING VALVES, WATERLINES, N.		WAS	TE LINES						
11. THE CONTRAC RECORDING ALL I TREATMENT PLANT UPON COMPLETION	TOR SHALL MAINTAIN ON SITE NFORMATION PERTAINING TO THE IMPROVEMENTS. THESE RECORD D OF THE PROJECT.	A FULL SET OF CONSTRUCTION CONSTRUCTION OF THE DRINKI RAWINGS SHALL BE PROVIDED TO	DRAWINGS, NG WATER THE OWNER	SLU SEW <u>OTH</u>	KWASH DGE ER E <u>R</u> IPRESSEE		DARK E DARK (	GROWN GRAY GREEN			
12. HORIZONTAL A RECOMMENDATIONS	ND VERTICAL DEFLECTION OF THE FOR THE PIPE MATERIAL AND TES	PIPES SHALL NOT EXCEED MANUF T PRESSURE SPECIFIED.	ACTURER'S	GAS			RED				
13. THE HORIZON ZONE 0502 (CENTF	TAL DATUM IS COLORADO STATE RAL). THE VERTICAL DATUM IS NAV	PLANE COORDINATES (NAD 83), D 1988.	COLORADO								
14. CONTRACTOR S DIMENSIONS OR E FEATURES SHALL E WITH THE WORK WI	HALL NOT SCALE FROM DRAWINGS DISCREPANCIES IN PLANS, FIELD BE BROUGHT TO THE ATTENTION O THOUT NOTIFYING ENGINEER HE DO	FOR CONSTRUCTION PURPOSES. A STAKING, FIELD CONDITIONS OR THE ENGINEER. IF CONTRACTOR ES SO AT HIS OWN RISK.	NY MISSING PHYSICAL PROCEEDS								
15. IF CONFLICTS, WRITING WITH A RE	QUESTIONS OR INTERPRETATION QUEST FOR INFORMATION (RFI).	ARE REQUIRED CONTACT THE EN	NGINEER IN								
BUILDING REQU	REMENTS:										
1. CONTRACTOR TO	CONFORM TO CURRENT EDITION IE	C AND TELLER COUNTY BUILDING (	CODES.								
2. INSTALL PORTAE	BLE FIRE EXTINGUISHERS THROUGHC	UT THE BUILDINGS PER IFC AND N	FPA 10.								
REV. No: DATE:	BY: REVISION DESCRIPTION:	DRAWN BY: AS							PROJECT: ARABIAN ACRES METRO	POLITAN DIS	
		DESIGNED BY: AS	15 /2020 41:0	0. 41					POTABLE WATER TREATMUNINCORPORATED TELLE	MENT IMPRO R COUNTY,	
		COPYRIGHT: AQUAWO	RKS DBO, INC.	0:41 AM		∆∩	112\M	Inrks DRA	ENGINEER: AQUAWORKS DBO, INC. 3252 WILLIAMS STREET		
		0	IF THIS BAR DO	DES NOT READ	1" SCALE		DESIGN BUI		DENVER, COLORADO 802 (303) 477-5915	205	

8	9	10

	E	
A THE STATE OF THE	F	

		-			1	
ISTRICT OVEMENTS 7, COLORADO	SHEET TITLE: NOTES & REQUIREMENTS					
	PROJECT NUMBER:	SCALE:		SHEET:		
	<b>#</b> 1745	ΝΟΤ ΤΟ	SCALE	G3		
8	9		1	0		





1	2	3	5	6 7
I	Δ		5	0 /
	Well Summary: Division of Water Reso	urces (aka the State Engineer's office)	Well Sum	mary: Division of Water Resources (aka the State Engineer's office)
	Well Permit and Well Drillers Log Sanitary Well Seal including but not limite	must be attached in Appendix C. d to: Well name	Sanitary \	I Permit and Well Drillers Log must be attached in Appendix C. Well Seal including but not limited to: Well name
	gaskets present, bolts, all penetrations se (required Design Criteria Section 3.2.1)	aled DWR Well Permit No	gaskets p	resent, bolts, all penetrations sealed Design Criteria Section 3.2.1) DWR Well Permit No.
		Aquifer Name	Yes 🗖 N	□ □ Aquifer Name
	Vents screened with 24 Mesh screen (Re Design Criteria Section 3.2.1)	quired	Vents scr Design C	eened with 24 Mesh screen (Required
	Yes 🗋 No 🗋	Well head elevation above grade	Yes 🗖 N	
		(12 inch minimum)		
	Positive drainage slope away	WINDER CONTRACTOR	Positive c	Irainage slope away
	(Required Design Section 3.2.1)		from well (Required	for at least 20 feet I Design Section 3.2.1)
	Yes 🗖 No 🗖		Yes 🗖 N	
		Depth to Pitless line		
		feet		
		Grout Depth		
		feet		
	Screened Interval Depth, top		Screened	Interval Depth, top
	feet	Max pump rate gr	n feet	
		Nominal pump rate gr	1	
	Screened Interval Depth, bottom		Screened	Interval Depth, bottom
	feet			feet
		WELL #3R INSTALLATION DETAIL		
		N.T.S.		N.T.S.
REV No. DATE		DRAWN BY AS	A	
		DESIGNED BY: AS	— <u> </u>	POTABLE WATER TREATMENT IMPRO
		FILE PRINTED ON: 1/15/2020 11: 08: 41 AM		
		COPYRIGHT: AQUAWORKS DBO, INC.	Δημιλ/Ληγία	DRO
		01 IF THIS BAR DOES NOT READ 1"		DENVER, COLORADO 80205
1		DRAWING IS NOT LABELED TO SCAL	5	(303) 477–5915 6 7
1		$\sim$ $1$ $\tau$ $1$	$\sim$ I	· · · · · · · · · · · · · · · · · · ·



DISTRICT ROVEMENTS	SHEET TITLE: WELL INSTALLATION DETAILS						
Y, COLORADO	PROJECT NUMBER:	SCALE:		SHEET:			
	<b>#</b> 1745	TE	3D	G6			
8	9	9 1					





8	9			10	Л
					А
32'-8" TANK I.D.				, ,	в
	D.F. EL. 16'-9" MJK EXPERT 7070 W/RE EXTEND TO TANK BOTTO	ADOUT M		~	с
	6" OVERF MANUFAC 24" AIR GAP INSTALL 6" PRO- PROFLEX 730 CHECK VALVE C PIPE END	FLOW LINE BY	4 WST3		D
	4" DI FC B' 4" DI MJ ELBOW 4" DI DRAIN LINE 		200000 ADO Li 38169		E
NK SECTION A WST2 DISTRICT ROVEMENTS Y, COLORADO	SHEET TITLE: WATER STORAG	E TANK PLAN &	1/15/20	SHEET:	F
	#1745	3/16" =	= 1'-0"	WST2	
ð	9			10	



















5

6

#### EQUIPMENT NOTES:

 $\langle 1 \rangle$  1/2" BALL VALVE

 $\langle 2 \rangle$  CALIBRATION COLUMN

(3) PRESSURE GAUGE (200 PSI)

4

4 HDPE BACK PANEL AND STAND

5 DUPLEX GFCI OUTLET

 $\langle 6 \rangle$  1/4" CHEM FEED TRANSLUCENT SUCTION LINE FROM TANK

 $\langle 7 \rangle$  1/4" CHEM FEED TRANSLUCENT DISCHARGE LINE TO INJECTION QUILL

(8) PULSATRON LPG4EA-KTC1 CHEMICAL FEED PUMP

(9) PULSAFEEDER 1/2" PRESSURE RELIEF VALVE

(10) PULSAFEEDER 1/2" BACK PRESSURE VALVE

#### GENERAL NOTES:

1) USE VITON COMPONENTS FOR SODIUM HYPOCHLORITE SKID AND EPDM COMPONENTS FOR SODA ASH.

2) ITEMS 1-5 INCLUDED IN USABLUEBOOK SKID. ALL OTHERS SUPPLIED SEPARATELY.

NOTES:
1. PROVIDE SUITABLE SUBGRADE FOR
STABLE INSTALLATION.
2. ENCASE BOLLARD IN A MINIMUM OF
18" DIAMETER OF CONCRETE TO 4' BELOW
GRADE.
3. FILL PIPE WITH CONCRETE AND
PROVIDE CLEAN CAP FOR TOP OF PIPE.
4. <u>CONCRETE</u> : CONCRETE MIX SHALL
YIELD A COMPRESSIVE STRENGTH OF NOT
LESS THAN 4,000 PSI AFTER 28 DAYS.
MINIMUM UNCOVERED CURING TIME TO BE
36 HOURS.
5. PROVIDE 8' LONG STEEL PIPE. BOLLARD
TO BE COATED WITH ZINC CHROMATE
PRIMER PRIOR TO INSTALLATION. PAINT
OUTSIDE OF PIPE WITH RUST-RESISTANT
PAINT COLOR PER OWNER'S SPECIFICATION



o:	DATE:	BY:	REVISION DESCRIPTION:	DRAWN BY: AS						PROJECT: ARABIAN ACRES METRO	OPOLITAN DISTRICT
				DESIGNED BY: AS						POTABLE WATER TREAT	IMENT IMPROVEMENTS
				BEGIGITED BILING						UNINCORPORATED TELL	ER COUNTY, COLORA
				FILE PRINTED ON: 1/2	15/2020 11:08:41 AM					ENGINEER: AQUAWORKS DBO, INC.	
				COPYRIGHT: AQUAWOF	RKS DBO, INC.			Morks	$\mathbf{DR}()$	3252 WILLIAMS STREET	
				0	1 IF THIS BAR DOES NOT READ 1"		Inqua			DENVER, COLORADO 80	)205
					DRAWING IS NOT LABELED TO SCA	LE I		BOILD OILINIL		(303) 477–5915	
			2	3	4	5	5	6	5	7	8







8	9		10					
CONTROL DETAIL N	<u>OTES:</u>							
ACTOR TO REMOVE ACCO DIECTION FEATURE HEIG TION FOR PROPER FUNC ENCE POSTS SHALL BE I . METAL POSTS SHALL OF 1.33 POUNDS PER M DIAMETER OR CROSS BE ATTACHED TO POST ENCE SHALL BE INSTALL Y GRUBBING OR GRADING THE SULT FENCE WHEN	UMULATED SEDIMENT W HT. CONTRACTOR SH/ CTION. METAL OR WOOD WITH BE "STUDDED TEE" OI LINEAR FOOT. WOOD SECTION OF 2 INCHES S WITH THREE OR MOF ED IN LOCATIONS SPEC G ACTIVITY. SEDIMENT LT ACCLIMINATES TO	WHEN IT REACHES ALL PERFORM CON A MINIMUM LENGT ("U" TYPE WITH POSTS SHALL HAV SILT FENCE GEC (SILT FENCE GEC (STAPLES PER F CIFIED IN THE PLA ONE HALE THE FX	ONE THIRD TINUOUS H OF 42 A MINIMUM /E A DTEXTILE POST. NS PRIOR /ED FROM POSED	A				
TILE HEIGHT AND SHALL BE DISPOSED OF. V LOGS: EROSION LOGS SHALL BE CURLED ASPEN WOOD EXCELSIOR WITH ISTENT WIDTH OF FIBERS EVENLY DISTRIBUTED THROUGHOUT THE LOG. SING SHALL BE SEAMLESS, PHOTODEGRADABLE TUBE NETTING AND SHALL INIMUM DIMENSIONS AS SHOWN BELOW. THE CURLED ASPEN WOOD OR SHALL BE FUNGUS FREE, RESIN FREE AND SHALL BE FREE OF GROWTH MINATION INHIBITING SUBSTANCES. STAKES TO SECURE EROSION LOGS CONSIST OF PINEWOOD OR HARDWOOD. NTRACTOR SHALL MAINTAIN THE EROSION LOGS DURING CONSTRUCTION TO T SEDIMENT FROM PASSING OVER OR UNDER THE LOGS OR FROM NT ACCUMULATION GREATER THAN 30% OF THE ORIGINAL EXPOSED HEIGHT H EROSION LOG. STAKES SHALL BE EMBEDDED A MINIMUM OF DEPTH OF								
<sup>es.</sup> <u>Control specific</u> a	ATIONS:							
M <u>ENSIONS OF EROSION I</u> LENGTH 7—10 FEET	<u>LOGS:</u> WEIGHT 2.5 LBS/FOOT	STAKE DIMENSI 1.5X1.5X24 INC	ONS CHES	С				
<u>FOR SILT FENCE:</u> NGTH, N (LBS) I, % MIN	SPECIFICATION 400 (90) 50 MAXIMUM	TEST ASTM ASTM	METHOD D 4632 D 4632					
UPENING SIZE T DEGRADATION TY S-1	0.84 MAXIMUM 70% STRENGTH RET (AT 500 HOURS) 0.01 MINIMUM	ASTM FAINED ASTM ASTM PERCENT	D 4751 D 4355 D 4491 BROADCAST	D				
SPECIES BLUE GRAMA LITTLE BLUESTEM SHEEP FESCUE ARIZONA FESCUE INDIAN RICEGRASS CANBY BLUEGRAS WESTERN WHEATG THICKSPIKE WHEA TOTAL: NOTE: PROVIDE M	VARIETY LOVINGTON PASTURE COVER REDONDO S PALOMA S CANBAR RASS ROSANA TGRASS CRITANA	OF MIX 20 15 15 10 10 10 10 10 10 10 700%	PLS LBS/AC 1.2 2.1 1.4 0.9 2.5 0.6 3.2 2.2 14.1 LBS/AC	E				
<u>SEED MIX AN</u> NTS	D MULCH 4							
DISTRICT ROVEMENTS Y, COLORADO	SHEET TITLE: EROSION CONT	Rol Details		F				
	PROJECT NUMBER: #1745	SCALE:	SHEET: CB9					
8	9		10					



	1	2	.3		4	5		6 7
					DEFERRED STRUCTURAL SUBMITTAL	<u>.</u>	2.	THE SPECIFICATIONS AND STRUCTURAL DRAWINGS REPRESENT THE FINISHED
		<u>design paramet</u>	<u>ERJ</u>	1.	THE FOLLOWING STRUCTURAL COMPONENT	S SHALL BE DESIGNED AND		STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION, UNLESS
1.	BUIL	ILDING CODE 2015 IBC	WITH TCBC AMMENDMENTS		SUBMITTED BY OTHERS FOR APPROVAL IN	ACCORDANCE WITH DRAWINGS		MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATION OF
2.	LIVE	E LOADS			AND SPECIFICATIONS.			CONSTRUCTION AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL
	Α.	ROOF	20 PSF	0	A. FILE-ENGINEERED FIDERGEASS BUILDIN		3	THE SIZE AND LOCATION OF FOUIPMENT PADS AND PENETRATIONS THROUGH
3.	ROO	OF SNOW LOAD		2.	DOCUMENTS FOR DEFERRED STRUCTURAL DESIGNED, SEALED AND SIGNED BY A PRO	SUBMITTAL TIEMS SHALL BE OFESSIONAL ENGINEER LICENSED IN	0.	THE STRUCTURE FOR MECHANICAL, ELECTRICAL, AND PLUMBING WORK SHALL
	Α.	GROUND SNOW LOAD. Pa	40 PSF		THE STATE WHERE THE PROJECT IS LOCA	TED. THE DEFERRED SUBMITTAL		BE VERIFIED BY THE CONTRACTOR. PENETRATIONS SHALL BE SUBJECT TO
	R	FLAT ROOF SNOW LOAD Pf	40 PSF		DOCUMENTS SHALL BE SUBMITTED TO THE RECORD WHO SHALL REVIEW THEM AND F	- ARCHITECT OR ENGINEER OF		PLAN DRAWINGS FOR OPENING LOCATIONS NOT SHOWN ON THE STRUCTURAL
	С.	SNOW EXPOSURE FACTOR. Ce	1.0		OFFICIAL AS REQUESTED WITH A NOTATION	N INDICATING THAT THE DEFERRED	4	DRAWINGS.
4	D	SNOW LOAD IMPORTANCE FACTOR L	11		SUBMITTAL DOCUMENTS HAVE BEEN REVIE	WED AND BEEN FOUND TO BE IN	4.	DRAWINGS OR USE ANY DIMENSIONS TAKEN FROM ELECTRONIC DRAWING FILES.
	F	THERMAL FACTOR Ct	11		SUBMITTAL ITEMS SHALL NOT BE INSTALLI	ED UNTIL THE DESIGN AND	5.	ASSUME EQUAL SPACING IF NOT INDICATED ON DRAWINGS.
4	WINF	ID DESIGN DATA			SUBMITTAL DOCUMENTS HAVE BEEN APPR	OVED BY THE BUILDING OFFICIAL.	6.	ARCHITECTURAL, MECHANICAL AND ELECTRICAL COMPONENTS AND SYSTEMS
'.	Δ	LI TIMATE WAR SPEED (3 SECOND CLIST) V 1	130 MPH (Vacd-100 MPH)					SHALL BE DESIGNED AND CONSTRUCTED TO RESIST SEISMIC FORCES AS
	Π.	DICK CATECODY	130 MFH (VUSU-100 MFH)		PRE-ENGINEERED FIBERGLASS BUILDING			DETERMINED IN ASCE 7.
3	В.	RISK CATEGORT		1.	MANUFACTURER AND SHALL COMPLY WITH TH	ENTS SHALL BE DESIGNED BY THE E REQUIREMENTS OF LOCAL BUILDING		FOUNDATIONS
	C.	WIND EXPOSURE CATEGORY	(		CODES AS LISTED IN "DESIGN PARAMETERS" A	AND THE FIBERGLASS BUILDING	1	FOOTING DESIGNS ARE BASED ON AN ALLOWABLE SOIL BEARING PRESSURE
	D.	INTERNAL PRESSURE COEFFICIENT, GCDI	+/- 0.18		BUILDING ELEMENTS SHALL BE DESIGNED FOR	AL. IN ADDITION, THE FIBERGLASS ALL LOADS INDICATED ON THE		OF 2,000 PSF BASED ON THE GEOTECHNICAL REPORT BY KUMAR &
	E.	DESIGN WIND PRESSURE ON MAIN WIND FORCE RESISTING SYSTEM (MWERS) (ASD)	+/- 0.18		DRAWINGS.			ASSOCIATES, INC. DATED MAY 10, 2019.
		1) WALLS		2.	THE FIBERGLASS BUILDING MANUFACTURER IS RE	ESPONSIBLE FOR PROVIDING	2.	CONTRACTOR AND TESTING LABORATORY REPRESENTATIVE SHALL READ THE GEOTECHNICAL REPORT AND BECOME THOROUGHLY FAMILIAR WITH SITE AND
-		WINDWARD	1.3 PSF		TYPE, DIAMETER, AND LOCATION OF ANCHOR BOL	TS FOR THE FIBERGLASS BUILDING.		SUBGRADE INFORMATION GIVEN THEREIN. THE CONTRACTOR SHALL BE
		LEEWARD	-8 PSF	3.	THE FIBERGLASS BUILDING SHALL BEAR AS INDIC	CATED ON PLANS.		RESPONSIBLE FOR DETERMINING EXACT QUANTITIES OF CUT AND FILL FOR ESTIMATING AND CONSTRUCTION SUBGRADE SHALL BE PREPARED AS NOTED
		2) ROOF	0 1 5	4.	DEFLECTION LIMITS SHALL BE IN ACCORDANCE	WITH THE REFERENCED BUILDING		IN THE GEOTECHNICAL REPORT.
		0_8 FT	_18 PSF		FINISHES SPECIFIED. BUILDING MANUFACTURE	R SHALL BE RESPONSIBLE FOR	3.	A QUALIFIED AND REGISTERED GEOTECHNICAL ENGINEER, LICENSED IN THE
			10 1 51	5	DETERMINATION OF DEFLECTION LIMITS.			LABORATORY, SHALL DETERMINE CONFORMANCE OF THE FOUNDATION BEARING
			-12 PSF	J.	THE SEAL OF A PROFESSIONAL ENGINEER LICENS	ED IN THE STATE WHERE THE PROJECT		STRATA WITH THE FOUNDATION DESIGN CRITERIA ABOVE, AND ALL OTHER
	F	UVERHANGS Design wind pressure on components	-28 PSF		IS LOCATED. INCLUDE FOUNDATION REACTIONS OF	F ALL FRAMING MEMBERS ON THE SHOP		ARCHITECT AND CONSULTING ENGINEER OF ANY CONDITIONS NOT IN
	1.	AND CLADDING (ASD)			ULTIMATE OR SERVICE LOADS. INDICATE WHICH L	OAD COMBINATION APPLIES THE		ACCORDANCE WITH FOUNDATION DESIGN CRITERIA OR CONTRACT DOCUMENTS.
		1) WALLS (20 SQUARE FEET EFFECTIVE		C	LARGEST LOAD TO FOUNDATIONS.		4.	CONCRETE SLAB AND FOOTINGS SHALL BEAR ON A MINIMUM OF 1 FOOT OF
		WIND AREA)		0.	BUILDING HAVE BEEN DESIGNED FOR PINNED TYP	E CONNECTIONS ONLY. DO NOT FIX THE		WITH LIMITATIONS NOTED IN THE GEOTECHNICAL REPORT. PROVIDE
-		END ZONES	26 PSF	-	BASE OF THE FIBERGLASS BUILDING WALLS.			STRUCTURAL FILL DIRECTLY BELOW THE BUILDING AND 5 FEET BEYOND THE
		INTERIOR ZONES	21 PSF	7.	A 1/3 INCREASE IN ALLOWABLE STRESS SHALL N LOAD REDUCTION SHALL BE ALLOWED IN ACCORD	NOT BE USED FOR DESIGN. HOWEVER, A DANCE WITH ASCE-7 WHEN TWO OR		OF PERIMETER FOOTINGS AS NOTED IN THE GEOTECHNICAL REPORT.
		2) ROOF (GROSS UPLIFT) -20 SQUARE			MORE TRANSIENT LOADS IN COMBINATION WITH D	EAD LOADS ARE APPLIED.	5.	EXTERIOR FOOTINGS SHALL BEAR AT OR BELOW MINIMUM BEARING DEPTH.
		FEET EFFECTIVE WIND AREA		8.	FIBERGLASS BUILDING MANUFACTURER SHALL PR	ROVIDE ROOF BRACING, WALL BRACING		MINIMUM FROST DEPTH IS 30 INCHES BELOW ADJACENT FINISHED GRADE.
			4/ YSF		LOADS. THEIR LOCATIONS AND SIZES SHALL BE	COORDINATED WITH THE ARCHITECTURAL	б.	PROVIDE UNIFORM BEARING SURFACE FOR SLABS AND FOOTINGS WITH 6 INCHES OF CLASS 1 MATERIAL, PROPERLY COMPACTED AS NOTED IN THF
		END ZONES	J4 PSF	<u>^</u>	AND ENGINEERING DRAWINGS AND INTENT.			GEOTECHNICAL REPORT.
	0	INTERIUR ZUNES	22 PSF	У.	ABOVE SLAB OR TOP OF FOUNDATION PILASTER	AND WALL ELEVATIONS, WHICHEVER IS	7.	AVOID DAMAGE TO UNDERGROUND UTILITIES SUCH AS WATER MAINS,
	G.	WIDTH OF END ZONES	3.0		HIGHER. THIS INCLUDES, BUT IS NOT LIMITED TO,	WIND GIRTS AND COLUMNS, EXTERIOR		ADJOIN SITE.
5.	EAR	RTHQUAKE DESIGN DATA			SUPPLEMENTAL FRAMING SHALL MEET OR EXCEED	D THE LOAD AND DEFLECTION	8.	DO NOT PLACE CONCRETE ON FROZEN SUBGRADE OR ON SUBGRADE
	A.	SEISMIC IMPORTANCE FACTOR, I	1.25		REQUIREMENTS OF THE MANUFACTURER.			CONTAINING FROZEN MATERIALS. VERIFY THAT FORMS, REINFORCING STEEL
	В.	MAPPED SPECTRAL RESPONSE ACCELERATION SS	24./%	10.	THE FIBERGLASS BUILDING MANUFACTURER IS RE FIBERGLASS BUILDING ELEMENTS WITH THE CONS	ESPONSIBLE FOR COORDINATING STRUCTION DRAWINGS AND INTENT.		AND ADJACENT CONCRETE SURFACES ARE FREE OF FROST, SNOW AND ICE AND THAT TEMPERATURE OF THESE MATERIALS IS ABOVE 32 DEGREES F
	C.	MAPPED SPECTRAL RESPONSE	6.5%	11.	NO OVERSTRESS OF FIBERGLASS BUILDING MEMB	BERS IS ALLOWED.		BEFORE PLACING CONCRETE.
		ACCELERATION, S1	0.070					
	D.	SITE CLASS	С					
-	E.	SPECTRAL RESPONSE COEFFICIENT, Sds	0.198			NOTES		
	F.	SPECTRAL RESPONSE COEFFICIENT, Sd1	0.074		GENERAL	INVILO		
	G.	SEISMIC DESIGN CATEGORY	В		GENERAL			
				1.	STRUCTURAL ELEMENTS ARE NON-SELF SUF	PPORTING AND REQUIRE		
wa	llace il	AND REAL			LATERAL FORCES. FRAMING AND WALLS SH	ALL BE TEMPORARILY BRACED BY		

Structural and Civil Consultants, Inc. 9800 Pyramid Court, Suite 350 Englewood, Colorado 80112 303 350-1690, Fax 303 350-1694 www.wallacesc.com

REV. No: DATE: BY: REVISION DESCRIPTION:

KN V



INTERACTION WITH OTHER ELEMENTS FOR STABILITY AND RESISTANCE TO LATERAL FORCES. FRAMING AND WALLS SHALL BE TEMPORARILY BRACED BY THE CONTRACTOR UNTIL PERMANENT BRACING, FLOOR AND ROOF DECKS, AND WALLS HAVE BEEN INSTALLED AND CONNECTIONS BETWEEN THESE ELEMENTS HAVE BEEN MADE.

DRAWN BY: RM DESIGNED BY: PJ FILE PRINTED ON: 10/07/2019 COPYRIGHT: AQUAWORKS DBO, INC. 0 1 IF THIS BAR DOES NOT READ 1" DRAWING IS NOT LABELED TO SCALE 3 4

AquaWorks DBO

PROJECT: ARABIAN ACRES METROPOLITAN DIST POTABLE WATER TREATMENT IMPROV TELLER COUNTY, COLORADO ENGINEER: AQUAWORKS DBO, INC. 3252 WILLIAMS STREET DENVER, COLORADO 80205 (303) 477-5915

5	3	9		1	0	
	<u>CONCRETE</u>					
1.	CONCRETE SPECI A. EXTERIOR ( FREEZE-TH EXPOSED T = 4500 PS RATIO OF EXTERIOR S OF 6% +/ AND LARG FOR CONCE EXPOSUBE	FICATIONS SHALL BE AS CONCRETE AND INTERIOR HAW, AND CONCRETE SLA TO THE EXTERIOR: MINIMI SI. PROPORTIONED TO H 0.45. SLUMP = 3" - 5 SHALL BE AIR-ENTRAINE - 1% BY VOLUME PER A ER. REFERENCE ACI 318 RETE EXPOSED TO CYCLE CLASS 52 FOR SMALLE	FOLLOWS: CONCRETE EXP( ABS AND WALLS JM 28 DAY COM IAVE A MAXIMUM ". ALL CONCRE D WITH MINIMUM STM C231 FOR 3 B TABLE 4.4.1, TH CS OF FREEZING R ACCRECATE SI	DSED TO PERMANENTLY PRESSIVE STRI I WATER/CEME TE EXPOSED T TOTAL AIR CO 3/4" AGGREGA DTAL AIR CON AND THAWING, 7ES	ENGTH NT O THE DNTENT .TE TENT	A
	B. PORTLAND	CEMENT SHALL CONFORM	M TO ASTM C-1	50, TYPE I OR	II.	
	C. AGGREGATE	ES FOR NORMAL WEIGHT	CONCRETE SHAL	L		
2.	MATERIALS OR A	DMIXTURES SHALL NOT (	CONTAIN ANY CA	LCIUM CHLORI	DE.	
3.	REINFORCING STE	EL SHALL MEET THE FO	LLOWING:			
	A. DEFORMED B. WELDED WI	BARS AS RE FABRIC AS	SIM A615, GRADE STM A185	- 60		В
4.	WHERE DOWELS A MATCH SIZE AND WITH THE MAIN F AS NOTED IN TH	ARE INDICATED BUT NOT ) LOCATION OF MAIN REI REINFORCING STEEL. REIN E REINFORCING LAP SCH	SIZED, PROVIDE NFORCEMENT STE IFORCING BARS S EDULE.	DOWELS THAT EEL AND LAP SHALL BE SPLI	- SPLICE ICED	
5.	REFER TO ACI 3 EDITION FOR DET EDITION FOR STA REFER TO ACI 30 PROCEDURES.	18 LATEST EDITION FOR AILING PRACTICES AND I NDARD PRACTICE FOR M 06R-16 FOR REQUIRED C	CONCRETE COVE FABRICATION, AN IIXING AND PLAC COLD WEATHER C	R, ACI 315 LA D ACI 301 LA ING CONCRETE CONCRETING	TEST TEST	
6.	PROVIDE CORNER SIZE AND QUANT	R BARS THAT MATCH AND TTY AT INTERSECTIONS A	D LAP CONTINUC	US REINFORCE WALLS AND	MENT	
7.	FOUNDATIONS. RI ANCHORS INSTAL SPECIFIED ON TH POST-INSTALLED HOLES SHALL BE ACCORDANCE WT AND APPLICABLE EMBEDMENT. SU	LF 2-S3. LED IN HARDENED CONC IE CONTRACT DRAWINGS. ANCHORS TO AVOID CO IDRILLED, DRY AND CLE TH THE MANUFACTURERS ESR REPORT. REFEREN IBSTITUTION REQUESTS F	RETE SHALL BE CARE SHALL BE NFLICTS WITH EX ANED AND ANCH S PUBLISHED WRI ICE DETAILS FOR OR PRODUCTS O	USED WHERE TAKEN IN PL XISTING REINFO IORS INSTALLE TTEN INSTRUC ANCHOR SIZE THER THAN TH	ACING RCING. D IN TIONS E AND 10SE	
	SPECIFIED ON TH CONTRACTOR TO ARE SIGNED AND RESPONSIBLE FOI THE PROJECT IS THE SUBSTITUTED EQUIVALENT PERI USING THE APPR REQUIRED BY TH POST-INSTALLED A. HILTI HIT-RE B. HILIT HIT-HY	IE CONTRACT DRAWINGS THE ENGINEER-OF-REC D SEALED BY THE QUALIF R THEIR PREPARATION A LOCATED. THE CALCUL. D PRODUCT IS CAPABLE FORMANCE VALUES (MINI COPRIATE DESIGN PROCE E BUILDING CODE. ALLC ANCHORS IN CONCRETE 500-SD EPOXY ADHESI 7 200 ADHESIVE (ICC-ES	SHALL BE SUBM ORD ALONG WITH TED PROFESSION ND LICENSED IN ATIONS SHALL D OF ACHIEVING T MUM) OF THE SF DURE AND/OR ST WABLE SUBSTITL ARE: VE (ICC-ES ESR ESR-3187)	ITTED BY THE I CALCULATION AL ENGINEER THE STATE W EMONSTRATE " PECIFIED PROD FANDARD(S) A: JTIONS FOR -2322).	IS THAT HERE IHAT UCT S	D
8.	C. HILTI KWIK B D. SIMPSON STF E. SIMPSON STF F. SIMPSON STF ESR-3037). CONTROL JOINTS	OLT TZ EXPANSION ANCI RONG-TIE SET-XP EPOX' RONG-TIE AT-XP ADHESI RONG-TIE STRONG BOLT SHALL BE LOCATED AS	HOR (ICC-ES ES Y ADHESIVE (ICC VE (IAPMO UES 2 WEDGE ANCHO SHOWN ON PLAY	R-1917). -ES ESR-2500 ER-263). )R (ICC-ES NS OR AS DIR	B). ECTED	F
	WITHOUT CONSTR	NAL ENGINEER, SLAB SP RUCTION JOINTS.	IALL DE PLAUEU	IIN A SINGLE	Γυυκ	
						F
STRICT VEMEN	NTS	SHEET TITLE: STRUCTURAL NOTE	S & SPECIFICA	TIONS		
		PROJECT NUMBER:	SCALE:		SHEET:	
		#1745	N.	T.S.	S1	
	3	9		1	0	



8	9	10

					Ľ.
ISTRICT OVEMENTS	SHEET TITLE: FOUNDATION PLAN				
	PROJECT NUMBER:	SCALE:		SHEET:	
	#1745	1/4" =	= 1'-0"	S2	
8	9		1	0	

1 2 3	4	5	6	7	8	9	10
	+	6" DIA. MAX. (ADJUST FOR PIPE SIZE)	← PVC SLEEVE ← URETHANE SEALANT	STEEL	REINF. LAP	SCHEDULE	A
3	9* MIN	CARRIER PIPE SIZE VARIES	<ul> <li>BACKER ROD</li> <li>REBAR AS INDICATED ON FOUNDATION PLAN</li> <li>1/2" THK EXP JT MATERIAL</li> <li>REF FOUNDATION PLAN NOTE #1 FOR SLAB INFORMATION</li> </ul>	BAR         COI           SIZE         TOP           3         17           4         23           5         28           6         34           7         49           8         56	NCRETE         LAP         SPLICE           =         3000psi         f'           0THER         16           18         22           26         38           43         43	$\begin{array}{c c} (\text{CLASS B)} & (\text{IN}) \\ \hline c &= 4500 \text{psi} / 5000 \text{psi} \\ \hline \text{TOP} & \text{OTHER} \\ \hline 16 & 16 \\ \hline 19 & 16 \\ \hline 23 & 18 \\ \hline 28 & 21 \\ \hline 40 & 31 \\ \hline 46 & 35 \\ \hline \end{array}$	В
	5 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3 S3	E: OR FOUNDATION WALL PENETRATION PROVIDE 1 CARRIER PIPE AND SEAL WITH URETAHNE SEALA DOR PENETRATIC CALE	' annular space around int only to permit movement. Int DETAIL	4 STEEL RE	EINFORC	ING LAP SCHE	DULE
SAWCUT 1/8"x"T"/4 DEEP SAWCUT 1/8"x"T"/4 DEEP SAWCUT 1/8"x"T"/4 DEEP SAWCUT 1/8"x"T"/4 DEEP G" CLASS 1 MATERIAL (REF. GENERAL FOUNDATION NOTE #6 ON SHEET S1) SCALE: 1/2" = 1'-0"	PROVIDE MATCHING CORNER BARS TO LAP WITH INSIDE AND OUTSIDE HORIZ. REINF.	A-S3 TYP. HORIZ. REINF., REF. DETAILS	NO STOOP AT SIM #4 CONT T.O. SLAB ELEV. TURNDOWN (2) #4 CON (2) #4 CON NON-FROST SUSCEPTIBL GRANULAR	1/2" DIA x 3 5/8" EXPANSION ANCHOR (REF. GENERAL CONCRETE NOTES ON S1) SPAN ANCHORS AT 24" O.C. MAX. 1/2"x8" SMOOTH DOWELS AT 16" O.C., CENTER ON JOINT 4" THICK STOOP WITH #4 AT 16" O.C. E.W. SLOPE (3) SIDES (3) SIDES (3) SIDES (4) (4) (5) (5) (6) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7	2e. MIN. BELOW EXTERIOR GRADE #5 ON SI) #5 ON SI) #5 ON SI) #5 ON SI) #5 ON SI) #5 ON SI) #6 ON SI) #6 ON SI) #6 ON SI) #6 ON SI) #6 ON SI) #7 ON SI #6 ON SI) #6 ON SI) #6 ON SI #7 ON SI #6 ON SI	MIN. IR. EDGE ANCE F. The second	C DING S AT $\begin{bmatrix} 2'-0"\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $
Structural and Civil Consultants, Inc. 9800 Pyramid Court, Suite 350 Englewood, Colorado 80112 303 350-1690, Fax 303 350-1694 www.wallacesc.com	2 S3 <b>TYPICAL CON</b> SCALE: 1/2" = 1'-0"	NCRETE CORNER	TYPIC 1 S3 SCALE: 1/2'	CAL SECTION	1	1 GENERAL FOU #6 ON SHEET	NDATION NOTE S1)
REV. No:     DATE:     BY:     REVISION DESCRIPTION:     DRAWN       DESIGNE     DESIGNE     DESIGNE       DESIGNE     DESIGNE </td <td>BY: RM D BY: PJ INTED ON: <b>01/15/2020</b> GHT: AQUAWORKS DBO, INC. 1 IF THIS BAR DOES NOT READ 1" DRAWING IS NOT LABELED TO SC/ 4</td> <td>ALE 5</td> <td>PROJEI PROJEI ENGINE 6</td> <td>CT: ARABIAN ACRES METROPOLITAN DIST POTABLE WATER TREATMENT IMPROV TELLER COUNTY, COLORADO EER: AQUAWORKS DBO, INC. 3252 WILLIAMS STREET DENVER, COLORADO 80205 (303) 477–5915 7</td> <td>RICT S EMENTS F 8</td> <td>SHEET TITLE: FOUNDATION DETAILS PROJECT NUMBER: SCALE: #1745 1/2" = 9</td> <td>F SHEET: 1'-0" S3</td>	BY: RM D BY: PJ INTED ON: <b>01/15/2020</b> GHT: AQUAWORKS DBO, INC. 1 IF THIS BAR DOES NOT READ 1" DRAWING IS NOT LABELED TO SC/ 4	ALE 5	PROJEI PROJEI ENGINE 6	CT: ARABIAN ACRES METROPOLITAN DIST POTABLE WATER TREATMENT IMPROV TELLER COUNTY, COLORADO EER: AQUAWORKS DBO, INC. 3252 WILLIAMS STREET DENVER, COLORADO 80205 (303) 477–5915 7	RICT S EMENTS F 8	SHEET TITLE: FOUNDATION DETAILS PROJECT NUMBER: SCALE: #1745 1/2" = 9	F SHEET: 1'-0" S3

8	9



## Potable Water Distribution and Treatment Improvement Project



## Specification Manual Preliminary – Not for Construction

Arabian Acres Metropolitan District

Unincorporated Teller County, Colorado

January 2020

AquaWorks DBO, Inc. 3252 Williams Street Denver, Colorado 80205 (303) 477-5915



### TABLE OF CONTENTS

SECTION 00 11 13 – INVITATION TO BID	4
SECTION 00 12 00 - INSTRUCTIONS TO BIDDERS	6
SECTION 00 41 13 - BID FORM	15
SECTION 00 41 20 - BIDDER QUALIFICATION REQUIREMENTS	22
SECTION 00 41 20 - EXHIBIT A: BIDDER QUALIFICATION STATEMENT	24
SECTION 00 41 10 - EXHIBIT B: CERTIFICATION OF BIDDER'S EXPERIENCE AND QUALIFICATIONS	
SECTION 00 52 15 - AGREEMENT FORM	
SECTION 00 52 16 - PERFORMANCE BOND	
SECTION 00 52 17 - PAYMENT BOND	46
SECTION 00 52 18 - BID BOND	
SECTION 00 72 15 - GENERAL CONDITIONS	53
SECTION 00 73 14 - SUPPLEMENTARY CONDITIONS	121
SECTION 00 95 00 – STATE REVOLVING FUND SPECIFICATIONS	132
SECTION 01 10 00 - SUMMARY	168
SECTION 01 25 00 - SUBSTITUTION PROCEDURES	172
SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS	174
SECTION 01 33 00 - SUBMITTAL PROCEDURES	177
SECTION 01 40 00 - QUALITY REQUIREMENTS	
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS	
SECTION 01 60 00 - PRODUCT REQUIREMENTS	
SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS	
SECTION 01 91 00 - COMMISSIONING	
SECTION 03 10 00 - CONCRETE FORMING AND ACCESSORIES	193
SECTION 03 30 00 - CAST-IN-PLACE CONCRETE	199
SECTION 03 39 00 - CONCRETE CURING	
SECTION 31 05 13 - SOILS FOR EARTHWORK	
SECTION 31 22 13 - ROUGH GRADING	207
SECTION 31 23 16 - EXCAVATION	210
SECTION 31 23 17 - TRENCHING	212
SECTION 31 23 23 - FILL	215
SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS	

SECTION 33 05 07 - TRENCHLESS INSTALLATION OF UTILITY PIPING	. 220
SECTION 33 11 12 – POTABLE WATER SUPPLY WELLS	.232
SECTION 33 11 13 - PUBLIC WATER UTILITY DISTRIBUTION PIPING	.242
SECTION 33 13 00 - DISINFECTING OF WATER UTILITY DISTRIBUTION	.247
SECTION 33 13 13 - WATER STORAGE TANK DISINFECTION	. 249
SECTION 40 05 23.15 - GATE VALVES	.251
SECTION 43 41 11 - BOLTED STEEL TANKS	.253

### SECTION 00 11 13 - INVITATION TO BID

### Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

Sealed Bids will be received by the ARABIAN ACRES METROPOLITAN DISTRICT, hereinafter referred to as the "District", **until 2:00 p.m., local time, Month xx<sup>th</sup>, 2020, for the Potable Water Distribution and Treatment Improvement Project.** Bids received after said closing time will not be accepted and will be returned unopened. A mandatory prebid meeting will be held at 10:00 a.m. on Month xx<sup>th</sup>, 2020.

At said place all Bids that have been duly received will be opened privately. Bids shall be in a sealed envelope plainly marked with the Project Name, Bidder's Name, and Date and shall be addressed as follows:

#### **Potable Water Distribution and Treatment Improvement Project**

Arabian Acres Metropolitan District Attn: Adam Sommers, District Engineer c/o AquaWorks DBO, Inc. 3252 Williams Street Denver, CO 80205

The work for this Contract generally includes the replacement of 30,000 +/- linear feet of 4" water distribution line, installation of a 100,000-gallon water storage tank, construction of two water treatment buildings, drilling 2 raw water wells, and associated improvements.

Bidding Information can be downloaded at <u>www.questcdn.com</u> under Login using QuestCDN #xxxxxx for a non-refundable charge of \$15.

Each Bid must be accompanied by a Bid security consisting of a Bid Bond, in the amount of five (5) percent of Bidder's Total Bid Price, without conditions, payable to the District. The successful Bidder will be required to furnish a **performance bond and a labor and material payment bond** guaranteeing faithful performance and the payment of all bills and obligations arising from the performance of the Contract.

The District reserves the right to award the contract by sections, to reject any or all Bids, and to waive any informalities and irregularities therein. Bids will be evaluated based on price and bidder qualifications.

The successful Bidder will be required to enter into an Agreement with the District using the form included in the Contract Documents. The District assumes no responsibility for payment of any expenses incurred by any respondent to this Invitation to Bid. Questions may be directed in writing to Adam Sommers at adam@aquaworksdbo.com.

Dated this XX<sup>th</sup> day of Month, 2020.

Edith Coffman, President Board of Directors Arabian Acres Metropolitan District

Publish: Month 2, 2020

#### SECTION 00 12 00 - INSTRUCTIONS TO BIDDERS

#### **ARTICLE 1—DEFINED TERMS**

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
  - A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

#### **ARTICLE 2—BIDDING DOCUMENTS**

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner requires that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 *Electronic Documents* 
  - A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
    - 1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
  - B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.04.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and

responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

#### **ARTICLE 3—QUALIFICATIONS OF BIDDERS**

- 3.01 Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:
  - A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
  - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
  - C. Subcontractor and Supplier qualification information.
  - D. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.04 To demonstrate Bidder's qualifications to perform the Work, within 5 days of Owner's request, Bidder shall submit written evidence such as financial data and present commitments.

#### **ARTICLE 4—PRE-BID CONFERENCE**

- 4.01 A mandatory pre-bid conference will be held at the time and location indicated in the invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Proposals will not be accepted from Bidders who do not attend the conference. It is each Bidder's responsibility to sign in at the pre-bid conference to verify its participation. Bidders must sign in using the name of the organization that will be submitting a Bid. A list of Bidders that attended the pre-bid conference and are eligible to submit a Bid for this Project will be issued in an Addendum.
- 4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

# ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

- 5.01 Site and Other Areas
  - A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-ofway, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.
- 5.02 Existing Site Conditions
  - A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

- 1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
  - a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
  - b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
  - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
  - d. Technical Data contained in such reports and drawings.
- 2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
- 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- B. Underground Facilities: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
- 5.03 Site Visit and Testing by Bidders
  - A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
  - B. A Site visit is scheduled following the pre-bid conference.
  - C. Bidders visiting the Site are required to arrange their own transportation to the Site.
  - D. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the Engineer. Bidder must conduct the required Site visit during normal working hours.
  - E. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
  - F. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
  - G. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established

by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

- H. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.
- 5.04 Owner's Safety Program
  - A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

#### **ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS**

- 6.01 *Express Representations and Certifications in Bid Form, Agreement* 
  - A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
  - B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

#### ARTICLE 7—INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing via the bidding website.
- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

#### **ARTICLE 8—BID SECURITY**

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the

case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

#### **ARTICLE 9—CONTRACT TIMES**

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

#### ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.
- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "orequal" or substitution requests are made at Bidder's sole risk.

#### ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 With the exception of the equipment specified for the project, contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.
- 11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening:
  - A. Electrical, HVAC, and plumbing contractors.
- 11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by

the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

#### **ARTICLE 12—PREPARATION OF BID**

- 12.01 The Bid Form is included with the Bidding Documents.
  - A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
  - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.
- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.
- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

#### **ARTICLE 13—BASIS OF BID**

- 13.01 Lump Sum
  - A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.
- 13.02 Base Bid with Alternates
  - A. Bidders must submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.
  - B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.
- 13.03 Unit Price
  - A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
  - B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
  - C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

#### ARTICLE 14—SUBMITTAL OF BID

- 14.01 The bid shall be completed and submitted with the following documents:
  - A. Bid Form
  - B. Bid Bond
  - C. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids.
  - D. Bidder Qualification Statement (Section 00 41 20: Exhibit A).
  - E. Certification of Bidder's Experience and Qualifications (Section 00 41 20: Exhibit B).
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID

ENCLOSED." A mailed Bid must be addressed to Arabian Acres Metropolitan District, c/o AquaWorks DBO, Inc., 3252 Williams Street, Denver, CO 80205.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

#### ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

#### **ARTICLE 16—OPENING OF BIDS**

16.01 Bids will be opened privately.

#### ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

#### **ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT**

- 18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.
- 18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.
- 18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.
- 18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.
- 18.05 Evaluation of Bids
  - A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
  - B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After

determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

- C. For determination of the apparent low Bidder(s) when sectional bids are submitted, Bids will be compared on the basis of the aggregate of the Bids for separate sections and the Bids for combined sections that result in the lowest total amount for all of the Work.
- D. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

#### **ARTICLE 19—BONDS AND INSURANCE**

- 19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.
- 19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

#### **ARTICLE 20—SIGNING OF AGREEMENT**

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

#### **ARTICLE 21—SALES AND USE TAXES**

21.01 Owner is exempt from state sales and use taxes. Refer to Supplementary Conditions for additional information.

#### END OF SECTION

#### SECTION 00 41 13 - BID FORM

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

#### **ARTICLE 1—OWNER AND BIDDER**

1.1 This Bid is submitted to:

Arabian Acres Metropolitan District

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

#### ARTICLE 2—ATTACHMENTS TO THIS BID

- 2.1 The following documents are submitted with and made a condition of this Bid:
  - A. Bid Form
  - B. Bid Bond
  - C. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids.
  - D. Bidder Qualification Statement (Section 00 41 20: Exhibit A).
  - E. Certification of Bidder's Experience and Qualifications (Section 00 41 20: Exhibit B).

#### ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

#### **Guidance Notes**

- 1. The provisions in Article 3 are intended to be used for bids on lump sum (stipulated price) contracts, including bids on unit price items. Typically, these Article 3 provisions are used in conjunction with C-520, Agreement Between Owner and Contractor for Construction Contract (Stipulated Price) (2018).
- 2. This Article 3 presents language for lump sum (three suggested formats), lump sum allowances (two formats), and unit price Bids. Note 14 to this Article 3 addresses the inclusion of a lump sum for an assigned procurement contract. Article 4 presents two suggested fee formats for bidding on a cost-plus-fee contract. Article 5 presents a price-plus-time (A+B) bidding option that may be used to determine the Successful Bidder, as a supplement to either a lump sum (stipulated price) or fee-based bid.
- 3. If the Contract to be awarded is a cost-plus-fee contract, see Article 4, and delete this Article 3.
- 4. In the typical situation in which the lump sum (stipulated price) contract will be awarded based primarily on price (low bid), delete Article 5, Price-Plus-Time Bid. If the lump sum (stipulated price) contract will be awarded on a price-plus-time (A+B) basis, retain appropriate portions of this Article 3 and supplement them with the provisions of Article 5, Price-Plus-Time Bid.
- 5. Provide sufficient space and arrange format so that Bidders will understand how to submit prices.
- 6. If alternate Bids are requested, it is preferable that they be all "deductive" or all "additive." Alternates should be clearly specified in Division 01 of the Specifications (General Requirements). The itemization in the Bid Form should be clearly identifiable and carefully follow the Division 01

presentation. The Instructions to Bidders should contain appropriate guidance for preparing the Bid. Alternates should be accepted in a particular order, which should be explained in the Instructions to Bidders. The alternates should be listed in the Bid Form in order of priority.

- 7. To minimize the risk of error and to ensure objectivity in comparison of Bids, a single lump sum Bid price for a complete project or section is preferable to a total price determined by the sum of a list of individual lump sum items.
- 8. Cash allowances are located in Paragraph 3.01.B below; contingency allowances in Paragraph 3.01.C.
- 9. Cash allowances, if such are to be used, should be clearly specified in Division 01 of the Specifications. Language such as the following is typically used in Division 01: "Allow the lump sum of \$[number] for the supply and installation of: 1) Amount and description of Cash Allowance 1; 2) Amount and description of Cash Allowance 2." Add the cash allowances and enter the sum in the Bid Form prior to making the Bid Form available to prospective Bidders.
- 10. Similarly, enter the Owner-established contingency allowance, if any, in the location indicated. If the contingency is to apply only to certain categories of the Work, or if there are to be multiple contingency allowances, revise as needed.
- 11. Allowances are addressed at Paragraph 13.02 of the General Conditions.
- 12. The following notes (13 through 18) apply only when a separate procurement contract entered into by the Owner (most commonly for the purchase of equipment) will be assigned to the Contractor.
- 13. Below is a suggested format for incorporating language into the Bid Form in support of the assignment of a procurement contract for the purchase by Owner (as "Buyer") of goods and special services from an equipment manufacturer (as "Seller"), where the Owner intends to assign the procurement contract to the Contractor.
- 14. Include a separate bid item for the procurement contract in the construction contract Bid Form, with the associated balance of the procurement contract price that will not yet have been paid by the Owner to the Seller at the time of the construction contract's Effective Date of the Contract. Thus, the construction Contract Price will include the unpaid balance of the procurement contract price, allowing the Contractor to invoice the Owner for payments that Contractor will make to the Seller after the assignment is effective, and ensure that the Contractor's performance bond and payment bond are each in an amount equal to the total price of construction plus the amount of the procurement contract for which the Contractor will be responsible. The Bid Form insert for an assigned procurement contract would typically be presented as follows:

Lump Sum Price for Contractor's payment obligation to [name of supplier or manufacturer], as "Seller," for goods and special services described in the [name equipment package and Procurement Contract No.].

Lump Sum for Purchase of Assigned Goods \$[amount entered by drafter of Bid Form]

Bidder is to include in other Bid item(s) the other costs, if any, associated with accepting such assignment and administering the assigned contract.

- 15. The amount to be stipulated for this bid item in the construction Bid Form will often be the total procurement contract price minus the amount paid by Owner to Seller for approval of the procurement contract shop drawings.
- 16. When the Contractor will furnish builder's risk or an installation floater insurance for the Work, the construction Contract Price of the total procurement contract amount will aid in attaining insurance coverage that is sufficient to cover the procured item.
- 17. When the construction will be implemented under multiple prime construction contracts, provisions relating to the assignment of the procurement contract should be included only on the construction Bid Form for the prime construction contract that is to incorporate the stipulated procurement contract bid item.
- 18. For additional information on assigning a procurement contract, refer to EJCDC® P-001, Commentary on the EJCDC Procurement Documents (2018). For other recommended language on assignment to be incorporated into the construction Bidding Requirements and construction Contract Documents, refer to EJCDC® P-200, Suggested Instructions to Bidders for Procurement Contracts.
- 19. If unit prices are requested, whether it be a wholly unit price contract, or as ancillary to a lump sum contract, use Paragraph 3.02. If unit prices are not requested, delete Paragraph 3.02.
- 20. Appropriate guidance to Bidders for completing the Bid Form as to unit price items should appear in the Instructions to Bidders, and details with respect to what is included in each unit price item should be included in the Specifications.
- 21. The drafter should provide an estimated quantity in the Bid Form for each unit price item as defined or indicated in the Specifications.
- 22. For further reference regarding unit prices, see Paragraph 13.03 of the General Conditions and Paragraph SC-13.03 of the Supplementary Conditions.

### 3.1 *Lump Sum Bids*

- 1. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum (stipulated) price(s), together with any Unit Prices indicated in Paragraph 3.02:
  - 1. Lump Sum Price (Single Lump Sum)

Lump Sum Bid Price	\$

2. Lump Sum Price (Base Bid and Alternates)

Lump Sum Bid Price for Base Bid	\$
Alternate A [Add] [Deduct]	\$
Alternate B [Add] [Deduct]	\$

3. Lump Sum Price (Sectional Lump Sum Bids)

Lump Sum Bid Price for Section I only	\$
Lump Sum Bid Price for Section II only	\$
Lump Sum Bid Price for Section I and II	\$

2. All specified cash allowance(s) are included in the price(s) set forth below, and have been computed in accordance with Paragraph 13.02 of the General Conditions.

Lump Sum for Cash Allowance 1	\$
Lump Sum for Cash Allowance 2	\$
Lump Sum for Cash Allowance 3	\$
Total for all Lump Sum for Cash Allowances	\$

3. All specified contingency allowances are included in the price(s) set forth below, and have been computed in accordance with Paragraph 13.02 of the General Conditions.

Lump Sum Contingency Allowance 1	\$
Lump Sum Contingency Allowance 2	\$
Lump Sum Contingency Allowance 3	\$
Total for all Lump Sum Contingency Allowances	\$

### 3.2 Unit Price Bids

1. Bidder will perform the following Work at the indicated unit prices:

Item	Description	Unit	Estimated	<b>Bid Unit Price</b>	<b>Bid Amount</b>
No.			Quantity		
					\$
					\$
					\$
					\$
					\$
Total of	f All Unit Price Bid Items				\$

- 2. Bidder acknowledges that:
  - 1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
  - 2. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.
- 3.3 Total Bid Price (Lump Sum and Unit Prices)

Total Bid Price (Total of all Lump Sum and Unit Price Bids)	\$
---	----

### **ARTICLE 4—TIME OF COMPLETION**

- 4.1 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 4.2 Bidder agrees that the Work will be substantially complete on or before [Bidder inserts date], and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before [Bidder inserts date].
- 4.3 Bidder agrees that the Work will be substantially complete within [Bidder inserts number] calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within [Bidder inserts number] calendar days after the date when the Contract Times commence to run.
- 4.4 Bidder accepts the provisions of the Agreement as to liquidated damages.

# ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

- 5.1 Bid Acceptance Period
  - 1. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

### 5.2 *Instructions to Bidders*

1. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

### 5.3 *Receipt of Addenda*

1. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

### ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

### 6.1 *Bidder's Representations*

- 1. In submitting this Bid, Bidder represents the following:
  - 1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
  - 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
  - 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
  - 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
  - 6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
  - 7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
  - 8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
  - 9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies

between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

- 10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- 11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- 6.2 Bidder's Certifications
  - 1. The Bidder certifies the following:
    - 1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
    - 2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
    - 3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
    - 4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract:
      - 1. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
      - 2. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
      - 3. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
      - 4. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

	(typed or printed name of organization)
By:	
-	(individual's signature)
Name:	(typed or printed)
Title:	(typed of primed)
	(typed or printed)
Date:	
If Ridder i	(typed or printed)
ij Diader is	a corporation, a partnersnip, or a joint venture, attach evidence of authority to sign.
Attest:	
Nama	(individual's signature)
Inallie.	(typed or printed)
Title:	
	(typed or printed)
Date:	(typed or printed)
Address f	or giving notices:
Bidder's (	Contact:
Name:	(and I can which I)
Title	(typea or printea)
THE.	(typed or printed)
Phone:	
Email:	
Address:	

# SECTION 00 41 20 - BIDDER QUALIFICATION REQUIREMENTS

# PART 1 - GENERAL

### 1.1 SUMMARY

- A. The Owner intends to award the Contract for the Work described by the Contract Documents to a sufficiently experienced, responsible, financially capable and qualified Bidder in consideration of all factors judged to be in the best interest of the Owner.
- B. To be considered for Award, Bidders must complete and submit a fully complete and accurate Bidder Qualifications Statement along with the Bid using the form attached to this Specification (Exhibit A).
- C. Minimum bidder qualifications requirements are specified herein.
- D. The Owner and Engineer will evaluate the submitted Bidder Qualifications Statement using their best judgment, as well as other information as may be discovered by the Owner or Engineer pertaining to the Bidder's qualifications to determine if Bidder meets the minimum qualifications requirements.

### 1.2 BIDDER ACKNOWLEDGEMENT

- A. In the event a Bidder challenges the Award decision made by the Owner, or any recommendation make the Engineer, and the Owner's decision is upheld upon review by an appropriate review agency or court, the protesting firm shall be liable for all costs and expenses incurred by the Owner and Engineer, including attorney's fees, as well as the costs and expenses associated with any delay in Contract Award. Furthermore, Owner or Engineer will not be liable to Bidder for costs or damages of any kind, including consequential damages related to Engineer's recommendation or Owner's decisions regarding Bidder Qualifications. The place of venue for any challenge of the qualification and Bid process and decisions shall be Teller County, Colorado.
- B. Bidder's submission of a Bid for this Contract shall indicate Bidder's acceptance of the foregoing provision.

### 1.3 MINIMUM QUALIFICATIONS

A. To be considered Qualified, Bidder must submit satisfactory responses to all items included on Exhibits A and B.

- B. General requirements:
  - 1. Construction experience with demonstrated excellence and quality in the construction of similar water distribution and treatment projects.
  - 2. Respondent and sub-contractor(s) companies are headquartered or have a significant regional business office located in the State of Colorado and are registered to conduct business in the State of Colorado.
- C. Specifically, in addition to the general requirements noted above, the following minimum Bidder qualification requirements are required to be considered for Contract Award:
  - a. Experience successfully constructing at least two (2) similar potable water distribution and water treatment projects within the last seven (7) years.
  - b. The determination of what constitutes a "similar" project will be at the sole discretion of the Engineer based on their professional judgment. In general, the term "similar" as used above describes installation of meter pits and potable water meters.
  - c. The term "successful" as used above refers to completion or significant progress of at least 85% towards completion of a project in accordance with the project's Contract Documents, with quality work, in a timely fashion and without excessive and unjustified claims and or Change Orders. References and opinions of the owner and engineer for reference projects, or any project completed or currently in progress by Bidder will also be considered when determining if the project was "successfully" completed or in the process of being "successfully" completed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

### END OF SECTION

SECTION 00 41 20 - EXHIBIT A: BIDDER QUALIFICATION STATEMENT

The undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

SUBMITTED TO:	Arabian Acres Metropolitan District
SUBMITTED BY:	
CHECK ONE:	Corporation Partnership
	Joint Venture Other

- 1. How many years has your organization been in business as a General Contractor?
- 2. How many years has your organization been in business under its present business name?
- 3. If a Corporation, answer the following:

a.	Date of Incorporation	
b.	State of Incorporation	
c.	President	
d.	Vice President(s)	
e.	Secretary	

|--|

		f.	Treasurer
4.	If a Pa	rtne	ership, answer the following:
		a.	Date of Organization
		h	Type of Partnership
		U.	
		c.	Name and Address of all partners:
5.	If other	r th	an a Corporation or Partnership, describe the organization and name principals:
6.	What p	oerc	ent of work do you normally perform with your own forces:
	List tra	ides	:

7. Have you ever failed to complete any work awarded to you? If so, indicated when, where and why.

8. Has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a construction contract?

If so, what were the circumstances?

9. List major construction projects your organization has under contract on this date:

Project			Contract	Contract	Percent	Scheduled	
Name	Owner	A/E	Amount	Date	Complete	Completion	

10. List major construction projects your organization has completed in the past 5 years:

Proje	ct		Contract	Date	Date	% of Own
Nam	e Owner	A/E	Amount	Awarded	Completed	Forces

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

	Individual's Name	Construction Experience (years)	Present Position & Years Experience	Dollar Volume Responsibility	Previous Position & Years Experience
12.	List states and ca	tegories in which you	r organization is leg	gally qualified to c	do business:
13.	Bank references,	including contact nam	e and phone numb	er:	

11. List the construction experience of the principal individuals in your organization:

Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

14. Trade references, including contract name and phone number:

15. Name of bonding and insurance companies, and name and address of agents:

Name of Company	Name of Agent	Address of Agent	Maximum Bonding Capacity

16. The undersigned agrees to furnish, upon request by the Owner, within 48 hours after bid proposal opening, a current Statement of Financial Conditions, including the Contractor's latest regular dated financial statement of balance sheet which must contain the following items:

Current assets:	Cash, joint venture accounts, accounts receivable, notes
	receivable, accrued interest on notes, deposits, and materials,
	and prepaid expenses, next fixed assets and other assets.

Current liabilities: Accounts payable, notes payable, accrued interest on notes, provision for income taxes, advances received from owners, accrued salaries, accrued payroll taxes, other liabilities, and

1.

capital (capital stock, authorized and outstanding shares par values, earned surplus).

	Date of statement of balance sl	neet:			
	Name of firm preparing statem	ent:			
	By (Agent and Capacity):				
17	. Dated at			 	, this
			day of		
	(Day)			(Year)	
	Name of Organization:				
	Ву:			 	
	Title:				

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

8. <u>NOTARIZATION:</u>		
State of:		
County of:		
	being duly sworn	deposes and say that (he/she) is the
	of	Contractor(s)
and that the answers on attachments herei Subscribed and swor	in contained are true and rn before me this	ons and all statements and information contain l correct.
	day of	
(Day)		(Year)
Notary Public:		
My commission exp	ires:	

# SIMILAR PROJECT REFERENCE FORM

Submit two (2) qualification statements.

Project No:	
Project Name and Location:	
Bid Amount:	
Final Contract Amount:	Year Completed:
Contract Completion Time:	Days
Dollar Amount and Number of O	Change Orders:
Actual Completion Time:	Days
Description of Work:	
General Overview:	
Other Information? (attach a	s needed)
Names Key Contractor Personne	el:
Project Manager	
Project Engineer	
Superintendent	
Are all of these persons still	employed by your organization
If no, name those employe	e(s) not currently employed
Name and phone number of curr with this Project.	rently employed individual at your organization who is familiar
Name, Address, and Telephone 2 contact person):	Number of <b>Owner</b> (including name and telephone number of

Name, Address, and Telephone Number of **Engineer** (including name and telephone number of contact person):

Name, Address, and Telephone Number of Construction Manager employed by Owner

Amount and number of claims resulting in arbitration or litigation:

Amount of Settlement:

Further Information of Claims:

# [REPEAT FOR OTHER PROJECT(S)]

# SECTION 00 41 10 - EXHIBIT B: CERTIFICATION OF BIDDER'S EXPERIENCE AND QUALIFICATIONS

The undersigned bidder certifies that he is, and shall be, throughout the period of the contract, licensed by the State of Colorado to do the type of work required under terms of the contract documents. Bidder further certifies that he is skilled and regularly engaged in the general class and type of work called for in the contract documents. The bidder warrants that he is competent, knowledgeable and has special skills on the nature, extent and inherent conditions of the work to be performed.

Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the particular facilities which may create, during the construction program, unusual or peculiar unsafe conditions hazardous to persons and property. Bidder expressly acknowledges that he is aware of such peculiar risks and that he has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the construction work with respect to such hazards.

Signed this \_\_\_\_\_\_, 20\_\_\_.

Name of Bidder

Signature of Bidder

Title of Signator

# END OF SECTION

### SECTION 00 52 15 - AGREEMENT FORM

# AGREEMENT

# BETWEEN OWNER AND CONTRACTOR

# FOR CONSTRUCTION CONTRACT

This Agreement is by and between Arabian Acres Metropolitan District ("Owner") and

### Name of Contractor ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

### **ARTICLE 1—WORK**

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: [Brief description of Work]

### **ARTICLE 2—THE PROJECT**

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: [Brief description of Project]

### **ARTICLE 3—ENGINEER**

- 3.01 The Owner has retained AquaWorks DBO, Inc. ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.
- 3.02 The part of the Project that pertains to the Work has been designed by Engineer.

### **ARTICLE 4—CONTRACT TIMES**

4.01 *Time is of the Essence* 

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Dates* 

A. The Work will be substantially complete on or before **[date]**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **[date]**.

4.03 *Contract Times: Days* 

A. The Work will be substantially complete within **[number]** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions,

and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **[number]** days after the date when the Contract Times commence to run.

#### 4.05 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner \$400 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$200 for each day that expires after such time until the Work is completed and ready for final payment.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

### ARTICLE 5—CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:
  - A. For all Work other than Unit Price Work, a lump sum of **\$[number]**.

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

	Unit Price Work					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price	
				\$	\$	
				\$	\$	
				\$	\$	
				\$	\$	
				\$	\$	

Unit Price Work					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
Total adjust	Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)\$				

- C. The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.
- D. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) \$[number].

### **ARTICLE 6—PAYMENT PROCEDURES**

- 6.01 Submittal and Processing of Payments
  - A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.
- 6.02 *Progress Payments; Retainage* 
  - A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the 1<sup>st</sup> day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
    - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
      - a. 95 percent of the value of the Work completed (with the balance being retainage).
      - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
  - B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.
- 6.03 Final Payment
  - A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

- 6.04 *Consent of Surety* 
  - A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

#### 6.05 Interest

A. All amounts not paid when due will bear interest at the rate of 6 percent per annum.

### **ARTICLE 7—CONTRACT DOCUMENTS**

#### 7.01 Contents

- A. The Contract Documents consist of all of the following:
  - 1. This Agreement.
  - 2. Bonds:
    - a. Performance bond (together with power of attorney).
    - b. Payment bond (together with power of attorney).
  - 3. General Conditions.
  - 4. Supplementary Conditions.
  - 5. Specifications as listed in the table of contents of the project manual (copy of list attached).
  - 6. Drawings listed on the attached sheet index.
  - 7. Addenda (numbers 1 to **x**, inclusive).
  - 8. Exhibits to this Agreement (enumerated as follows):
    - a. Certificates of Insurance
  - 9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    - a. Notice to Proceed.
    - b. Work Change Directives.
    - c. Change Orders.
    - d. Field Orders.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

#### **ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS**

- 8.01 *Contractor's Representations* 
  - A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

- 1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
- 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
- 4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
- 5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
- 6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
- 7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- 8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- 9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- 10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- 11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

### 8.02 Contractor's Certifications

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

- 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
- "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
- 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
- 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

### 8.03 Standard General Conditions

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agr	eement will be effective on	(which is the Effective Date of the Contract).		
Owner:		Contractor:		
Arabian	Acres Metropolitan District			
(	typed or printed name of organization)	(typed or printed name of organization)		
By:		By:		
	(individual's signature)	(individual's signature)		
Date:		Date:		
	(date signed)	(date signed)		
Name:	Edith Coffman	Name:		
	(typed or printed)	(typed or printed)		
Title:	Board President	Title:		
•	(typed or printed)	(typed or printed) (If <b>[Type of Entity]</b> is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)		
Attest:	(:	Attest:		
Titler	(inalviaual's signature)	(inatviauai s signature)		
The:	(typed or printed)	(typed or printed)		
Address	for giving notices:	Address for giving notices:		
c/o Wal	ker Schooler District Managers			
614 N. 7	Tejon St			
Colorad	o Springs, CO 80903			
Designa	ted Representative:	Designated Representative:		
Name:		Name:		
	(typed or printed)	(typed or printed)		
Title:		Title:		
	(typed or printed)	(typed or printed)		
Address	S:	Address:		
c/o Wal	ker Schooler District Managers			
614 N. 7	Tejon St			
Colorad	o Springs, CO 80903			
Phone:	(719) 447-1777	Phone:		
Email:	edith@aametro.net	Email:		
(If [Type	of Entity] is a corporation, attach evidence of	License No.:		
authority	to sign. If [ <b>Type of Entity</b> ] is a public body,	(where applicable)		
other doci	uments authorizing execution of this	State:		

END OF DOCUMENT

# SECTION 00 52 16 - PERFORMANCE BOND

Contractor	Surety
Name:	Name:
Address (principal place of business):	Address (principal place of business):
Owner	Contract
Name: Arabian Acres Metropolitan District	Description (name and location):
Mailing address (principal place of business):	Arabian Acres Metropolitan District
c/o Walker Schooler District Managers	Distribution and Treatment Improvement Project
614 N. Tejon St	
Colorado Springs, CO 80903	Contract Price:
	Effective Date of Contract:
Bond	
Bond Amount:	
Date of Bond:	
(Date of Bond cannot be earlier than Effective Date of Contract)	
Modifications to this Bond form:	
□ None □ See Paragraph 16	d handhar and is at the termine and family in this
Performance Bond do each cause this Performance	Bond to be duly executed by an authorized officer
agent, or representative.	bond to be duly excedice by an admonized officer,
Contractor as Principal	Surety
	-
(Full formal name of Contractor)	(Full formal name of Surety) (corporate seal)
By:	Ву:
(Signature)	(Signature)(Attach Power of Attorney)
Name:	Name:
(Printed or typed)	(Printed or typed)
Attest	Attest
(Signature)	(Signature)
Name:	
	Name:
(Printed or typed)	Name:(Printed or typed)
(Printed or typed) Title:	Name: (Printed or typed) Title:

- 1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
- 2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
- 3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
  - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
  - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
  - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
- 4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
- 5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
  - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
  - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
  - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
  - 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
    - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

- 6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
- 7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
  - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
  - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
  - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
- 8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
- 9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
- 10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- 11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.
- 12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
- 13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
- 14. Definitions
  - 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

- 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
- 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
- 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
- 15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
- 16. Modifications to this Bond are as follows: None.

### END OF SECTION

Contractor	Surety
Name:	Name:
Address (principal place of business):	Address (principal place of business):
Owner	Contract
Name: Arabian Acres Metropolitan District	Description (name and location):
Mailing address (principal place of business):	Arabian Acres Metropolitan District
c/o Walker Schooler District Managers	Distribution and Treatment Improvement Project
614 N. Tejon St	
Colorado Springs, CO 80903	Contract Price:
	Effective Date of Contract:
Bond	
Bond Amount:	
Date of Bond:	
(Date of Bond cannot be earlier than Effective Date of Contract)	
Modifications to this Bond form:	
$\square$ None $\square$ See Paragraph 18	
Surety and Contractor, intending to be legally boun	d hereby, subject to the terms set forth in this Payment
Bond, do each cause this Payment Bond to be duly	executed by an authorized officer, agent, or
representative.	
Contractor as Principal	Surety
(Full formal name of Contractor)	(Full formal name of Surety) (corporate seal)
Ву:	Ву:
(Signature)	(Signature)(Attach Power of Attorney)
Name:	Name:
(Printed or typed)	(Printed or typed)
Title:	Title:
Attest:	Attest:
(Signature)	(Signature)
Name:	Name:
(Printed or typed)	(Printed or typed)
Title:	Title:
Notes: (1) Provide supplemental execution by any additional p	arties, such as joint venturers. (2) Any singular reference to
Contractor, Surety, Owner, or other party is considered plural	where applicable.

### SECTION 00 52 17 - PAYMENT BOND

- 17. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
- 18. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
- 19. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
- 20. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
- 21. The Surety's obligations to a Claimant under this Bond will arise after the following:
  - 21.1. Claimants who do not have a direct contract with the Contractor
    - 121..1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
    - 121..2. have sent a Claim to the Surety (at the address described in Paragraph 13).
  - 21.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
- 22. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
- 23. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
  - 23.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
  - 23.2. Pay or arrange for payment of any undisputed amounts.
  - 23.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

- 24. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
- 25. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
- 26. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
- 27. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- 28. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
- 29. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
- 30. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
- 31. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
- 32. Definitions
  - 32.1. *Claim*—A written statement by the Claimant including at a minimum:
    - 132..1. The name of the Claimant;
    - 132..2. The name of the person for whom the labor was done, or materials or equipment furnished;
    - 132..3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
    - 132..4. A brief description of the labor, materials, or equipment furnished;
    - 132..5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

- 132..6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
- 132..7. The total amount of previous payments received by the Claimant; and
- 132..8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 32.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 32.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 32.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 32.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
- 33. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
- 34. Modifications to this Bond are as follows: None.

END OF SECTION

	Surety
Name:	Name:
Address (principal place of business):	Address (principal place of business):
Owner	Bid
Name: Arabian Acres Metropolitan District	Project (name and location):
Address (principal place of business):	Arabian Acres Metropolitan District
c/o Walker Schooler District Managers	Distribution and Treatment Improvement
614 N. Tejon St	
Colorado Springs, CO 80903	Rid Due Date:
Dond	Bid Due Date.
Penal Sum:	
Date of Bond:	
Surety and Bidder, intending to be legally bound do each cause this Bid Bond to be duly executed l	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative.
Surety and Bidder, intending to be legally bound do each cause this Bid Bond to be duly executed l Bidder	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety
Surety and Bidder, intending to be legally bound do each cause this Bid Bond to be duly executed l Bidder	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety
Surety and Bidder, intending to be legally bound do each cause this Bid Bond to be duly executed l Bidder (Full formal name of Bidder)	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal)
Surety and Bidder, intending to be legally bound do each cause this Bid Bond to be duly executed be Bidder (Full formal name of Bidder) By:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By:
Surety and Bidder, intending to be legally bound a do each cause this Bid Bond to be duly executed b Bidder  (Full formal name of Bidder) By: (Signature)	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney)
Surety and Bidder, intending to be legally bound a do each cause this Bid Bond to be duly executed a Bidder  (Full formal name of Bidder) By: (Signature) Name: (Printed or typed)	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed)
Surety and Bidder, intending to be legally bound is do each cause this Bid Bond to be duly executed is Bidder  (Full formal name of Bidder) By: (Signature) Name: (Printed or typed) Title:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title:
Surety and Bidder, intending to be legally bound is do each cause this Bid Bond to be duly executed is Bidder          (Full formal name of Bidder)         By:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title:
Surety and Bidder, intending to be legally bound in do each cause this Bid Bond to be duly executed in Bidder         Bidder         (Full formal name of Bidder)         By:         (Signature)         Name:         (Printed or typed)         Title:         Attest:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title: Attest:
Surety and Bidder, intending to be legally bound is do each cause this Bid Bond to be duly executed is Bidder          Bidder         (Full formal name of Bidder)         By:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title: Attest: (Signature)
Surety and Bidder, intending to be legally bound in do each cause this Bid Bond to be duly executed in Bidder         Bidder         (Full formal name of Bidder)         By:         (Signature)         Name:         (Printed or typed)         Title:         (Signature)         Name:         (Signature)         Name:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title: Attest: (Signature) Name: (Dist the top 1)
Surety and Bidder, intending to be legally bound is do each cause this Bid Bond to be duly executed is Bidder          Bidder         (Full formal name of Bidder)         By:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title: Attest: (Signature) Name: (Printed or typed) Title:
Surety and Bidder, intending to be legally bound is do each cause this Bid Bond to be duly executed is Bidder          Bidder         (Full formal name of Bidder)         By:         (Signature)         Name:         (Printed or typed)         Title:         (Signature)         Name:         (Printed or typed)         Title:	hereby, subject to the terms set forth in this Bid Bond, by an authorized officer, agent, or representative. Surety (Full formal name of Surety) (corporate seal) By: (Signature) (Attach Power of Attorney) Name: (Printed or typed) Title: Attest: (Signature) Name: (Printed or typed) Title: (Printed or typed) Title:

# SECTION 00 52 18 - BID BOND

- 35. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
- 36. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
- 37. This obligation will be null and void if:
  - 37.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 37.2. All Bids are rejected by Owner, or
  - 37.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
- 38. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
- 39. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
- 40. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
- 41. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
- 42. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
- 43. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
- 44. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
- 45. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

END OF SECTION
# SECTION 00 72 15 - GENERAL CONDITIONS

## ARTICLE 1—DEFINITIONS AND TERMINOLOGY

### 1.01 Defined Terms

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

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

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

- 10. *Claim*
- a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal;

seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
- c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
- d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. Cost of the Work—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract.

Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. Engineer—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

- a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
- b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
- c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

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

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

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

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) 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 of such Work.

43. Successful Bidder—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

- 46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
- b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
- c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. Underground Facilities—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. Intent of Certain Terms or Adjectives: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the 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 is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

- 1. does not conform to the Contract Documents;
- 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
- 3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. Furnish, Install, Perform, Provide
- 1. The word "furnish," when used in connection with services, materials, or equipment, means 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, means 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, means to furnish and install said services, materials, or equipment complete and ready for intended use.
- 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Contract Price or Contract Times: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to

(1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

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

## ARTICLE 2—PRELIMINARY MATTERS

- 2.01 Delivery of Performance and Payment Bonds; Evidence of Insurance
  - A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
  - B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
  - C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.
- 2.02 Copies of Documents
  - A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
  - B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.
- 2.03 Before Starting Construction
  - A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
    - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
    - 2. a preliminary Schedule of Submittals; and
    - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides 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.

- 2.04 Preconstruction Conference; Designation of Authorized Representatives
  - A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as a.
  - B. ppropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
  - C. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.
- 2.05 Acceptance of Schedules
  - A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
    - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
    - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
    - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
    - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

## 2.06 Electronic Transmittals

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

## **ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

## 3.01 Intent

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- 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.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
  - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
  - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

## 3.02 Reference Standards

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

- 3.03 Reporting and Resolving Discrepancies
  - A. *Reporting Discrepancies* 
    - 1. Contractor's Verification of Figures and Field Measurements: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
    - 2. Contractor's Review of Contract Documents: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
    - 3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.
  - B. *Resolving Discrepancies* 
    - 1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
      - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
      - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).
- 3.04 Requirements of the Contract Documents
  - A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.
  - B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding

on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.
- 3.05 Reuse of Documents
  - A. Contractor and its Subcontractors and Suppliers shall not:
    - 1. 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 Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
    - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
  - B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK**

- 4.01 Commencement of Contract Times; Notice to Proceed
  - A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.
- 4.02 Starting the Work
  - A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.
- 4.03 Reference Points
  - A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer'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 Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in

grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

- 4.04 Progress Schedule
  - A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
    - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
    - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
  - B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.
- 4.05 Delays in Contractor's Progress
  - A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
  - B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
  - C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
    - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
    - 2. Abnormal weather conditions;
    - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
    - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
  - 1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
  - 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
  - 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
  - 1. The circumstances that form the basis for the requested adjustment;
  - 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
  - 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
  - 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
  - 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

# ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

- 5.01 Availability of Lands
  - A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
  - B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to

be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.
- 5.02 Use of Site and Other Areas
  - A. Limitation on Use of Site and Other Areas
    - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
    - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against 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) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
  - B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
  - C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures*: 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 structures or land to stresses or pressures that will endanger them.
- 5.03 Subsurface and Physical Conditions
  - A. *Reports and Drawings*: The Supplementary Conditions identify:
    - 1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
    - 2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
    - 3. Technical Data contained in such reports and drawings.
  - B. Underground Facilities: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
  - C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.
  - D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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;
    - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
    - 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
    - 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.
- 5.04 Differing Subsurface or Physical Conditions
  - A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
    - 1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
    - 2. is of such a nature as to require a change in the Drawings or Specifications;

- 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. Owner's Statement to Contractor Regarding Site Condition: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. Possible Price and Times Adjustments
  - 1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. 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 Paragraph 13.03; and,
    - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
  - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
- 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
- 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. Underground Facilities; Hazardous Environmental Conditions: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.
- 5.05 Underground Facilities
  - A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
    - 1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - 2. complying with applicable state and local utility damage prevention Laws and Regulations;
    - 3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
    - 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
  - B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then 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 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

- C. Engineer's Review: Engineer will:
  - 1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
  - 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
  - 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
  - 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. Owner's Statement to Contractor Regarding Underground Facility: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. Possible Price and Times Adjustments
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. 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 Paragraph 13.03;
    - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
    - c. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

- 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
- 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.
- 5.06 Hazardous Environmental Conditions at Site
  - A. *Reports and Drawings*: The Supplementary Conditions identify:
    - 1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
    - 2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
    - 3. Technical Data contained in such reports and drawings.
  - B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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;
    - 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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
  - D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then 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 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (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.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors 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, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors 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 relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 6—BONDS AND INSURANCE

- 6.01 Performance, Payment, and Other Bonds
  - A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
  - B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
  - C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
  - D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
  - E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
  - F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.
- 6.02 Insurance—General Provisions
  - A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
  - B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
  - C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
  - D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
  - E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
  - F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
  - G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if

any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

- H. Contractor shall require:
  - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
  - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.
- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.
- 6.03 Contractor's Insurance
  - A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
  - B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:
    - 1. include at least the specific coverages required;

- 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
- 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
- 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
- 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
  - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
  - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
  - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
  - 4. not seek contribution from insurance maintained by the additional insured; and
  - 5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.
- 6.04 Builder's Risk and Other Property Insurance
  - A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
  - B. Property Insurance for Facilities of Owner Where Work Will Occur: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
  - C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance

at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. Insurance of Other Property; Additional Insurance: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.
- 6.05 Property Losses; Subrogation
  - A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
    - 1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
    - 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
  - B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

- 1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.
- 6.06 Receipt and Application of Property Insurance Proceeds
  - A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
  - B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
  - C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

# ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

- 7.01 Contractor's Means and Methods of Construction
  - A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
  - B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

- 7.02 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.
  - B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.
- 7.03 Labor; Working Hours
  - A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.
  - B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
  - C. 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 stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.
- 7.04 Services, Materials, and Equipment
  - A. Unless otherwise specified in the Contract Documents, Contractor shall provide 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 performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
  - B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
  - C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.
- 7.05 "Or Equals"
  - A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor

may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

- 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
  - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
    - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
    - 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
    - 3) has a proven record of performance and availability of responsive service; and
    - 4) is not objectionable to Owner.
  - b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
    - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
    - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.
- 7.06 Substitutes
  - A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

- 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
- 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
- 3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
  - a. will certify that the proposed substitute item will:
    - 1) perform adequately the functions and achieve the results called for by the general design;
    - 2) be similar in substance to the item specified; and
    - 3) be suited to the same use as the item specified.
  - b. will state:
    - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
    - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
    - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
  - c. will identify:
    - 1) all variations of the proposed substitute item from the item specified; and
    - 2) available engineering, sales, maintenance, repair, and replacement services.
  - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.
- 7.07 Concerning Subcontractors and Suppliers
  - A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
  - B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
  - C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
  - D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
  - E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
  - F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.
- 7.08 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 in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an 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 Owner or Engineer, 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 will be disclosed in the Contract Documents.
  - B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, 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 relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
  - C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors 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 relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

## 7.09 Permits

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

## 7.10 Taxes

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

## 7.11 Laws and Regulations

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors 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 relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

## 7.12 Record Documents

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

### 7.13 Safety and Protection

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. 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, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with

Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.
- 7.14 Hazard Communication Programs
  - A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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.
- 7.15 Emergencies
  - A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

### 7.16 Submittals

- A. A. Shop Drawing and Sample Requirements
  - 1. Before submitting a Shop Drawing or Sample, Contractor shall:
    - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
    - b. determine and verify:
      - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
      - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
      - all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
    - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
  - 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.
  - 3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the

Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

- B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
  - 1. Shop Drawings
    - a. Contractor shall submit the number of copies required in the Specifications.
    - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
  - 2. Samples
    - a. Contractor shall submit the number of Samples required in the Specifications.
    - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
  - 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. Engineer's Review of Shop Drawings and Samples
  - 1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of 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. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
  - 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
  - 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.
  - 5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

- 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
- 7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
- 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.
- D. Resubmittal Procedures for Shop Drawings and Samples
  - 1. Contractor shall make corrections required by Engineer 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 Engineer on previous Submittals.
  - 2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
  - 3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.
- E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs
  - 1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
    - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
    - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
    - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.
    - d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
  - 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.
- 7.17 Contractor's General Warranty and Guarantee
  - A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
  - B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
    - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
    - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
  - C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
    - 1. abuse, or improper modification, 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.
  - D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
    - 1. Observations by Engineer;
    - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
    - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
    - 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;
    - 6. The issuance of a notice of acceptability by Engineer;
    - 7. The end of the correction period established in Paragraph 15.08;
    - 8. Any inspection, test, or approval by others; or
    - 9. Any correction of defective Work by Owner.
  - E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

### 7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will 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 individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- 7.19 Delegation of Professional Design Services
  - A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
  - B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
  - C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.
  - D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
  - 1. Checking for conformance with the requirements of this Paragraph 7.19;
  - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
  - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

## **ARTICLE 8—OTHER WORK AT THE SITE**

- 8.01 Other Work
  - A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have thirdparty utility owners perform work on their utilities and facilities at or adjacent to the Site.
  - B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
  - C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
  - D. 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 such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
  - E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
  - F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having

been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

#### 8.02 Coordination

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.
- 8.03 Legal Relationships
  - A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
  - B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
    - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
    - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's

failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against 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) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9—OWNER'S RESPONSIBILITIES**

- 9.01 Communications to Contractor
  - A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.
- 9.02 Replacement of Engineer
  - A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.
- 9.03 Furnish Data
  - A. Owner shall promptly furnish the data required of Owner under the Contract Documents.
- 9.04 Pay When Due
  - A. Owner shall make payments to Contractor when they are due as provided in the Agreement.
- 9.05 Lands and Easements; Reports, Tests, and Drawings
  - A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
  - B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
  - C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 Insurance
  - A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

- 9.07 Change Orders
  - A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 Inspections, Tests, and Approvals
  - A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 Limitations on Owner's Responsibilities
  - A. The Owner 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 and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 Undisclosed Hazardous Environmental Condition
  - A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 Evidence of Financial Arrangements
  - A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).
- 9.12 Safety Programs
  - A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
  - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

#### ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

- 10.01 Owner's Representative
  - A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.
- 10.02 Visits to Site
  - A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, 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, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer 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 and Regulations applicable to the performance of the Work.
- 10.03 Resident Project Representative
  - A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
  - B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.
- 10.04 Engineer's Authority
  - A. Engineer has the authority to reject Work in accordance with Article 14.
  - B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
  - C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
  - D. Engineer's authority as to changes in the Work is set forth in Article 11.
  - E. Engineer's authority as to Applications for Payment is set forth in Article 15.
- 10.05 Determinations for Unit Price Work
  - A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.
- 10.06 Decisions on Requirements of Contract Documents and Acceptability of Work
  - A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.
- 10.07 Limitations on Engineer's Authority and Responsibilities
  - A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer 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 Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer 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 and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, 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 10.07 also apply to the Resident Project Representative, if any.
- 10.08 Compliance with Safety Program
  - A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

## ARTICLE 11—CHANGES TO THE CONTRACT

- 11.01 Amending and Supplementing the Contract
  - A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
  - C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.
- 11.02 Change Orders
  - A. Owner and Contractor shall execute appropriate Change Orders covering:
    - 1. Changes in Contract Price or Contract Times 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;
    - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
    - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the

design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

- 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.
- 11.03 Work Change Directives
  - A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.
  - B. If Owner has issued a Work Change Directive and:
    - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
    - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

#### 11.04 Field Orders

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.
- 11.05 Owner-Authorized Changes in the Work
  - A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
  - B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed

with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.
- 11.06 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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.
- 11.07 Change of Contract Price
  - A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
  - B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
    - 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
    - 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
  - C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will 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 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
      - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
      - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable

to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

- d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
- e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
- f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.
- 11.08 Change of Contract Times
  - A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
  - B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.
- 11.09 Change Proposals
  - A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.
  - B. Change Proposal Procedures
    - 1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
    - 2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
      - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

- 3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. Engineer's Full Review and Action on the Change Proposal: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
- 5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.
- 11.10 Notification to Surety
  - A. If the provisions of any bond require notice to be given to a surety 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), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

## ARTICLE 12—CLAIMS

- 12.01 Claims
  - A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
    - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

- 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
- 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
- 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. Mediation
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the conclusion of the mediation, as determined by the mediator.
  - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

- 13.01 Cost of the Work
  - A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
    - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
    - 2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
  - B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
    - 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
    - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
    - 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine,

with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

- 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
- 5. Other costs consisting of 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, 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.
    - 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.
  - c. Construction Equipment Rental
    - Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
    - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
    - 3) 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and 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.
- 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 of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. Costs Excluded: The term Cost of the Work does not include any of the following items:
  - 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
  - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
  - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
  - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
  - 5. 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.
  - 6. Expenses incurred in preparing and advancing Claims.
  - 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

### D. Contractor's Fee

- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
  - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
  - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
    - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
    - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
- 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.
- E. Documentation and Audit: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.
- 13.02 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 performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
  - B. Cash Allowances: Contractor agrees that:
    - 1. the cash 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, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
  - C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
  - D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

#### 13.03 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 unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. 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. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. 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.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.
- E. Adjustments in Unit Price
  - 1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
    - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
    - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
  - 2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
  - 3. Adjusted unit prices will apply to all units of that item.

## ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

- 14.01 Access to Work
  - A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

- 14.02 Tests, Inspections, and Approvals
  - A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
  - B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
  - C. If Laws or Regulations of any public body 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 Engineer the required certificates of inspection or approval.
  - D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
    - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
    - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
    - 3. by manufacturers of equipment furnished under the Contract Documents;
    - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
    - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.
- 14.03 Defective Work
  - A. Contractor's Obligation: It is Contractor's obligation to assure that the Work is not defective.
  - B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.
  - C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 Acceptance of Defective Work

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.
- 14.05 Uncovering Work
  - A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
  - B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
  - C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
    - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to 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 pending

Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

- 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.
- 14.06 Owner 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 perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.
- 14.07 Owner May Correct Defective Work
  - A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
  - B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner 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, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
  - A. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, 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, or replacement of Contractor's defective Work.
  - B. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

- 15.01 Progress Payments
  - A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of

Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

- B. Applications for Payments
  - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer 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.
  - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  - 3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  - 4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. Review of Applications
  - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer'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, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
    - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

- 3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
  - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
- 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
  - a. to supervise, direct, or control the Work;
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
- 5. 5Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
- 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
  - a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
  - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.
- D. Payment Becomes Due
  - 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

#### E. Reductions in Payment by Owner

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. The Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. The Contract Price has been reduced by Change Orders;
  - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
  - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
  - 1. Other items entitle Owner to a set-off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
- 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

- 15.02 Contractor's Warranty of Title
  - A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.
- 15.03 Substantial Completion
  - A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
  - B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
  - C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
  - D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
  - E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
  - F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 Partial Use or Occupancy

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
  - 2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 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.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

#### 15.05 Final Inspection

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 Final Payment

- A. Application for Payment
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
  - 2. The final Application for Payment must be accompanied (except as previously delivered) by:
    - a. all documentation called for in the Contract Documents;
    - b. consent of the surety, if any, to final payment;

- c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
- d. a list of all duly pending Change Proposals and Claims; and
- e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. Engineer's Review of Final Application and Recommendation of Payment: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment 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 for Payment.
- C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.
- 15.07 Waiver of Claims
  - A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the

provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.
- 15.08 Correction Period
  - A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
    - 1. correct the defective repairs to the Site or such adjacent areas;
    - 2. correct such defective Work;
    - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
    - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
  - B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
  - C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. 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) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
  - D. 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.
  - E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
  - F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

- 16.01 Owner May Suspend Work
  - A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.
- 16.02 Owner May Terminate for Cause
  - A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
    - 1. Contractor's persistent failure 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);
    - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
    - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
    - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
  - B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
    - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
    - 2. enforce the rights available to Owner under any applicable performance bond.
  - C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
  - D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
  - E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by

Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.
- 16.03 Owner May Terminate for Convenience
  - A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
    - 1. 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. 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; and
    - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
  - B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.
- 16.04 Contractor May Stop Work or Terminate
  - A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
  - B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17—FINAL RESOLUTION OF DISPUTES**

- 17.01 Methods and Procedures
  - A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:
    - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
    - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
  - B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:
    - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
    - 2. agree with the other party to submit the dispute to another dispute resolution process; or
    - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## ARTICLE 18—MISCELLANEOUS

- 18.01 Giving Notice
  - A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
    - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
    - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
    - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.
- 18.02 Computation of Times
  - A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any 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.
- 18.03 Cumulative Remedies
  - A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto 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. 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.

- 18.04 Limitation of Damages
  - A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.
- 18.05 No Waiver
  - A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.
- 18.06 Survival of Obligations
  - A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.
- 18.07 Controlling Law
  - A. This Contract is to be governed by the law of the state in which the Project is located.
- 18.08 Assignment of Contract
  - A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.
- 18.09 Successors and Assigns
  - A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.
- 18.10 Headings
  - A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

#### END OF SECTION

### SECTION 00 73 14 - SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

## **ARTICLE 2 - PRELIMINARY MATTERS**

#### 2.02 *Copies of Documents*

- SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:
  - A. Owner shall furnish to Contractor one electronic copy of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement).
- 2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

- B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol ("EDP" or "Protocol") for exchange of electronic transmittals.
  - 1. Basic Requirements
    - a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.
    - b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.
    - c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.
    - d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

- e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.
- f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.
- 2. System Infrastructure for Electronic Document Exchange
  - a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.
    - 1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 10 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.
    - 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.
  - b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.
  - c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.
  - d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

- e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.
- f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.
- g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.
- h. The Contractor is encouraged to operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information.
- C. Software Requirements for Electronic Document Exchange; Limitations
  - 1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.
    - a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.
  - 2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.
  - 3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.
- SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:
  - D. Requests by Contractor for Electronic Documents in Other Formats
    - 1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

- 2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:
  - a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.
  - b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.
  - c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.
  - d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

# ARTICLE 5- SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

## 5.03 Subsurface and Physical Conditions

- SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:
  - E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:
| Report Title                        | Date of Report | Technical Data |
|-------------------------------------|----------------|----------------|
| Geotechnical Engineering Study      | 5/10/2019      | 4 boring logs  |
| Arabian Acres Metropolitan District |                |                |
| Proposed Water System Improvements  |                |                |
| Teller County, Colorado             |                |                |

- F. Contractor may examine copies of reports and drawings identified in SC-5.03.E that were not included with the Bidding Documents by requesting copies from Engineer.
- 5.06 Hazardous Environmental Conditions
- SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:
  - 4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
No Reports		

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
No Drawings		

# **ARTICLE 6-BONDS AND INSURANCE**

- 6.01 *Performance, Payment, and Other Bonds*
- SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:
  - 1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
  - 2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).
- 6.03 Contractor's Insurance
- SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:
  - D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: None.
  - E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not
	less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's	Statutory
responsibility coverage), if applicable	
Employer's Liability	
Each accident	\$1,000,000
Each employee	\$1,000,000
Policy limit	\$1,000,000

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
  - 1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
  - 2. damages insured by reasonably available personal injury liability coverage, and
  - 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
  - 1. Products and completed operations coverage.
    - a. Such insurance must be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  - 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  - 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
  - 4. Underground, explosion, and collapse coverage.
  - 5. Personal injury coverage.
  - 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

- 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
  - 1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
  - 2. Any exclusion for water intrusion or water damage.
  - 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
  - 4. Any exclusion of coverage relating to earth subsidence or movement.
  - 5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
  - 6. Any limitation or exclusion based on the nature of Contractor's work.
  - 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.
- I. Commercial General Liability—Minimum Policy Limits

Commercial General Liability	Policy limits of not
	less than:
General Aggregate	\$2,000,000
Products—Completed Operations Aggregate	\$2,000,000
Personal and Advertising Injury	\$1,000,000
Bodily Injury and Property Damage—Each Occurrence	\$300,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance 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. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$1,000,000

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$2,000,000
General Aggregate	\$2,000,000

- L. Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements: Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of \$1,500,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.
- M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	\$2,000,000
General Aggregate	\$2,000,000

N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	N/A
Annual Aggregate	N/A

# ARTICLE 7-CONTRACTOR'S RESPONSIBILITIES

- 7.03 *Labor; Working Hours*
- SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:
  - 1. Regular working hours will be 7:00 am to 6:00 pm.

- SC-7.03 Amend the first and second sentences of Paragraph 7.03.C to state "...all Work at the Site must be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday."
- 7.10 *Taxes*
- SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:
  - B. Owner is exempt from payment of sales and compensating use taxes of the State of Colorado and of cities and counties thereof on all materials to be incorporated into the Work.
    - 1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
    - 2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

# ARTICLE 10-ENGINEER'S STATUS DURING CONSTRUCTION

- SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:
  - C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
    - 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
    - 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
    - 3. Liaison
      - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
      - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
      - c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
    - 4. *Review of Work; Defective Work* 
      - a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
      - b. Observe whether any Work in place appears to be defective.

- c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
- 5. Inspections and Tests
  - a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
  - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
- 6. Payment Requests: Review Applications for Payment with Contractor.
- 7. *Completion* 
  - a. Participate in Engineer's visits regarding Substantial Completion.
  - b. Assist in the preparation of a punch list of items to be completed or corrected.
  - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
  - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:
  - 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
  - 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
  - 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
  - 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
  - 5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
  - 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
  - 7. Authorize Owner to occupy the Project in whole or in part.

# **ARTICLE 13-COST OF WORK; ALLOWANCES, UNIT PRICE WORK**

- 13.01 *Cost of the Work*
- SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:
  - a. For purposes of this paragraph, "small tools and hand tools" means any tool or equipment whose current price if it were purchased new at retail would be less than \$500.

# ARTICLE 15-PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

# 15.01 Progress Payments

SC-15.01D Amend the payment terms from 10 to 30 days.

# 15.03 Substantial Completion

- SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:
  - 1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or retesting, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

# END OF SECTION

# SECTION 00 95 00 – STATE REVOLVING FUND SPECIFICATIONS

#### **Colorado State Revolving Fund Required Specifications**

Section 1

#### **Davis Bacon Prevailing Wage Requirements**

This contract is governed by the Davis Bacon and related Acts and is subject to General Decision Number

\_\_\_\_\_dated\_\_\_\_CO\_\_\_\_. A copy of this General Decision Number is included as Exhibit\_\_\_\_\_of this document.

The SRF Program is subject to "Davis Bacon and Related Acts" or DBRA, which extends the requirements of the Davis-Bacon Act. Compliance with the Davis Bacon Act is required for any project funded by the Drinking Water Revolving Fund (DWRF) or Water Pollution Control Revolving Fund programs. Non-Compliance with the Davis Bacon Act may result in debarment and suspension from working on future projects funded with federal dollars for up to three years and/or loss of funding for the current project.

#### Preamble

With respect to the Clean Water and Safe Drinking Water State Revolving Funds, EPA provides capitalization grants to each State which in turn provides sub grants or loans to eligible entities within the State. Typically, the subrecipients are municipal or other local governmental entities that manage the funds. For these types of recipients, the provisions set forth under Roman numeral I, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section 3(ii)(A), below and for compliance as described in Section 1-5.

#### Attachment 1

Wage Rate Requirements under:

- The Consolidated Appropriations Act, 2016 (P.L 114-133), or
- The Water Resources Reform and Redevelopment Act of 2014 (WRRDA):

#### I. For Subrecipients that Are Governmental Entities:

The following terms and conditions specify how recipients will assist EPA in meeting its Davis - Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance under The 2014 Act with respect to State recipients and subrecipients that are governmental entities. If a subrecipient has questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient. If a State recipient needs guidance, the recipient may contact Breana Whittaker.breana@epa.gov\_or at 303-312-6463 of EPA, Region 8 for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at <a href="https://www.dol.gov/whd/">www.dol.gov/whd/</a>

1. Applicability of the Davis-Bacon (DB) prevailing wage requirements.

Under The Consolidate Appropriations Act, 2016, or The Water Resources Reform and Redevelopment Act of 2014, DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

2. Obtaining Wage Determinations.

- (a) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.
  - (1) While the solicitation remains open, the subrecipient shall monitor www.wdol.gov weekly to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.
  - (2) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor www.wdol.gov on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.
- (b) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.
- (c) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- (d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.
- 3. Contract and Subcontract provisions.
  - (a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or The 2014 Act, the following clauses:

Revised March 20, 2019

4

#### (1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, <u>www.dol.gov</u>

- (ii) (A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
  - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
  - (2) The classification is utilized in the area by the construction industry; and
  - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
  - (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently.

The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

- (C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- (2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
- (3) Payrolls and basic records.
  - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon

Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis- Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

- (ii) (A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week . The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls . Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at www.dol.gov/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).
  - (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
    - (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
    - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
    - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work

performed, as specified in the applicable wage determination incorporated into the contract.

- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.
- (4) Apprentices and trainees--
  - (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training , Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed . In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable

program is approved.

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U .S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR part 30.
- (5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
- (6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate , and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- (7) Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10)Certification of eligibility.

- (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U .S. Criminal Code, 18 U.S.C. 1001.
- 4. Contract Provision for Contracts in Excess of \$100,000.
  - (a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.
    - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
    - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.
    - (3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
    - (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor

shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

#### 5. Compliance Verification

- (a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.
- (b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicated that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.
- (c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of non compliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.
- (d) The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

(e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at: www.dol.gov/whd/index.htm

Revised March 20, 2019

12

#### Section 2

#### American Iron and Steel

The State Revolving Fund Program is subject to, and requires compliance with, the American Iron and Steel requirement. American Iron and Steel requires Water Pollution Control State Revolving Fund (WPCRF) and Drinking Water Revolving Fund (DWRF) assistance recipients use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed on or after January 17, 2014.

In providing bids, proposals, or services, the Contractor represents and warrants to and for the benefit of the borrower and the State that:

- a. The Contractor has reviewed and understands the American Iron and Steel requirement.
- b. All of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved.
- c. The Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the borrower or the State.

Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the borrower or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the borrower or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the borrower). While the Contractor has no direct contractual privity with the State, as a lender to the borrower for the funding of its project, the borrower and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of the Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

For purposes of the WPCRF and DWRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials

If the subrecipient can justify a claim made under one of the categories below, a waiver may be granted. Until a waiver is granted by the EPA, the AIS requirement must be adhered to as described in the act.

A waiver may be provided if EPA determines that:

- 1. Applying these requirements would be inconsistent with the public interest.
- 2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
- 3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

All waiver requests must be routed through the Grants and Loans unit project manager or compliance specialist.

EPA's guidance on AIS requirements, available at <a href="http://water.epa.gov/grants\_funding/aisrequirement.cfm">http://water.epa.gov/grants\_funding/aisrequirement.cfm</a>, includes specific instructions for communities interested in applying for a waiver. After receiving a completed application for a waiver from the grants and loans unit, EPA will publish the waiver request and all material submitted with the application on this website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to the EPA.

Approved National Waivers available for borrowers and contractors include:

• April 15, 2014 De Minimis Waiver:

"The EPA is hereby granting a nationwide waiver pursuant to the American Iron and Steel requirements of P.L. 113-76 CAA 2014 (Act), section 436 under the authority of Section 436(b)(1) (public interest waiver) for de minimis incidental components of eligible water infrastructure projects. This action permits the use of products when they occur in de minimis incidental components of such projects funded by the Act that may otherwise be prohibited under section 436(a). Funds used for such de minimis incidental components cumulatively may comprise no more than a total of 5 percent of the total cost of the material used in and incorporated into a project; the cost of an individual item may not exceed 1 percent of the total cost of materials used in and incorporated into a project."

For more information on approved waivers visit the following website: <a href="http://water.epa.gov/grants\_funding/aisrequirement.cfm">http://water.epa.gov/grants\_funding/aisrequirement.cfm</a>

#### Section 3

#### National Term on Suspension and Debarment

Under Executive Order 12549, an individual or organization debarred or excluded from participation in Federal assistance or benefit programs may not receive any assistance award under a Federal program, or a subagreement thereunder for \$25,000 or more.

The status of prospective individuals or organizations can be checked at <u>http://www.sam.gov</u>. It is the prime contractor's responsibility to verify that subcontractors, vendors, suppliers and manufacturers are not on the excluded parties list.

Revised March 20, 2019

15

#### Section 4

#### Disadvantaged Business Enterprise (DBE) - SRF Program Grant Agreement Information and Requirements

(NOTE: This section may not be required, please refer to your loan agreement or contact the grants and loans unit compliance specialist for applicability of this requirement to your project.)

#### 1. OVERVIEW OF DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION

The Environmental Protection Agency's (EPA) new Disadvantaged Business Enterprise (DBE) rule became effective on May 27, 2008. The new DBE rule sets forth an EPA program that serves the compelling government interest of remedying past and current racial discrimination through agency-wide procurement objectives. The new DBE rule revises and replaces EPA's Minority and Women Business Enterprise (MBE/WBE) Program for funding received after May 27, 2008.

Note that the loan recipient is not a passive conduit of the contractor's DBE information. By submitting the proposed contractor's DBE documentation to the SRF Loan Program for review, the loan recipient is asserting that it has found the proposed contractor's documentation of good faith efforts adequate.

In order to be counted as a MBE/WBE under the new EPA DBE rule, MBE/WBEs must be certified by a federal agency (e.g., EPA, Small Business Administration, Department of Transportation) or by a State, locality, Indian Tribe, or independent private organization that meets the certification requirements of the new EPA DBE rule. Under the new EPA DBE rule an individual claiming economic disadvantaged status must have an initial and continued personal net worth of less than \$750,000.

Locating potential DBE sub-contractors is the responsibility of the bidder/contractor. The Colorado Department of Transportation does maintain a listing of some certified DBE'S on its website at <a href="http://coloradodbe.org/">http://coloradodbe.org/</a>

Applications for certification by EPA can be found on EPA's Small Business Programs website at <a href="http://www.epa.gov/osbp/dbe\_fair.htm">http://www.epa.gov/osbp/dbe\_fair.htm</a> under Certification Forms.

1. Each procurement contract signed by a loan participant must include the following term and condition:

"The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract." (Appendix A to Part 33–Term and Condition)

# GUIDANCE FOR UTILIZATION OF DISADVANTAGED BUSINESS ENTERPRISES REQUIREMENTS OF 40 CFR PART 33

#### A. REQUIREMENTS

1. Each procurement contract signed by a loan recipient must include the following term and condition:

The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available

#### remedies.

- 2. The recipient and prime contractor will create and maintain a bidders list if the recipient of the loan is subject to, or chooses to follow, competitive bidding requirements. The purpose of a bidders list is to provide the recipient and entities receiving identified loans who conduct competitive bidding with as accurate a database as possible about the universe of MBE/WBE and non-MBE/WBE prime and subcontractors. The list must include all firms that bid or quote on prime contracts, or bid or quote subcontracts on EPA assisted projects, including both MBE/WBEs and non-MBE/WBEs. The bidders list must only be kept until the project period for the identified loan has ended. The following information must be obtained from all prime and subcontractors:
  - a. Entity's name with point of contact;
  - b. Entity's mailing address, telephone number, and e-mail address;
  - c. The procurement on which the entity bid or quoted, and when; and
  - d. Entity's status as an MBE/WBE or non-MBE/WBE.
- 3. The recipient and prime contractor will exercise good faith efforts to attract and utilize small, minority, and women's business enterprises primarily through outreach, recruitment, and race/gender neutral activities; at a minimum, fulfillment of the six affirmative steps set forth below:
  - a. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
  - b. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
  - c. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
  - d. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
  - e. Use the services of the SBA and the Minority Business Development Agency of the Department of Commerce.
  - f. If the prime contractor awards subcontract, require the prime contractor to take steps in paragraphs (a) through (e) of this section
- 4. The prime contractor must pay its subcontractors for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the owner.
- The prime contractor must notify the owner in writing prior to any termination of a DBE subcontractor for convenience.
- 6. If a DBE subcontractor fails to complete work under the subcontract for any reason, the prime contractor must employ the good faith efforts if soliciting a replacement subcontractor, even if the fair share objectives have already been achieved.

#### B. Fair Share Objectives

1. The Colorado SRF project goals are:

SRF Project	%MBE	%WBE
Construction	6.1%	<b>6.6</b> %

#### C. DEFINITIONS

- 1. <u>Disadvantaged Business Enterprise (DBE)</u> is a business concern which meets the qualifications of a <u>Minority Business Enterprise (MBE)</u>, Women's Business Enterprise (WBE)
- 2. <u>Minority Business Enterprise (MBE)</u> is a business concern which is:
  - Certified as socially and economically disadvantaged by the Small Business Administration;
    - i. <u>Socially disadvantaged individuals</u> are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities.
    - ii. <u>Economically disadvantaged individuals</u> are those socially disadvantaged individuals whose ability to compete in the free enterprise system is impaired due to diminished capital and credit opportunities, as compared to others in the same business area who are not socially disadvantaged. In determining the degree of diminished credit and capital opportunities, the Small Business Administration shall consider, but not be limited to, the assets and net worth of such socially disadvantaged individuals. Individuals who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans), are to be considered socially and economically disadvantaged. Economically disadvantaged individuals are deemed to include women.
  - b. Certified as a minority business enterprise by a State or Federal agency; and
  - c. An independent business concern which is at least 51 percent owned and controlled by minority group member(s).
    - i. A minority group member is an individual who is a citizen of the United States and one of the following:
      - 1. Black American;
      - 2. <u>Hispanic American</u> (with origins from Puerto Rico, Mexico, Cuba, South or Central America)
      - 3. Native American (American Indian, Eskimo, Aleut, native Hawaiian); or
      - 4. <u>Asian-Pacific American (</u>with origins from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, Taiwan or the Indian subcontinent).

- ii. In order to satisfy this third criteria of the MBE definition, the minority ownership's interest must be real, substantial and continuing. Such interest is characterized by:
  - 1. Risk of loss/share of profit commensurate with the proportional ownership; and
  - 2. Receipt of the customary incidents of ownership, such as compensation (i.e., salary and other personnel compensation).
- iii. A minority owner must have and exercise control of the business decisions. Characteristics of control include, but are not limited to:
  - 1. Authority to sign bids and contracts;
  - 2. Decisions in price negotiations;
  - 3. Incurring liabilities for the firm;
  - 4. Final staffing decisions;
  - 5. Policy-making; and
  - 6. General company management decisions.
- iv. Only those firms performing a useful business function according to custom and practice in the industry, are qualified as MBEs. Acting merely as a passive conduit of funds to some other firm where such activity is unnecessary to accomplish the project does not constitute a "useful business function according to custom and practice in the industry. "The purpose of this approach is to discourage the use of MBE "fronts" and limit the creation of an artificial supplier and broker marketplace.
- 3. <u>Women's Business Enterprise (WBE)</u> is a business which is certified as such by a State or Federal agency, or which meets the following definition:

"A women's business enterprise is an independent business concern which is at least 51 percent owned by a woman or women, who also control and operate it. Determination of whether a business is at least 51 percent owned by a woman or otherwise qualified WBE which is 51 percent owned by a married woman in a community property State will not be disqualified because her husband has a 50 percent interest in her share. Similarly, a business which is 51 percent owned by a married man and 49 percent owned by an unmarried woman will not become a qualified WBE by virtue of his wife's 50 percent interest in his share of the business."

As in the case of a MBE, only United States citizens will be deemed to be WBEs. Similar to the MBE criteria, WBE should meet the criteria cited in subparagraphs B.1.c.(2), (3), and (4).

- 4. <u>Fair Share or Fair Share Objective.</u> A fair share or a fair share objective is an amount of funds reasonably commensurate with the total project funding and the availability of qualified MBEs and WBEs, taking into account experience on EPA-funded projects and other comparable projects in the area. A fair share objective does not constitute an absolute requirement, but a commitment on the part of the bidder to exercise good faith efforts as defined in this section to use MBEs and WBEs to achieve the fair share objective.
- 5. <u>Recipient</u> A party receiving SRF financial assistance.

- 6. Project The scope of work for which an SRF loan is awarded.
- 7. <u>Bidder</u> A party seeking to obtain a contract with a recipient through a competitive, advertised, sealed bid process.
- Offeror A party seeking to obtain a contract with a recipient through a negotiative procurement process.
- 9. <u>Prime Contractor</u> A party that has obtained a contract with a recipient through a competitive, advertised, sealed bid process.
- 10. <u>Good Faith Efforts</u> Good faith efforts by a recipient, prime contractor, and/or bidder/offeror means efforts to attract and utilize DBEs primarily through outreach, recruitment, and race/gender neutral activities. The following are examples of activities to assist recipients, prime contractors and/or bidders/offerors to comply with good faith efforts.
  - a. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
    - i. Maintain and update a listing of qualified MBE/WBEs that can be solicited for construction, equipment, services and/or supplies.
    - ii. Provide listings to all interested parties who request copies of the bidding or proposing documents.
    - iii. Contact appropriate sources within your geographic area and state to identify qualified MBE/WBE for placement on your MBE/WBE business listings.
    - iv. Utilize other MBE/WBE listings such as those of the state's minority business office, the Small Business administration, Minority Business Development Agency (MBDA) of the Department of Commerce, EPA OSDBU, and DOT.
    - v. have state environment agency personnel review solicitation lists.
  - b. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
    - Develop realistic delivery schedules which may provide for greater MBE/WBE participation.
    - Advertise through the minority media in order to facilitate MBE/WBE utilization. Such advertisements may include, but are not limited to, contracting and subcontracting opportunities, hiring and employment, or any other matter related to the project.
    - iii. Advertise in general circulation publications, trade publications, state agency publications and minority and women's business focused media concerning contracting opportunities on your projects. Maintain a list of minority and/or women's business-focused publications that may be utilized to solicit MBE/WBEs.
  - c. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

- i. Perform an analysis to identify portions of work that can be divided and performed by qualified MBE/WBEs.
- ii. Scrutinize the elements of the total project to develop economical units of work that are within the bonding range of MBE/WBEs.
- iii. Conduct meetings, conferences, and follow-ups with MBE/WBE associations and minority media to inform these groups of opportunities to provide construction, equipment, services and supplies.
- d. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
  - i. Notify MBE/WBEs of future procurement opportunities so they may establish bidding solicitations and procurement plans.
  - ii. Provide MBE/WBE trade organizations with succinct summaries of solicitations.
  - Provide interested MBE/WBEs with adequate information about plans, specifications, timing and other requirements of the proposed projects.
- e. Use the services of the SBA and the Minority Business Development Agency of the Department of Commerce.
  - Use the services of outreach programs sponsored by the MBDA and/or the SBA to recruit bona fide firms for placement on DBE bidders lists to assist these firms in the development of bid packaging.
  - Seek out Minority Business Development Centers (MBDCs) to assist recipients and prime contractors in identifying MBE/WBEs for potential work opportunities on projects.
- f. If the prime contract awards subcontracts, require the prime contractor to take steps in Paragraphs (a) through (e) of this section.

#### D. REPORTING

1. The recipient must submit "DBE Utilization Under Federal Grants, Cooperative Agreements, and Interagency Agreements," to the Project Administrator beginning with the Federal Fiscal year quarter the bid is awarded and continuing until the project is completed. These reports must be submitted within 5 days of the end of the Federal fiscal quarter or by January 5, April 5, July 5, and October 5. Please e- mail reports to:

#### Cdphe\_grantsandloans@state.co.us

- 2. Bidders/offerors shall demonstrate compliance with good faith efforts in order to be deemed responsible.
- 3. The prime contractor must distribute DBE Program Subcontractor Participation Form (EPA Form 6100-2) to all of its DBE subcontractors. The subcontractors can submit completed forms to the State of Colorado, Water Quality Control Division, Grants and Loans Unit.
- 4. The prime contractor must have its DBE subcontractors complete DBE Program Subcontractor Performance Form (EPA Form 6100-3) and should include completed forms in its bid or proposal package.
- 5. The prime contractor must complete DBE Program Subcontractor Utilization Form (EPA Form 6100-4) which should be submitted as part of its bid or proposal package.

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

6. Form 6100-3 and Form 6100-4 must be submitted by the apparent low-bidder within ten calendar days of the bid opening. Failure to submit this information will be viewed as a non-responsive bid.

Revised March 20, 2019

22

#### Section 5

Equal Employment Opportunity and Affirmative Action Requirements on Federally Assisted Construction Contracts

A. <u>NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE</u> EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

> This notice shall be included in, and shall be a part of, all solicitations for offers and bids on all federal and federally assisted construction contracts or subcontracts.

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

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

Minority Participation In	Female Participation In
Each Trade	Each Trade
<mark>00.0%</mark>	<b>6.9%</b>
( County)	(National)

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

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

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

(4) As used in this Notice, and in the contract resulting from this solicitation, the covered area is <u>County</u>.

### B. EQUAL OPPORTUNITY CLAUSES

(1) The Equal Opportunity Clause published at 41 CFR Part 60-1.4(b) is required to be included in, and is part of, all nonexempt federally assisted construction contracts and subcontracts. By operation of the order, the equal opportunity clause shall be considered to be a part of every contract and subcontract required by the order and the regulations in this part to include such a clause whether or not it is physically incorporated.

(2) In addition to the clauses described above, all federal contracting officers, all applicants, and all non-construction contractors, as applicable, shall include the specifications set forth in this section in all federal and federally assisted construction contracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to 41 CFR 60-4.6 of this part and in construction subcontracts in excess of \$10,000 necessary in whole or in part to the performance of nonconstruction Federal contracts and subcontracts covered under the Executive Order.

# STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

- A. DEFINITIONS AS USED IN SPECIFICATIONS
  - "Covered Area" means the geographical area described in solicitation from which this contract resulted;
  - (2) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
  - (3) "Employer identification number" means the Federal Social Security number used on the employer's quarterly Federal Tax Return, U.S. Treasury Department Form 941.
  - (4) "Minority" includes:
    - (a) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
    - (b) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
    - (c) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asian, the Indian Subcontinent, or the Pacific Islands);
    - (d) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North American and maintaining identifiable tribal affiliations through membership and participation or community identification).

#### B. DETAILED SPECIFICATIONS

(1) Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$25,000 the provisions of these specifications and the Notice which contains the applicable

goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

- (2) If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area, (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- (3) The contractor shall implement the specific affirmative action standards provided in paragraphs (6)(a) through (p) of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably by able to achieve in each construction trade in which it has employees in the covered area. The contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
- (4) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
- (5) In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
- (6) The contractor shall take specific affirmative action to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific
  - b. Attention to minority or female individuals working at such sites or in such facilities.
  - c. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations where the contractor or its unions have employment opportunities available, and maintain a record of the organization's responses.

- d. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the contractor may have taken.
- e. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- f. Develop on-the-job training opportunities and/or participate in training programs for the areas which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under (7)(b) above.
- g. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- h. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- i. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.
- j. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations servicing the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- k. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.
- Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

- m. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- n. Ensure that seniority practices, job classification, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations are followed.
- Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- p. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- q. Conduct a review, at least annually, of all supervisor's adherence to and performance under the contractor's EEO policies and affirmative action obligations.
- (7) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (6)(a) through (p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under (6)(a) through (p) of the specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.
- (8) A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally, the contractor may be in violation of the order if a specific minority group of women is under-utilized).
- (9) The contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
- (10) The contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.
- (11) The contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall

be in violation of these specifications and Executive Order 11246, as amended.

- (12) The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph (6) of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.3.
- (13) The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
- (14) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

#### Section 6

#### Williams Steiger Occupational Safety and Health Act of 1970

#### A. Authority

(1) The contractor is subject to the provisions of the Williams-Steiger Occupational Safety and Health Act of 1970.

(2) These construction documents and the joint and several phases of construction hereby contemplated are to be governed, at all times, by applicable provisions of the Federal law(s), including but not limited to the latest amendment of the following:

- Williams-Steiger Occupational Safety and Health Act of 1970, Public Law 94-596;
- b. Part 1910 Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations;
- c. Part 1926 Safety and Health Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

#### B. Safety and Health Program Requirements

(1) This project, its prime contractor and its subcontractors, shall at all times be governed by Chapter XVII of Title 29, Code of Federal Regulations, Part 1926 - Safety and Health Regulations for Construction (29 CFR 22801), as amended to date.

(2) To implement the program and to provide safe and healthful working conditions for all persons, general project safety meetings will be conducted at the site at least once each month during the course of construction, by the construction superintendent or his/her designated safety officer. Notice of such meeting shall be issued not less than three (3) days prior, stating the exact time, location, and agenda to be included. Attendance by the owner, architect, general foreman, shop steward(s), and trades, or their designated representatives, witnessed in writing as such, shall be mandatory.

(3) To further implement the program, each trade shall conduct a short gang meeting, not less than once a week, to review project safety requirements mandatory for all persons during the coming week. The gang foreman shall report the agenda and specific items covered to the project superintendent, who shall incorporate these items in his/her daily log or report.

(4) The prime contractor and all subcontractors shall immediately report all accidents, injuries, or health hazards to the owner and architect, or their designated representatives, in writing. This shall not obviate any mandatory reporting under the provisions of the Occupational Safety and Health Act of 1970.

(5) This program shall become a part of the contract documents and the contract between the owner and prime contractor, prime contractor and all subcontractors, as though fully written therein.

#### Section 7

### Discovery of Archaeological and Other Historical Items

A. Construction Procedures

- (1) In the event of an archaeological or more recent historical find (e.g., artifacts, housing sites) during any phase of construction, the following procedure should be followed:
- (2) Construction shall be halted, with as little disruption to the archaeological site possible.
- (3) The Contractor shall notify the Owner who shall contact the State Historical Preservation Officer.
- (4) The State Historical Preservation Officer may decide to have an archaeologist inspect the site and make recommendations about the steps needed to protect the site, before construction is resumed.
- (5) The entire event should be handled as expediently as possible in order to hold the loss in construction time to a minimum while still protecting archaeological finds.
- B. National Register Status

In the event archaeological/historical data are evaluated to meet National Register criteria, the Advisory Council on Historic Preservation may be notified and asked to comment by the Water Quality Control Division.

#### Forms by Section

SRF forms can be found on this webpage: <u>https://www.colorado.gov/pacific/cdphe/water-quality-</u><u>srf-forms</u>

Section 1 - Davis Bacon Prevailing Wages

- Davis Bacon Certification Form (SRF form)
- WH 347 Contractors Payroll Form
- Standard Form 1444 Request for Authorization of Additional Classification and Rate
- Standard Form 1445 Labor Standards Interview Form

Section 2 - American Iron and Steel

- American Iron and Steel Certification Form (SRF Form)
- American Iron and Steel Product Spreadsheet (SRF Form)

Section 3 - National Term on Suspension and Debarment

• No applicable forms

Section 4 - Disadvantaged Business Enterprise (DBE)

- EPA Form 6100-2 provided by prime contractor completed by DBE subcontractor and submitted to EPA at <u>R8grants@epa.gov</u>
- EPA Form 6100-3 provided by prime contractor completed by DBE subcontractor and submitted to EPA at <u>R8grants@epa.gov</u>
- EPA Form 6100-4 provided by subrecipient completed by prime contractor as part of bid package
- Form B provided by subrecipient completed by prime contractor submitted to SRF program at <u>Cdphe\_grantsandloans@state.co.us</u>

Section 5 - Equal Employment Opportunity and Affirmative Action Requirements

• No applicable forms

Section 6 - Williams Steiger Occupational Safety and Health Act of 1970

• No applicable forms

Section 7 - Discovery of Archaeological and Other Historical Items

• No applicable forms
Davis Bacon Certification Form (SRF form)



**COLORADO** Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

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

Period From: \_\_\_\_\_To:\_\_\_\_\_

# Davis-Bacon Act CERTIFICATION

I certify to the best of my knowledge and belief that the above referenced project:

Complies with Davis-Bacon and Related Acts and that all laborers and mechanics employed by contractors and subcontractors during the above referenced period were paid wages at rates not less than those listed on the prevailing wage rate contained in the contract documents and that all applicable provisions of the Davis-Bacon and Related Acts have been met.

Name of Loan Recipient

Date

Signature of Authorized Official

Print Name and Title of Authorized Official

U.S. Department of Labor Wage and Hour Division	Far Contractor's Ontional lise: See Insti	AYROLL	nskuh247inetr html	*
	Persons are not required to respond to the collection o	f information unless it displays a currently valid	1 OMB control number. Rev.	Dec. 2008
NAME OF CONTRACTOR		ADDRESS	OMB	No.: 1235-0008 es: 01/31/2015
PAYROLL NO.	FOR WEEK ENDING	PROJECT AND LOCATION	PROJECT OR CONTRACT NO.	
10005 (1)	(3) (4) DAY AND DATE	(5) (8) (7)	(8) DEDUCTIONS	NFT (9)
NAME AND INDIVIDUAL IDENTIFYING NUMBER 바로드 (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY 이번 문화 NUMBER) OF WORKER	CLASSIFICATION HOURS WORKED EACH DAY	TOTAL RATE AMOUNT HOURS OF PAY EARNED FIC	2A HOLDING TOTA	IONS FOR WEEK
	0 			
	60 			
	0			
	60			
	• •			
	0			
	69			
	0			
	0 			
	0			
	0 			
While completion of FormWH-347 is optional, it is mandatory for cove (40 U.S.C. § 3145) contractors and subcontactors performing works (20 C.F.R. § 5.56)(30)) require contractors to solumit week/a a copy of or mechanic has been paid not less than the proper Davis-Bacon prev	red contractors and subcontractors performing work on Federally fit The detailly financed or assisted construction contracts to "furrish w all psyrols to the Federal agency contracting for or financing the alling wage rate for the work performed. DOL and federal contractin	anced or assisted construction contracts to respond t setly a statement with respect to the wages paid each instruction project accompanied by a signed. "Statem g agencies receiving this information review the inform	to the information collection contained in 29 C.F.R. §§.3.3,5.5(a). The Co hemployee during the preceding week? U.S. Department of Labor (200 end of Compliance? indicating that the payrolis are correct and complete radion to determine that employees have received legally required wages	ppeland Act L) regulations at and that each laborer s and fringe benefits.
	Public Burden Statem	ent		
We estimate that is will take an average of 55 minutes to complete this any comments regarding these estimates or any other aspect of this co Washington, D.C. 20210	collection, including time for reviewing instructions, searching exist ilection, including suggestions for reducing this burden, send them	ng data sources, gathering and maintaining the data i to the Administrator, Wage and Hour Division, U.S. Di	needed, and completing and reviewing the collection of information. If you epartment of Labor, Room S3502, 200 Constitution Avenue, N.W.	u have
	(0/e1)			

 $WH-347\xspace$  - Contractors Payroll Form

in addition to the basic hourly wage rates paid to each laborer or mechanic listed in	(4) That: (a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS	(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.	(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.	REX		3 (29 C.F.R. Subttle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967, 76 Stat. 357, 40 U.S.C. § 3145), and described below:	weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations. Part	(Contractor or Subcontractor) from the full	all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said	(Building or Work)	(Contractor or Subcontractor)	(1) That I pay or supervise the payment of the persons employed by	(Name of Signatory Party) (Title) do hereby state:	1,	Date
E WILLFUL FALSFICATION OF ANY OF THE ABOVE STA	ME AND TITLE			MARKS							EXCEPTION (CRAFT)	(c) EXCEPTIONS	as indicated on the payroll, a basic hourly wage rate plus t in the contract, except as no	<ul> <li>Each laborer or mechanic lis</li> </ul>	(b) WHERE FRINGE BENEFITS ARE PAID IN
TEMENTS MAY SUBJECT THE CONTRACTOR OR EE SECTION 1001 OF TITLE 15 AND SECTION 231 OF TITLE	SIGNATURE										EXPLANATION		n amount not less than the sum of the applicable re amount of the required fringe benefits as listed ed in section 4(c) below.	ed in the above referenced payroll has been paid,	CASH

# Standard Form 1444 - Request for Authorization of Additional Classification and Rate

					AUTHORIZ	ED FOR LOCAL REPRODUCTION	
REQUEST F ADDITIONAL C	FOR AUTHORIZATION OCLASSIFICATION AND R	OF RATE	CHECK APPROPRIAT	TE BOX TRACT DN CONTRACT	OMB Con Expiration	trol Number: 9000-0089 n Date: 10/31/2019	
PAPERWORK REDUCTI including the time for revic collection of information. S reducing this burden, to U 1800 F Street, NW, Wash	ON ACT STATEMENT: Public rep- ewing instructions, searching existin Send comments regarding this burd I.S. General Services Administration ington, DC 20405.	orting burde ng data sour len estimate n, Regulato	n for this collection c rces, gathering and r or any other aspect ry Secretariat (MVCE	of information is naintaining the s of this collect 3)/IC 9000-008	estimated to a data needed, ion of informat 9, Office of Go	average .5 hours per response, and completing and reviewing the ion, including suggestions for wernmentwide Acquisition Policy,	
INSTRUCTIONS: THE CO	ONTRACTOR SHALL COMPLETE HE CONTRACTING OFFICER.	ITEMS 3 TI	HROUGH 16, KEEP	A PENDING C	OPY, AND SU	JBMIT THE REQUEST, IN	
1. TO: ADMINISTRATOR, WAGE AND HOUR D U.S. DEPARTMENT WASHINGTON, DC	IVISION DF LABOR 20210		2. FROM: (REPORTI	NG OFFICE)			
3. CONTRACTOR					4. DA1	TE OF REQUEST	
5. CONTRACT NUMBER	6. DATE BID OPENED (SEALED BIDDING)	7. DATE OF	AWARD	8. DATE CONT STARTED	TRACT WORK	9. DATE OPTION EXERCISED (IF APPLICABLE) (SERVICE CONTRACT ONLY)	
10. SUBCONTRACTOR (IF )	l ANY)						
11. PROJECT AND DESCRI	PTION OF WORK (ATTACH ADDITION	AL SHEET IF	NEEDED)				
12. LOCATION (CITY, COUN	ITY AND STATE)						
13. IN ORDER TO COMPLE INDICATED CLASSIFICA	TE THE WORK PROVIDED FOR UNDE TION(S) NOT INCLUDED IN THE DEP	R THE ABO\ ARTMENT O	/E CONTRACT, IT IS N F LABOR DETERMINA	ECESSARY TO	ESTABLISH TH	E FOLLOWING RATE(S) FOR THE	
NUMBER:			DATED:				
a. LIST IN ORDER: PROPOSED CLASSIFICATION TITLE(S); JOB DESCRIPTION(S); DUTIES; AND RATIONALE FOR PROPOSED CLASSIFICATIONS (Service contracts only) b. WAGE RATE(S) C. FRINGE BENEFITS PAYMENTS							
14. SIGNATURE AND TITLE (IF ANY)	OF SUBCONTRACTOR REPRESENT/	ATIVE	15. SIGNATURE AND	TITLE OF PRIM	E CONTRACTO	DR REPRESENTATIVE	
16. SIGNATURE OF EMPLO	YEE OR REPRESENTATIVE		TITLE		CHECK APP	ROPRIATE BOX-REFERENCING BLOCK 13.	
						BREE DISAGREE	
TO BE COMPLETED STANDARDS) OR FA	BY CONTRACTING OFFICER <i>R</i> 22.406-3 (CONSTRUCTION RTIES AGREE AND THE CONTRACTI	(CHECK A WAGE RA	AS APPROPRIAT ATE REQUIREME R RECOMMENDS APP	E - SEE FAR NTS)) ROVAL BY THE	22.1019 (SE WAGE AND HO		
INFORMATION AND F	RECOMMENDATIONS ARE ATTACHED RTIES CANNOT AGREE ON THE PRO IS THEREFORE REQUESTED. AVAIL	D. OPOSED CLA ABLE INFOR	SSIFICATION AND WA	AGE RATE. A DE	ETERMINATION	OF THE QUESTION BY THE WAGE	
SIGNATURE OF CONTRAC REPRESENTATIVE	(Si	end 3 copies to	the Department of Labor)	IAL TELEPHONE	ENUMBER D	ATE SUBMITTED	
PREVIOUS EDITION IS USA	BLE				STANI Pres	DARD FORM 1444 (REV. 4/2013) cribed by GSA-FAR (48 CFR) 53.222(f)	

# Standard Form 1445 – Labor Standards Interview Form Section 2 – American Iron and Steel

					AUT	HORIZEL	J FOR LOCAL RI	EPRODUCTION
REQUEST F ADDITIONAL C	FOR AUTHORIZATION C	OF RATE	CHECK APPROPRIAT	E BOX FRACT IN CONTRACT	OMB Expir	Contr ation	ol Number: Date: 10/31	9000-0089 /2019
PAPERWORK REDUCTION including the time for review collection of information. S reducing this burden, to U 1800 F Street, NW, Wash	ON ACT STATEMENT: Public rep- ewing instructions, searching existin Send comments regarding this burd I.S. General Services Administration ington, DC 20405.	orting burde ng data sour len estimate n, Regulato	en for this collection of rces, gathering and r e or any other aspect ry Secretariat (MVCE	f information is naintaining the s of this collect 3)/IC 9000-008	ata ne data ne ion of int 9, Office	ed to ave eded, an formation of Gove	erage .5 hours ad completing a n, including sug ernmentwide Ad	per response, nd reviewing the ggestions for equisition Policy,
INSTRUCTIONS: THE CO	ONTRACTOR SHALL COMPLETE HE CONTRACTING OFFICER.	ITEMS 3 T	HROUGH 16, KEEP	A PENDING C	OPY, AI	ND SUB	MIT THE REQ	UEST, IN
1. TO: ADMINISTRATOR, WAGE AND HOUR D U.S. DEPARTMENT ( WASHINGTON, DC :	IVISION DF LABOR 20210		2. FROM: (REPORT)	NG OFFICE)				
3. CONTRACTOR						4. DATE	OF REQUEST	
5. CONTRACT NUMBER	6. DATE BID OPENED (SEALED BIDDING)	AWARD	8. DATE CONT STARTED	TRACT W	ORK	9. DATE OPT APPLICAB CONTRACT (	ION EXERCISED (II LE) (SERVICE DNLY)	
10. SUBCONTRACTOR (IF A	ANY)							
11. PROJECT AND DESCRIF	PTION OF WORK (ATTACH ADDITION	IAL SHEET IF	= NEEDED)					
12. LOCATION (CITY, COUN	ITY AND STATE)							
13. IN ORDER TO COMPLET INDICATED CLASSIFICA	TE THE WORK PROVIDED FOR UNDE ATION(S) NOT INCLUDED IN THE DEP	R THE ABO	VE CONTRACT, IT IS N OF LABOR DETERMINA	ECESSARY TO TION	ESTABLI	SH THE I	FOLLOWING RA	TE(S) FOR THE
							EBINI	
AND RATIONALE FOR PR	OPOSED CLASSIFICATION TITLE(S); JOB	contracts on	nly)	b. WAG	BE RATE	(S)	C. FRIN	YMENTS
14. SIGNATURE AND TITLE (IF ANY)	OF SUBCONTRACTOR REPRESENT	ATIVE	15. SIGNATURE AND	TITLE OF PRIM	E CONTI	RACTOR	REPRESENTAT	IVE
16. SIGNATURE OF EMPLO	YEE OR REPRESENTATIVE		TITLE		CHE	CK APPRO	OPRIATE BOX-REFI	ERENCING BLOCK 13
						AGR	REE	DISAGREE
TO BE COMPLETED E STANDARDS) OR FA	BY CONTRACTING OFFICER R 22.406-3 (CONSTRUCTION RTIES AGREE AND THE CONTRACTI RECOMMENDATIONS ARE ATTACHED	(CHECK) WAGE RA ING OFFICER	AS APPROPRIAT ATE REQUIREME R RECOMMENDS APP	<b>E - SEE FAR</b> NTS)) ROVAL BY THE	22.101	<b>9 (SER</b>	RVICE CONT	RACT LABOR
AND HOUR DIVISION	RTIES CANNOT AGREE ON THE PRO IS THEREFORE REQUESTED. AVAIL (S)	POSED CLA ABLE INFOR	ASSIFICATION AND WA RMATION AND RECOM	AGE RATE. A DI IMENDATIONS A	ETERMIN	ATION O ACHED.	F THE QUESTIC	ON BY THE WAGE
SIGNATURE OF CONTRACT REPRESENTATIVE		1	TITLE AND COMMERC	IAL TELEPHONE	ENUMBE	R DAT	TE SUBMITTED	
PREVIOUS EDITION IS USA	BLE				s	TANDA	ARD FORM 1	444 (REV. 4/2013)

Prescribed by GSA-FAR (48 CFR) 53.222(f)

American Iron and Steel Certification Form (SRF Form)



**COLORADO** Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

# American Iron and Steel Certification

Project Name:

Period From:\_\_To:\_\_\_\_\_

Section 436 of the Consolidated Appropriations Act, 2014 states that:

None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

To meet this requirement, the undersigned hereby certifies that all iron and steel products which are to be incorporated into the <u>(Name of Construction Contract)</u>, has been manufactured and/or fabricated using domestic iron and steel as defined by the above referenced section 436 of P.L.

113-76 and EPA's Guidance Memorandum dated March 20, 2014 for Implementation of American Iron & Steel unless an appropriate waiver has been granted by the Administrator of the Environmental Protection Agency.

Name of Loan Recipient

Date

Signature of Authorized Official

Print Name and Title of Authorized Official

NOTE: A current completed copy of the American Iron and Steel Products tracking spreadsheet <u>MUST</u> accompany this document.

	American Iron a	and Steel (	Certification		
	B	orrower Nan	:e:		
	0	ontractor:			
	P	roject Numb	er:	Date:	
Procurement Date	Product Description	Quantity	Cost	*Type of Certification Used ~Manufacturer/Fabricating Shipment Wavier (Pick One)	New or Existing Certification
* used to	verify chain of custody control for product				

# American Iron and Steel Product Spreadsheet (SRF Form)

ł

includes melting, bonding, coating, galvanizing, cutting, etc.



Department of Public Health & Environment

OLORADO

Dedicated to protecting and improving the health

bue

environment of the people of Colorado

# SECTION 01 10 00 - SUMMARY

# PART 1 GENERAL

# 1.1 SUMMARY

- A. This Section includes the following basic identification of the Work and general information:
  - 1. Project Description
  - 2. Work Included in Project
  - 3. Project Contacts
  - 4. Work by Contractor
  - 5. Work Schedule
  - 6. Regulatory Requirements
  - 7. Underground Utilities
  - 8. Permits
  - 9. Work Sequence
- B. The project Contract Documents prepared by AquaWorks DBO, Inc. (Engineer), including Drawings and Project Manual, comprise the description of the project and Work.
- C. In general, the Work consists of furnishing all labor, materials, equipment and incidentals, and performing all construction, installation, and testing of improvements, modifications, and additions described or specified on the Drawings or in the Project Manual.
- D. Engineer is not responsible for construction means, methods, coordination, or scheduling. Engineer is not responsible for jobsite safety.

# 1.2 RELATED SECTIONS

- A. Section 00 72 15 General Conditions
- B. Section 00 73 14 Supplementary Conditions

### 1.3 **PROJECT DESCRIPTION**

A. The work for this Contract generally includes the replacement of 30,000 +/- linear feet of 4" water distribution line, installation of a 100,000-gallon water storage tank, construction of two water treatment buildings, drilling 2 raw water wells, and associated improvements.

# 1.4 WORK INCLUDED IN PROJECT

- A. Provide and install all piping, equipment, accessories, appurtenances, and materials as included in the technical drawings and specifications for a complete and functional project.
- B. Technical drawings consist of the following:

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

Sheet Number	Sheet Title
G1	Cover
G2	Abbreviations & Symbols
G3	Notes & Requirements
G4	Process Flow Diagram
G5	Hydraulic Profile
G6	Well Installation Details
WST1	Water Storage Tank Site Plan
WST2	Water Storage Tank Plan & Profile
WST3	Water Storage Tank Details
CB1	Control Building A Site Plan
CB2	Control Building A Plan
CB3	Control Building A Sections
CB4	Control Building B Site Plan
CB5	Control Building B Plan
CB6	Control Building B Sections
CB7	Civil Details
CB8	Civil Details 2
CB9	Erosion Control Details
SC1	SCADA Plan
S1	Structural Notes & Specifications
S2	Foundation Plan
S3	Foundation Details
E1	Electrical Notes & Details
E2	Electrical One Line & Tables
E3	Control Building A Electrical
E4	Control Building B Electrical
E5	Electrical Well Power

# 1.5 PROJECT CONTACTS

- A. Civil Engineer: AquaWorks DBO, Inc.1. Mr. Adam Sommers, P.E.: Phone (303) 477-5915
- B. System Operator:
  - 1. Mr. Lynn Willow, Phone: (719) 482-5125
- C. Structural Engineer: Wallace Engineering
  - 1. Mr. Pryce Joyner, P.E. (303) 350-1690
- D. Electrical Engineer: Straightedge, Inc.
  - 1. Mr. Bill Brunner, P.E. (303) 403-0531

# 1.6 WORK BY CONTRACTOR

- A. Contractor is responsible for completing work activities in accordance with the Conformed and Sealed Contract Documents in their entirety. In addition, Contractor shall coordinate and facilitate the progress of the Work including coordination between trades, subcontractors, suppliers, equipment manufacturers, and public utilities.
- B. Contractor is solely responsible for construction means, methods, and jobsite safety.
- C. Work may be performed by Subcontractors or Suppliers as subcontracted by General Contractor.

### 1.7 WORK SCHEDULE

A. Work Times are as established in the Agreement.

### 1.8 REGULATORY REQUIREMENTS

- A. Comply with all federal, state, and local laws, regulations, codes, and ordinances applicable to the Work.
- B. For reference, the project is located in unincorporated Teller County, Colorado.

# 1.9 UNDERGROUND UTILITIES

- A. Any known sewers, water mains, gas mains, telephone conduits, electrical cables, and other underground utilities may be shown on the drawings. This information is shown for the convenience of the contractor but is not guaranteed to be either correct or complete.
- B. The Contractor shall make such investigation as he/she thinks necessary to verify the location of underground utilities.

C. Prior to any excavation, the Contractor shall locate all underground utilities within the limits of the project by contacting the Utility Notification Center of Colorado at 811.

# 1.10 PERMITS

A. Contractor shall obtain all necessary permits to complete the proposed work and shall comply with all local, state, and federal regulations, including but not limited to a Teller County Right-of-Way Use Permit and Colorado Department of Public Health and Environment Stormwater Discharge Permit.

# 1.11 WORK SEQUENCE

- A. Continuity of Operations / Coordination of Work with Owner
  - 1. Coordinate all construction activities with the Owner.
  - 2. Notify Engineer and Owner in writing 7 days in advance if it is necessary to perform Work to take out of service any existing distribution pipes, electrical circuits, or equipment that may disrupt normal distribution operation in order to perform Work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

# SECTION 01 25 00 - SUBSTITUTION PROCEDURES

### PART 1 GENERAL

- 1.1 1.1 SECTION INCLUDES
  - A. Quality assurance.
  - B. Product options.
  - C. Product substitution procedures.

#### 1.2 1.2 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Engineer or Owner.

#### 1.3 1.3 PRODUCT SUBSTITUTION PROCEDURES

- A. Engineer will consider requests for substitutions at any time during the project.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
  - 1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
  - 2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
  - 3. Reference to Article and Paragraph numbers in Specification Section.
  - 4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
  - 5. Changes required in other Work.
  - 6. Availability of maintenance service and source of replacement parts as applicable.
  - 7. Certified test data to show compliance with performance characteristics specified.
  - 8. Samples when applicable or requested.
  - 9. Other information as necessary to assist Engineer's evaluation.
- D. A request constitutes a representation that Contractor:
  - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
  - 2. Will provide same warranty for substitution as for specified product.

- 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
- 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- 5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.
- F. Substitution Submittal Procedure:
  - 1. Submit requests for substitutions on CSI Form 13.1A Substitution Request-After the Bidding/Negotiating Stage.
  - 2. Submit electronic files to Engineer and Owner of Request for Substitution for consideration. Limit each request to one proposed substitution.
  - 3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
  - 4. Engineer will notify Contractor in writing of decision to accept or reject request.

# PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

# SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

# PART 1 GENERAL

### 1.1 SECTION INCLUDES

- A. Coordination and Project conditions.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Closeout meeting.

# 1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various Sections of project specifications to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.
- D. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion.

### 1.3 PRECONSTRUCTION MEETING

- A. Engineer will schedule and preside over meeting after execution of agreement.
- B. Attendance Required: Engineer, Owner, and Contractor.
- C. Minimum Agenda:
  - 1. Execution of Owner-Contractor Agreement.
  - 2. Submission of executed bonds and insurance certificates.
  - 3. Distribution of Contract Documents.
  - 4. Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
  - 5. Communication procedures.
  - 6. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
  - 7. Scheduling.
- D. Engineer to record minutes and distribute electronic copies to participants within two (2) days after meeting, to Contractor, Owner, and those affected by decisions made.

# 1.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum of every other week.
- B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- C. Attendance Required: Job superintendent, major subcontractors, Engineer, and Owner, as appropriate to agenda topics for each meeting.
- D. Minimum Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Review of Work progress.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems impeding planned progress.
  - 5. Review of submittal schedule and status of submittals.
  - 6. Review of off-Site fabrication and delivery schedules.
  - 7. Maintenance of Progress Schedule.
  - 8. Corrective measures to regain projected schedules.
  - 9. Planned progress during succeeding work period.
  - 10. Coordination of projected progress.
  - 11. Maintenance of quality and work standards.
  - 12. Effect of proposed changes on Progress Schedule and coordination.
  - 13. Other business relating to Work.
- E. Engineer to record minutes and distribute copies to participants within two (2) days after meeting, to Contractor, Owner, and those affected by decisions made.

### 1.5 CLOSEOUT MEETING

- A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.
- B. Attendance Required: Contractor, Engineer, Owner, and others appropriate to agenda.
- C. Notify Engineer four (4) days in advance of meeting date.
- D. Minimum Agenda:
  - 1. System demonstration and observation.
  - 2. Operation and maintenance instructions for Owner's personnel.
  - 3. Contractor's inspection of Work.
  - 4. Contractor's preparation of an initial "punch list."
  - 5. Procedure to request Engineer inspection to determine date of Substantial Completion.
  - 6. Completion time for correcting deficiencies.
  - 7. Final cleaning.
  - 8. Preparation for final inspection.
  - 9. Closeout Submittals:
    - a. Project record documents.
    - b. Operating and maintenance documents.
    - c. Operating and maintenance materials.
  - 10. Final Application for Payment.

# Arabian Acres Metropolitan District Potable Water Distribution and Treatment Improvement Project

- 11. Contractor's demobilization of Site.
- E. Contractor to record minutes and distribute electronic copies to participants within two days after meeting, to Engineer, Owner, and those affected by decisions made.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION- Not Used

# SECTION 01 33 00 - SUBMITTAL PROCEDURES

# PART 1 GENERAL

- 1.1 SECTION INCLUDES
  - A. Definitions.
  - B. Submittal procedures.
  - C. Proposed product list.
  - D. Product data.
  - E. Samples.
  - F. Certificates.
  - G. Manufacturer's instructions.
  - H. Manufacturer's field reports.
  - I. Erection Drawings.
  - J. Construction photographs.
  - K. Engineer review.

### 1.2 **DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's responsive action.

# 1.3 SUBMITTAL PROCEDURES

- A. Electronically transmit each submittal with Engineer-accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- D. Schedule submittals to expedite Project, and submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.
- E. For each submittal for review, allow 5 days.

- F. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- G. When revised for resubmission, identify changes made since previous submission.
- H. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- I. Submittals not requested will not be recognized nor processed.
- J. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Engineer.

### 1.4 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 Execution and Closeout Requirements.

# 1.5 SAMPLES

- A. Samples: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
  - 1. Submit to Engineer for aesthetic, color, and finish selection.
  - 2. Submit Samples of finishes, textures, and patterns for Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- F. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- G. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 Execution and Closeout Requirements.

# 1.6 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.
- 1.7 MANUFACTURER'S INSTRUCTIONS
  - A. Informational Submittal: Submit manufacturer's installation instructions for Engineer's knowledge as Contract administrator or for Owner.
  - B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Engineer in quantities specified for Product Data.
  - C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

### 1.8 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

#### 1.9 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of Site and construction throughout progress of Work.
- B. Each month submit photographs with Application for Payment.
- C. Photographs: Electronic.
- D. Digital Images: Deliver complete set of digital image electronic files on CD-ROM to Owner with Project record documents. Identify electronic media with date photographs were taken.

#### 1.10 ENGINEER REVIEW

- A. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.
- B. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- C. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

# SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

A. This section covers quality control procedures for this contract.

#### 1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.
- E. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

#### 1.3 TOLERANCES

A. Adjust products to appropriate dimensions; position before securing products in place.

# 1.4 TESTING AND INSPECTION SERVICES

- A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Engineer.
  - 1. Laboratory: Authorized to operate in State of Colorado.
  - 2. Laboratory Staff: Maintain full-time Professional Engineer on staff to review services.
  - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
  - 4. Submit final report indicating correction of Work previously reported as noncompliant.
- C. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
  - 1. Notify Engineer and Owner a minimum of 24 hours before expected time for operations requiring services.
- D. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.

- E. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Engineer.
- F. Agency Reports: After each test, promptly submit electronic copies of report to Engineer. When requested by Engineer, provide interpretation of test results. Include the following:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Name and company of inspector.
  - 4. Date and time of sampling or inspection.
  - 5. Identification of product and Specification Section.
  - 6. Location in Project.
  - 7. Type of inspection or test.
  - 8. Date of test.
  - 9. Results of tests.
  - 10. Conformance with Contract Documents.
- G. Limits on Testing Authority:
  - 1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Agency or laboratory may not approve or accept any portion of the Work.
  - 3. Agency or laboratory may not assume duties of Contractor.
  - 4. Agency or laboratory has no authority to stop the Work.
- H. Field Testing:
  - 1. Field testing shall be provided for, but shall not be limited to, the following:

Type of Material, Equipment or System	Fees Paid for by:
Earthwork/Compaction Tests	Owner
Cast-in-Place Concrete	Owner
Pipe and Pipe Fittings	Contractor

# PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

# SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

#### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Temporary Utilities:
  - 1. Temporary electricity.
  - 2. Temporary heating.
  - 3. Temporary ventilation.
  - 4. Temporary sanitary facilities.

#### B. Construction Facilities:

- 1. Field storage.
- 2. Progress cleaning and waste removal.
- 3. Project identification.
- 4. Fire-prevention facilities.
- C. Temporary Controls:
  - 1. Security.
  - 2. Dust control.
- D. Removal of utilities, facilities, and controls.

### 1.2 TEMPORARY ELECTRICITY

- A. Owner will pay cost of energy used. Exercise measures to conserve energy.
- B. Complement existing power service capacity and characteristics as required for construction operations.

#### 1.3 TEMPORARY HEATING

- A. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation.
- C. Maintain minimum ambient temperature of 50 degrees F in indoor areas where construction is in progress unless indicated otherwise in individual product Sections.

### 1.4 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

# 1.5 TEMPORARY SANITARY FACILITIES

A. Contractor to provide two temporary toilet facilities, one at each Control Building. Maintain cleanliness as needed.

# 1.6 FIELD STORAGE

A. Designated spaces may be used for field storage:1. Control Buildings A& B sites.

### 1.7 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Collect and remove waste materials, debris, and rubbish from Site periodically and dispose of off-Site.

# 1.8 PROJECT IDENTIFICATION

- A. Project Identification Sign:
  - 1. One painted sign, 32-sq ft area, bottom 6 feet aboveground.
  - 2. Content:
    - a. Project title, address, and name of Owner.
    - b. Name of Design Builder.
    - c. Name of Engineer.

#### B. Installation:

- 1. Install Project identification sign within 15 days after date established by Notice to Proceed.
- 2. Erect at location of high public visibility adjacent to main entrance to Site.
- 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
- 4. Install sign surface plumb and level, with butt joints. Anchor securely.
- 5. Paint exposed surfaces of sign, supports, and framing.
- C. Maintenance: Maintain clean signs and supports; repair deterioration and damage.
- D. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

#### 1.9 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings under construction and demolition.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- C. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.
  - 1. Maintain a minimum of one fire extinguisher on site at all times.

### 1.10 SECURITY

- A. Security Program:
  - 1. Protect Work on existing premises from theft, vandalism, and unauthorized entry.
  - 2. Initiate program at Project mobilization.
  - 3. Maintain program throughout construction period until substantial completion.

# 1.11 DUST CONTROL

- A. Execute Work by methods that minimize raising dust from construction operations.
- B. Provide positive means to prevent airborne dust from dispersing into atmosphere.

# 1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before substantial completion inspection.
- B. Clean and repair damage caused by installation or use of temporary Work.
- C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

# SECTION 01 60 00 - PRODUCT REQUIREMENTS

# PART 1 - GENERAL

# 1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Equipment electrical characteristics and components.

# 1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- E. Furnish interchangeable components from same manufacturer for components being replaced.

### 1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products according to manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

### 1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.

D. For exterior storage of fabricated products, place products on sloped supports aboveground. Section 01 60 00-Product Requirements Page 186

- E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

### 1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 01 25 00 Substitution Procedures.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

# SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. System Start-Up.
- B. Closeout procedures.
- C. Demonstration and instructions.
- D. Project record documents.
- E. Cutting and patching.
- F. Protecting installed construction.
- G. Final cleaning.

#### 1.2 SYSTEM START UP

- A. Contractor to pay all costs associated with system or facility start-up with the exception of electricity and bacteria testing which will be paid by Owner.
- B. Notify Owner and Engineer seven (7) days prior to start-up.
- C. Verify wiring and support components are complete and tested as shown in engineering drawings.
- D. The start-up and performance demonstration shall be successfully executed prior to Substantial Completion and acceptance by the Owner of the facility and its related systems.

#### 1.3 CLOSEOUT PROCEDURES

- A. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
  - 1. When Contractor considers Work to be complete, submit written certification that:
    - a. Work has been completed according to Contract Documents.
    - b. Work is completed and ready for final inspection.
- B. Final Completion Inspection:
  - 1. Within seven (7) days after receipt of request for final inspection, Engineer will make inspection to determine whether Work or designated portion is complete.
  - 2. Should Engineer consider Work to be incomplete or defective:
    - a. Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
    - b. Contractor shall remedy stated deficiencies and send second written request to Engineer that Work is complete.
    - c. Engineer will reinspect Work.
    - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.

# 1.4 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Addenda.
  - 3. Change Orders and other modifications to the Contract.
  - 4. Reviewed Shop Drawings, product data, and Samples.
- B. Store record documents separate from documents used for construction.
- C. Record information concurrent with construction progress, not less than weekly.
- D. Record Drawings: Legibly mark each item to record actual construction as follows:
  - 1. Include locations of concealed elements of the Work.
  - 2. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
  - 3. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
  - 4. Identify and locate existing buried or concealed items encountered during Project.

# PART 2 PRODUCTS - Not Used

# PART 3 EXECUTION

- 3.1 CUTTING AND PATCHING
  - A. Employ skilled and experienced installers to perform cutting and patching.
  - B. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.

### 3.2 PROTECTING INSTALLED CONSTRUCTION

A. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.

### 3.3 FINAL CLEANING

- A. Clean Site; sweep paved areas, restore landscaped surfaces.
- B. Remove waste and surplus materials, rubbish, and construction facilities from Site.

# SECTION 01 91 00 - COMMISSIONING

### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Commissioning description.
  - 2. Closeout submittals.
  - 4. Examination.
  - 5. Verification Check and Startup Procedures.
  - 6. Functional performance test procedures.
  - 7. Function performance test methods.
  - 8. Deficiencies and test approvals.
  - 9. Demonstration.

#### 1.2 COMMISSIONING DESCRIPTION

- A. Commissioning: Systematic process of ensuring systems perform interactively according to design intent and Owner's operational needs. Commissioning process encompasses and coordinates system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training, and verification of actual performance.
- B. Commissioning Intent:
  - 1. Verify equipment and systems are installed according to manufacturer's instructions, industry accepted minimum standards, and Contract Documents.
  - 2. Verify equipment and systems receive adequate operational checkout by Contractor.
  - 3. Verify and document proper performance of equipment and systems.
  - 4. Verify complete operation and maintenance documentation is delivered to Owner.
  - 5. Verify system operator is adequately trained.
- C. Commissioning does not relieve Contractor of responsibility to provide finished and fully functioning Project.

#### 1.3 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 Execution and Closeout Requirements contains requirements for closeout submittals.
- B. Operation and Maintenance Data: Submit operation and maintenance manuals as specified in individual equipment and system Specifications.
- C. Final Commissioning Report: Commissioning Authority will submit one (1) copy of final commissioning report including the following:
  - 1. For Each Piece of Commissioned Equipment: Include statement regarding compliance with Contract Documents in the following areas:
    - a. Equipment installation.
    - b. Functional performance and efficiency.
    - c. Equipment documentation and design intent.
    - d. Operator training.
  - 2. Include recommendations for improvement to equipment or operations, future actions, and commissioning process changes.

3. List outstanding deficiencies referenced to specific functional test, inspection, trend log, or other record where deficiency is documented.

# PART 2 PRODUCTS –NOT USED

### PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify equipment and systems are installed according to individual Specification Sections.
- B. Verify utility and power connections are complete and services operational.

### 3.2 VERIFICATION CHECK AND STARTUP PROCEDURES

- A. Verification Check and Startup:
  - 1. Perform verification check and startup according to approved verification check and startup plan.
  - 2. Complete entire plan for each piece of equipment or system indicated to be commissioned.
  - 3. Complete each procedure in sequence performed by party assigned to each procedure.
  - 4. Record completion of each procedure. Indicate results of procedure where required. Sign and date plan by individual performing procedure.
  - 5. Identify items not completed successfully.
  - 6. Sign and date plan indicating completion of entire plan.
- B. Deficiencies and Approvals:
  - 1. Engineer will review verification check and startup reports and issue deficiency report or approval.
  - 2. Correct deficiencies and resubmit updated verification check and startup report with statement indicating corrections made for Commissioning Authority approval.
  - 3. Repeat process until verification check and startup report are approved.

# 3.3 FUNCTIONAL PERFORMANCE TEST PROCEDURES

- A. Complete the following before performing functional tests:1. Verification check and startup.
- B. Engineer will direct, witness, and document results of functional performance tests.
- C. Demonstrate that each piece of equipment and system is operating according to documented design intent and Contract Documents.
  - 1. Conduct testing proceeding from components, to subsystems, to systems.
  - 2. Bring equipment and systems to condition capable full dynamic operation.
  - 3. Verify performance of individual components and systems.
  - 4. Verify performance of interactions between systems.
  - 5. Identify and correct areas of deficient performance.
- D. Operate each piece of equipment and system through each specified mode of operation including seasonal, occupied, warmup, cool-down, partial load, and full load conditions.
  - 1. Verify each sequence in sequences of operation.
  - 2. Test for proper responses to power failure, freezing, overheating, no flow, equipment failure, and other abnormal conditions.

# 3.4 FUNCTIONAL PERFORMANCE TEST METHODS

- A. Perform testing and verification by using manual testing or by monitoring performance and analyzing results using control system trend log capabilities or by standalone data loggers as specified for each piece of equipment or system.
- B. Perform each function and test under conditions simulating actual conditions as close as is practically possible.
  - 1. Provide materials, system modifications, and other items or steps necessary to produce flows, pressures, temperatures, and other responses to execute test according to specified conditions.
  - 2. At completion of test, return modified equipment and systems to pretest condition.

### 3.5 DEFICIENCIES AND TEST APPROVALS

- A. Deficiencies:
  - 1. Engineer will record and report deficiencies to Owner.
  - 2. Minor deficiencies may be corrected during tests at Commissioning Authority's discretion. Deficiency and resolution will be documented on procedure form.
  - 3. When deficiency is identified, Engineer will discuss issue with party executing test.
- B. Test Approval: Engineer notes each satisfactorily demonstrated function on functional performance test form.

#### 3.6 DEMONSTRATION

A. Demonstrate equipment and systems and train Owner's personnel as specified in individual equipment and system Specifications.

### SECTION 03 10 00 - CONCRETE FORMING AND ACCESSORIES

#### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Formwork for cast-in-place concrete.
  - 2. Shoring, bracing, and anchorage.
  - 3. Architectural form liners.
  - 4. Form accessories.
  - 5. Form stripping.

#### B. Related Sections:

1. Section 03 39 00 – Concrete Curing.

#### 1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials.
  - 2. ACI 301 Specifications for Structural Concrete.
  - 3. ACI 318 Building Code Requirements for Structural Concrete.
  - 4. ACI 347 Guide to Formwork for Concrete.
- B. ASTM International:
  - 1. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

#### 1.3 DESIGN REQUIREMENTS

A. Design and construct formwork, shoring and bracing in accordance with ACI 318 to conform to applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Perform Work in accordance with Teller County building department requirements.

### 1.5 COORDINATION

A. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

# PART 2 PRODUCTS

### 2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor.

# 2.2 PREFABRICATED FORMS

- A. Furnish materials in accordance with Teller County building department requirements.
- B. Preformed Steel Forms: Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.
- D. Pan Type: Steel of size and profile required.
- E. Steel Forms: Sheet steel, suitably reinforced, and designed for particular use indicated on Drawings.
- F. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings.
- G. Framing, Studding and Bracing: Stud or No. 3 structural light framing grade.

# PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 30 00 Administrative Requirements: Coordination and project conditions.
- B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.
- C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Engineer.

### 3.2 INSTALLATION

- A. Earth Forms:
  - 1. Earth forms are not permitted.
- B. Formwork General:
  - 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
  - 2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
  - 3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
  - 4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.
  - 5. Complete wedging and bracing before placing concrete.
- C. Forms for Smooth Finish Concrete:
  - 1. Use steel, plywood or lined board forms.

- 2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
- 3. Install form lining with close-fitting square joints between separate sheets without springing into place.
- 4. Use full size sheets of form lines and plywood wherever possible.
- 5. Tape joints to prevent protrusions in concrete.
- 6. Use care in forming and stripping wood forms to protect corners and edges.
- 7. Level and continue horizontal joints.
- 8. Keep wood forms wet until stripped.
- D. Architectural Form Liners:
  - 1. Erect architectural side of formwork first.
  - 2. Attach form liner to forms before installing form ties.
  - 3. Install form liners square, with joints and pattern aligned.
  - 4. Seal form liner joints to prevent grout leaks.
  - 5. Dress joints and edges to match form liner pattern and texture.
- E. Forms for Surfaces to Receive Membrane Waterproofing: Use plywood or steel forms. After erection of forms, tape form joints to prevent protrusions in concrete.
- F. Framing, Studding and Bracing:
  - 1. Space studs at 16 inches on center maximum for boards and 12 inches on center maximum for plywood.
  - 2. Size framing, bracing, centering, and supporting members with sufficient strength to maintain shape and position under imposed loads from construction operations.
  - 3. Construct beam soffits of material minimum of 2 inches thick.
  - 4. Distribute bracing loads over base area on which bracing is erected.
  - 5. When placed on ground, protect against undermining, settlement or accidental impact.
- G. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- H. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- I. Obtain Engineer's approval before framing openings in structural members not indicated on Drawings.
- J. Do not reuse wood formwork more than one time for concrete surfaces to be exposed to view. Do not patch formwork.

### 3.3 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in

accordance with manufacturer's specifications. Do not coat forms for concrete indicated to receive "scored finish". Apply form coatings before placing reinforcing steel.

# 3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Install formed openings for items to be embedded in or passing through concrete work.
- B. Locate and set in place items required to be cast directly into concrete.
- C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install water stops continuous without displacing reinforcement.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- H. Form Ties:
  - 1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
  - 2. Place ties at least 1 inch away from finished surface of concrete.
  - 3. Leave inner rods in concrete when forms are stripped.
  - 4. Space form ties equidistant, symmetrical and aligned vertically and horizontally unless otherwise shown on Drawings.
- I. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- J. Construction Joints:
  - 1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
  - 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
  - 3. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
  - 4. Arrange joints in continuous line straight, true and sharp.
- K. Embedded Items:
  - 1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
  - 2. Do not embed wood or uncoated aluminum in concrete.
  - 3. Obtain installation and setting information for embedded items furnished under other Specification sections.
  - 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
  - 5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.
- L. Openings for Items Passing Through Concrete:

Section 03 10 00-Concrete Forming and Accessories
- 1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
- 2. Coordinate work to avoid cutting and patching of concrete after placement.
- 3. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- M. Screeds:
  - 1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
  - 2. Slope slabs to drain where required or as shown on Drawings.
  - 3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.
- N. Screed Supports:
  - 1. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane.
  - 2. Staking through membrane is not be permitted.
- O. Cleanouts and Access Panels:
  - 1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
  - 2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.

#### 3.5 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

## 3.6 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Engineer.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- D. Leave forms in place for minimum number of days as specified in ACI 347.

#### 3.7 ERECTION TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301.

## 3.8 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
- B. Notify Engineer after placement of reinforcing steel in forms, but prior to placing concrete.
- C. Schedule concrete placement to permit formwork inspection before placing concrete.

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

### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section includes cast-in-place concrete for the following:
  - 1. Tank foundation.
  - 2. Building foundation and slab.
- B. Related Sections:
  - 1. Section 03 10 00 Concrete Forming and Accessories
  - 2. Section 03 39 00 Concrete Curing.

## 1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 301 Specifications for Structural Concrete.
  - 2. ACI 318 Building Code Requirements for Structural Concrete.
- B. ASTM International:
  - 1. ASTM C31/C31M Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - 2. ASTM C33 Standard Specification for Concrete Aggregates.
  - 3. ASTM C39/C39M Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - 4. ASTM C94/C94M Standard Specification for Ready-Mixed Concrete.
  - 5. ASTM C143/C143M Standard Test Method for Slump of Hydraulic Cement Concrete.
  - 6. ASTM C150 Standard Specification for Portland Cement.
  - 7. ASTM C172 Standard Practice for Sampling Freshly Mixed Concrete.
  - 8. ASTM C173/C173M Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
  - 9. ASTM C1107/C1107M Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
  - 10. ASTM C1157 Standard Performance Specification for Hydraulic Cement.
  - 11. ASTM E96/E96M Standard Test Methods for Water Vapor Transmission of Materials.
  - 12. ASTM E1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
  - 13. ASTM E1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

# 1.3 SUBMITTALS

- A. Design Data:
  - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required.
  - 2. Identify mix ingredients and proportions, including admixtures.

# 1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

- B. Acquire cement and aggregate from one source for Work.
- C. Perform Work in accordance with Teller County Building department requirements and Geotechnical Engineering Report recommendations.

### 1.5 COORDINATION

A. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

## PART 2 PRODUCTS

## 2.1 CONCRETE MATERIALS

A. Cement: Per Drawings.

## 2.2 CONCRETE MIX

- A. Select proportions for normal weight concrete in accordance with ACI 301.
- B. Site Mixed Concrete: Mix concrete in accordance with ACI 318.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 30 00 Administrative Requirements: Coordination and project conditions.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

# 3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

### 3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.

#### Section 03 30 00-Cast-In-Place Concrete

- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
- D. Install Barrier Bac VB-250 vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.
- G. Place joint filler in pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- I. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- J. Consolidate concrete.
- K. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- L. Place concrete continuously between predetermined expansion, control, and construction joints.

### 3.4 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed concrete with smooth rubbed finish.
- B. Finish concrete floor surfaces in accordance with ACI 301.
- C. Steel trowel surfaces which are indicated to be exposed.
- D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/4 inch per foot nominal.

### 3.5 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 318.
- B. Provide free access to Work and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- D. Concrete Inspections:
  - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
  - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

E. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

# 3.6 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections in accordance with ACI 301.

## 3.7 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

# 3.8 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Building Foundation: 4,500 psi 28 day concrete.

#### SECTION 03 39 00 - CONCRETE CURING

## PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes initial and final curing of horizontal and vertical concrete surfaces.
- B. Related Sections:
  - 1. Section 03 30 00 Cast-In-Place Concrete.

#### 1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 301 Specifications for Structural Concrete.
  - 2. ACI 302.1 Guide for Concrete Floor and Slab Construction.
  - 3. ACI 308.1 Standard Specification for Curing Concrete.
  - 4. ACI 318 Building Code Requirements for Structural Concrete.
- B. ASTM International:
  - 1. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete.

## 1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

A. Water: Potable, not detrimental to concrete.

### PART 3 EXECUTION

- 3.1 EXAMINATION
  - A. Verify substrate surfaces are ready to be cured.
- 3.2 INSTALLATION HORIZONTAL SURFACES
  - A. Cure concrete in accordance with ACI 308.1.
  - B. Spraying: Spray water over floor slab areas and maintain wet for five (5) days.
- 3.3 INSTALLATION VERTICAL SURFACES
  - A. Cure concrete in accordance with ACI 308.1.
  - B. Spraying: Spray water over surfaces and maintain wet for five (5) days.

### Section 03 39 00-Concrete Curing

# 3.4 PROTECTION OF FINISHED WORK

A. Do not permit traffic over unprotected floor surface.

## SECTION 31 05 13 - SOILS FOR EARTHWORK

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Subsoil materials.
  - 2. Topsoil materials.
- B. Related Sections:
  - 1. Section 31 23 17 Trenching.
  - 2. Section 31 23 23 Fill.

### 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. drop.
- B. ASTM International:
  - 1. ASTM D698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
  - 2. ASTM D2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- 1.3 SUBMITTALS
  - A. Samples: Submit, in air-tight containers, 10 lb sample of each type of fill to independent testing laboratory for analysis.
  - B. Materials Source: Submit name of imported materials source.

# PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Existing Native Material
  - 1. Excavated and re-used material.
  - 2. Graded.
  - 3. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
- B. Structural Import Type 1: CDOT Class 1
- 2.2 SOURCE QUALITY CONTROL
  - A. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698.
  - B. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698.

- C. When tests indicate materials do not meet specified requirements, notify engineer, change material and retest.
- D. Furnish materials of each type from same source throughout the Work.

# PART 3 EXECUTION

## 3.1 EXCAVATION

- A. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.
- B. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.
- C. Remove excess excavated materials, subsoil, and topsoil not intended for reuse, from site.

# 3.2 STOCKPILING

- A. Stockpile materials on site at locations designated by Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Prevent intermixing of soil types or contamination.
- E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

### 3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

# SECTION 31 22 13 - ROUGH GRADING

# PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Excavating topsoil.
  - 2. Excavating subsoil.
  - 3. Cutting, grading, filling, rough contouring, compacting, site for concrete tanks and buildings.
- B. Related Sections:
  - 1. Section 31 05 13 Soils for Earthwork.
  - 2. Section 31 23 16 Excavation.
  - 3. Section 31 23 17 Trenching.

## 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. drop.
- B. ASTM International:
  - 1. ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - 2. ASTM D698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
  - 3. ASTM D2922 Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  - 4. ASTM D3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

# 1.3 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

# 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.
- B. Perform Work in accordance with Teller County Building Department.

# PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Topsoil: Type as specified in Section 31 05 13.
- B. Subsoil Fill: Type as specified in Section 31 05 13.

### Section 31 22 13- Rough Grading

C. Structural Fill: Type as specified in Section 31 05 16.

## PART 3 EXECUTION

- 3.1 EXAMINATION
  - A. Verify survey benchmark(s) and intended elevations for the Work are as indicated on Drawings.

#### 3.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect bench marks, survey control points, and existing structures, from excavating equipment and vehicular traffic.

#### 3.3 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material and cover over with same material, until disposal.
- D. Remove excess topsoil not intended for reuse, from site.

#### 3.4 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, relandscaped, or regraded.
- B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
- C. When excavating through roots, perform Work by hand and cut roots with sharp axe.
- D. Remove excess subsoil not intended for reuse, from site.

#### 3.5 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

- B. Place fill material in continuous layers and compact at a minimum of Geotechnical Engineer's recommendations.
- C. Place material in continuous layers as follows:
  - 1. Subsoil Fill: Maximum 8 inches compacted depth.
  - 2. Structural Fill: Maximum 8 inches compacted depth.
  - 3. Granular Fill: Maximum 8 inches compacted depth.
- D. Maintain moisture content of fill materials -2 to 2% of optimum moisture content to attain required compaction density.
- E. Slope grade away from building minimum 5 percent slope for minimum distance of 10 ft, unless noted otherwise.
- F. Make grade changes gradual. Blend slope into level areas.
- G. Repair or replace items indicated to remain damaged by excavation or filling.

## 3.6 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus  $\frac{1}{2}$  inch from required elevation.
- 3.7 FIELD QUALITY CONTROL
  - A. Perform laboratory material tests in accordance with ASTM D1557.
  - B. Perform in place compaction tests in accordance with the following:
    - 1. Density Tests: ASTM D2922.
    - 2. Moisture Tests: ASTM D3017.
  - C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

## SECTION 31 23 16 - EXCAVATION

## PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Excavating for site structures and buried tanks.
- B. Related Sections:
  - 1. Section 31 22 13 Rough Grading: Topsoil and subsoil removal from site surface.
  - 2. Section 31 23 17 Trenching: Excavating for utility trenches.
  - 3. Section 31 23 23 Fill.

## 1.2 QUALITY ASSURANCE

A. Perform Work in accordance with Teller County Building Department requirements.

#### PART 2 PRODUCTS - Not Used.

#### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.

### 3.2 EXCAVATION

- A. Excavate subsoil to accommodate utilities and construction operations.
- B. Do not interfere with 45 degree bearing splay of foundations.
- C. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- D. Trim excavation. Remove loose matter.
- E. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.
- F. Notify Engineer of unexpected subsurface conditions.
- G. Correct areas over excavated as directed by Engineer.
- H. Remove excess and unsuitable material from site.

I. Repair or replace items indicated to remain damaged by excavation.

# 3.3 FIELD QUALITY CONTROL

- A. Request inspection of excavation and controlled fill operations if required by Teller County Building Department requirements.
- B. Request visual inspection of bearing surfaces by Engineer before installing subsequent work.

## 3.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

## SECTION 31 23 17 - TRENCHING

## PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Excavating trenches for utilities from 5 feet outside building to utility service.
  - 2. Compacted fill from top of utility bedding to subgrade elevations.
  - 3. Backfilling and compaction.

## B. Related Sections:

- 1. Section 31 05 13 Soils for Earthwork: Soils for fill.
- 2. Section 31 22 13 Rough Grading: Topsoil and subsoil removal from site surface.
- 3. Section 31 23 16 Excavation: General building excavation.
- 4. Section 31 23 23 Fill: General backfilling.
- 5. Section 33 11 13 Public Water Utility Distribution Piping.

### 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 457-mm 18-in. drop.
- B. ASTM International:
  - 1. ASTM D698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
  - 2. ASTM D3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- 1.3 **DEFINITIONS** 
  - A. Utility: Any buried pipe, duct, conduit, or cable.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Teller County Building Department requirements.
- 1.5 FIELD MEASUREMENTS
  - A. Verify field measurements prior to fabrication.
- 1.6 COORDINATION
  - A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

# PART 2 PRODUCTS

# 2.1 FILL MATERIALS

A. Native Material or Structural Import Type 1.

# PART 3 EXECUTION

## 3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
  - 1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

## 3.2 PREPARATION

- A. Call Local Utility Line Information service at 811 not less than three working days before performing Work.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.
- D. Protect benchmarks and existing structures from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities indicated to remain.

# 3.3 TRENCHING

- A. Excavate subsoil required for utilities.
- B. Cut trenches to width indicated on Drawings. Remove water or materials that interfere with Work.
- C. Excavate bottom of trenches maximum 2 feet wider than outside diameter of pipe.
- D. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.
- E. Do not interfere with 45 degree bearing splay of foundations.
- F. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- G. Correct over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.

H. Remove excess subsoil not intended for reuse, from site.

# 3.4 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place fill material in continuous layers no thicker than 8 inches and compact to 95% of the material's standard Proctor maximum dry density.
- D. Employ placement method that does not disturb or damage utilities in trench
- E. Maintain moisture content of fill materials -2 to +2% of optimum moisture content to attain required compaction density.
- F. Do not leave more than 10 feet of trench open at end of working day.
- G. Protect open trench to prevent danger to Owner and public.

# 3.5 TOLERANCES

- A. Top Surface of Backfilling: Plus or minus 1/2 inch from required elevations.
- 3.6 FIELD QUALITY CONTROL
  - A. Perform laboratory material tests in accordance with ASTM D1557.
  - B. Perform in place compaction tests in accordance with the following:
    - 1. Density Tests: ASTM D698.
    - 2. Moisture Tests: ASTM D3017.
  - C. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- 3.7 PROTECTION OF FINISHED WORK
  - A. Reshape and re-compact fills subjected to vehicular traffic during construction.

# SECTION 31 23 23 - FILL

## PART 1 GENERAL

#### 1.1 SUMMARY

#### A. Section Includes:

- 1. Backfilling building perimeter to subgrade elevations.
- 2. Backfilling site structures to subgrade elevations.
- 3. Fill under slabs-on-grade.

#### B. Related Sections:

- 1. Section 31 05 13 Soils for Earthwork: Soils for fill.
- 3. Section 31 22 13 Rough Grading: Site filling.
- 4. Section 31 23 16 Excavation.
- 5. Section 31 23 17 Trenching: Backfilling of utility trenches.
- 6. Section 33 11 13 Public Water Utility Distribution Piping.

### 1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 457-mm 18-in. drop.
- B. ASTM International:
  - 1. ASTM D698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
  - 2. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).
  - 3. ASTM D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
  - 4. ASTM D2922 Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

### 1.3 QUALITY ASSURANCE

A. Perform Work in accordance with Teller County Building Department requirements.

### PART 2 PRODUCTS

### 2.1 FILL MATERIALS

- A. Subsoil Fill: Type as specified in Section 31 05 13.
- B. Structural Fill: Type as specified in Section 31 05 13.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 30 00 Administrative Requirements: Coordination and project conditions.
- B. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- C. Verify structural ability of unsupported walls to support loads imposed by fill.

#### 3.2 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural fill and compact to density equal to or greater than requirements for subsequent fill material.
- C. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

## 3.3 BACKFILLING

- A. Backfill areas to contours and elevations with unfrozen materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- C. Place material in continuous layers as follows:
  - 1. Subsoil Fill: Maximum 8 inches compacted depth.
  - 2. Structural Fill: Maximum 8 inches compacted depth.
- D. Employ placement method that does not disturb or damage other work.
- E. Maintain optimum moisture content of backfill materials to attain required compaction density.
- F. Backfill against supported foundation walls. Do not backfill against unsupported foundation walls.
- G. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- H. Make gradual grade changes. Blend slope into level areas.
- I. Remove surplus backfill materials from site.
- J. Leave fill material stockpile areas free of excess fill materials.

#### 3.4 COMPACTION

A. Native Subgrade:

1. Scarified and compacted soils beneath footings, tank bottom, and structural fill. Minimum 95% compaction.

# B. Fill Soils:

- 1. Beneath foundations. Minimum 95% compaction.
- 2. Tank bottom. Minimum 95% compaction.
- 3. Embankments and backfill in non-structural areas. Minimum 90% compaction.

# 3.5 TOLERANCES

- A. Section 01 40 00 Quality Requirements: Tolerances.
- B. Top Surface of Backfilling: Plus or minus 1 inch from required elevations.

# 3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

# 3.7 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 Execution and Closeout Requirements: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic.

## SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Erosion Control Fence.
  - 2. Erosion Control Log.

## B. Related Sections:

- 1. Section 31 05 13 Soils for Earthwork.
- 2. Section 31 10 00 Site Clearing.
- 3. Section 31 23 16 Excavation.
- 4. Section 31 23 23 Fill.

## 1.2 QUALITY ASSURANCE

A. Perform Work in accordance with Drawings and Teller County Building Department requirements.

## PART 2 PRODUCTS

- 2.1 GEOTEXTILE MATERIALS
  - A. Geotextile Fabric: Refer to Drawings.

### PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 30 00 Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify gradients and elevations of base or foundation for other work are correct.
- C. Install Work in accordance with Teller County Building Department requirements.

### 3.2 SITE STABILIZATION

- A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.
- B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
- C. Stockpile and waste pile heights shall not exceed 10 feet. Slope stockpile sides at 2: 1 or flatter.

- D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 20 days.
  - 1. During non-germinating periods, apply mulch at recommended rates.
  - 2. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year.
- E. Stabilize diversion channels, sediment traps, and stockpiles immediately.
- 3.3 FIELD QUALITY CONTROL
  - A. Section 01 40 00 Quality Requirements: Field inspecting, testing, adjusting, and balancing.
  - B. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order within one working day of discovery of any deficiencies.

## 3.4 CLEANING

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for cleaning.
- B. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment off site.
- C. Do not damage structure or device during cleaning operations.
- D. Do not permit sediment to erode into construction or site areas or natural waterways.
- E. Clean channels when depth of sediment reaches approximately one half channel depth.

# SECTION 33 05 07 – TRENCHLESS INSTALLATION OF UTILITY PIPING

# PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Casing and jacking pipe.
  - 2. Steel tunnel liner.
  - 3. Carrier pipe.
  - 4. Excavation for approach trenches and pits.
- B. Related Requirements:
  - 1. Section 31 23 16 Excavation: Dewatering measures and excavation supports.
  - 2. Section 31 23 23 Fill: Compaction requirements.
  - 3. Section 33 11 13 Public Water Utility Distribution Piping: Piping and carrier pipe requirements.

## 1.2 UNT PRICE - MEASUREMENT AND PAYMENT

- A. Section 01 20 00 Price and Payment Procedures: Contract Sum/Price modification procedures.
- B. [Jacked Pipe] [Tunnel]:
  - 1. Basis of Measurement: By linear [foot] <\_\_\_\_>, measured on invert of [jacked pipe] [tunnel] from face of [jacked pipe] [tunnel].
  - 2. Basis of Payment: Includes excavation, [jacked pipe] [tunnel], [carrier pipe] [duct], grout, accessories, tests, and backfill.

# 1.3 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO HB-17 Standard Specifications for Highway Bridges.
  - 2. AASHTO M133 Standard Specification for Preservatives and Pressure Treatment Processes for Timber.
  - 3. AASHTO T 180 Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. drop.
- B. American Railway Engineering and Maintenance-of-Way Association:
  - 1. AREMA Manual for Railway Engineering.
- C. American Welding Society:
  - 1. AWS D1.1/.

- D. ASTM International:
  - 1. ASTM A36/A.
  - 2. ASTM A53/.
  - 3. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
  - 4. ASTM A449 Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
  - 5. ASTM A1011/.
  - 6. ASTM C33/.
  - 7. ASTM C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
  - 8. ASTM C150/.
  - 9. ASTM C361 Standard Specification for Reinforced Concrete Low-Head Pressure Pipe.
  - 10. ASTM C404 Standard Specification for Aggregates for Masonry Grout.
  - 11. ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
  - 12. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3).
  - 13. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3).
  - 14. ASTM D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- E. National Utility Contractors Association:
  - 1. NUCA Guide to Pipe Jacking and Microtunneling Design.

# 1.4 COORDINATION

- A. Section 01 30 00 Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with [State] [Municipality] of <\_\_\_\_> [Highways] [Public Works] and utilities within construction area.

# 1.5 PREINSTALLATION MEETINGS

- A. Section 01 30 00 Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum [one week] [<\_\_\_\_> weeks] prior to commencing Work of this Section.

# 1.6 SUBMITTALS

- A. Section 01 33 00 Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information regarding tunnel liner plate, showing sizes, shapes, methods of attachment, connection details, and details of grout holes.
- C. Shop Drawings:

Section 31 05 07- Trenchless Installation of Utility Piping

- 1. Indicate details of casing, jacking head, sheeting, and other falsework for trenches and pits, and support for **[facility]<\_\_\_\_\_>**, field sketches, and other details to complete Work.
- 2. Indicate relationship of proposed installation to **[facility] [natural features]** over installation, angle of installation, right-of-way lines, and general layout of built facilities.
- 3. Indicate cross-section(s) from field survey, showing installation in relation to actual profile of **[ground] [facility]**.
- 4. Submit description of proposed construction plan, dewatering plan, and plan to establish and maintain vertical and horizontal alignments.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- F. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations and assumptions for tunnel liner.
- G. Submit [State] [Municipality] of <\_\_\_\_> [Highways] [Public Works] occupancy permit for installations [along] [under] public throughways and lands.
- H. Submit emergency response procedures to handle situations when conduit is compromised and jeopardizes safety or integrity of installation.
- I. Submit written report results of **[visual check]**<\_\_\_\_> of entire length of **[casing] [liner]** prior to installation of **[carrier] [concrete invert]** to verify that there are no voids or defective joints.
- J. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- K. Qualifications Statements:
  - 1. Submit qualifications for installer and licensed professional.
  - 2. Welders: Qualify procedures and personnel according to AWS D1.1/D1.1M.

# 1.7 SUSTAINABLE DESIGN SUBMITTALS

- A. Section 01 81 13 Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate:
  - 1. Certify that products meet or exceed specified sustainable design requirements.
  - 2. Materials Resources Certificates:
    - a. Certify source and origin for **[salvaged] [and] [reused]** products.
    - b. Certify recycled material content for recycled content products.
    - c. Certify source for regional materials and distance from Project Site.
- C. Product Cost Data:
  - 1. Submit cost of products to verify compliance with Project sustainable design requirements.

- 2. Exclude cost of labor and equipment to install products.
- 3. Provide cost data for following products:
  - a. Salvaged, refurbished, and reused products.
  - b. Products with recycled material content.
  - c. Regional products.
  - d. Certified wood products.
  - e. <\_\_\_\_>.

## 1.8 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of casing or tunnel liner, carrier pipe, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

## 1.9 QUALITY ASSURANCE

- A. Perform Work according to AREMA, NUCA, and <\_\_\_\_> guidelines.
- B. Obtain occupancy permit when boring, jacking, or tunneling under or within rights-of-way of **[state] [municipal]** highways and railroads.
- C. Perform Work according to <\_\_\_\_> standards.
- D. Maintain <\_\_\_\_\_> [copy] [copies] of each standard affecting Work of this Section on Site.

# 1.10 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum [three]<\_\_\_\_\_> years' [documented] experience [and approved by manufacturer].
- B. Welders: AWS qualified within previous 12 months for employed weld types.
- C. Licensed Professional: [Professional engineer]<\_\_\_\_> experienced in design of specified Work and licensed [at Project location] [in State of <\_\_\_\_\_>].

# 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Handling: Support casing and carrier pipes with nylon slings during handling.

Section 31 05 07- Trenchless Installation of Utility Piping

- D. Storage:
  - 1. Store products according to manufacturer instructions.
  - 2. Use wooden shipping braces between layers of stacked pipe.
  - 3. Stack piping lengths no more than three layers high.
  - 4. Store field joint materials in original shipping containers.

## E. Protection:

- 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
- 2. Provide temporary end caps and closures on piping and fittings and maintain in place until installation.
- 3. Protect piping **[system pieces] [systems]** from entry of foreign materials and water by installing temporary covers, completing sections of Work, and isolating parts of completed system.
- 4. Provide additional protection according to manufacturer instructions.

## 1.12 AMBIENT CONDITIONS

- A. Section 015000 Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Storage Temperature: Maintain 60 to 85 degrees F.

### 1.13 EXISTING CONDITIONS

- A. Field Measurements:
  - 1. Verify field measurements prior to fabrication.
  - 2. Indicate field measurements on Shop Drawings.

# PART 2 - PRODUCTS

# 2.1 CASING AND JACKING PIPE

- A. <u>Manufacturers:</u>
  - 1. <u>Pipe Industries Corporation.</u>
  - 2. <u>Southland Pipe & Supply Co.</u>
  - 3. <u>Valiant Steel and Equipment, Inc.</u>
  - 4. Substitutions: [As specified in Section 016000 Product Requirements] [Not permitted].
  - 5. Furnish materials according to <\_\_\_\_> standards.
- B. Steel Casing Pipe:
  - 1. Comply with ASTM A53/A53M.

- 2. Minimum Yield Strength: [35,000] [42,000] psi.
- 3. Minimum Wall Thickness: 0.375 inch.
- 4. Welded Joints:
  - a. Comply with AWS D1.1/D1.1M.
  - b. Full circumference.

# C. Concrete Casing Pipe:

- 1. Pipe:
  - a. Comply with ASTM [C76] [C361], Class V wall.
  - b. Loading: Type C.
  - c. Type: [Reinforced] [Nonreinforced].
- 2. Joints:
  - a. Comply with ASTM C443.
  - b. Joints: Butt.
  - c. Collar Bands: [Steel] [or] [fiberglass-reinforced pipe].
  - d. Sealing Ring: Elastomeric material.
- D. Performance and Design Criteria:
  - 1. Casing Pipe and Tunnel Liner: Leakproof.
  - 2. Loading:
    - a. Highways:
      - 1) Earth cover.
      - 2) H-20 live loading, according to AASHTO HB-17.
      - 3) Impact loading according to AASHTO HB-17 [plus 50 percent].
    - b. Railways:
      - 1) Earth cover.
      - 2) Comply with AREMA Manual for Railway Engineering.
      - 3) Impact loading according to AREMA guidelines [plus 50 percent].
  - 3. Bracing, Backstops, and Jacks: Of sufficient rating for continuous jacking without stopping except to add pipe sections, and to minimize tendency of ground material to freeze around casing pipe.

# 2.2 STEEL TUNNEL LINER

- A. Comply with AREMA guidelines.
- B. Plates:
  - 1. Material: Structural steel.
  - 2. Comply with ASTM A1011/A1011M.

- 3. Minimum Grade: 40.
- C. Bolts and Nuts Used with Lapped Seams:
  - 1. Minimum Diameter: 5/8 inch.
  - 2. Bolts for Plate Thicknesses Greater Than or Equal to 0.209 Inches: Comply with ASTM A449.
  - 3. Bolts for Plate Thicknesses Less Than 0.209 Inches: Comply with ASTM A307, Grade A.
  - 4. Nuts: Comply with ASTM A307, Grade A.
- D. Bolts and Nuts Used with Four-Flanged Plates:
  - 1. Comply with ASTM A307, Grade A.
  - 2. Thread: Coarse.
  - 3. Diameter:
    - a. Plate Thicknesses up to and Including 0.179 Inch: Minimum 1/2 inch.
    - b. Plate Thicknesses Greater Than 0.179 Inch: Minimum 5/8 inch.

# 2.3 CARRIER PIPE

A. Site Water Distribution System Piping: As specified in Section [331416 - Site Water Utility Distribution Piping]<\_\_\_\_\_>.

# 2.4 MATERIALS

- A. Soil Backfill for Trench Approaches and Pits to Finish Grade:

  - 2. Subsoil with no rocks 6 inches in diameter or greater, frozen earth, or foreign matter.
- B. Filling and Sealing Grout at Pipe Ends: Concrete grout fill as specified in Section [036000 Grouting]<\_\_\_\_\_>.
- C. Pressure-Grout Mix: One part portland cement and six parts mortar sand, mixed with water to consistency applicable for pressure grouting.
- D. Mortar Sand: Comply with [ASTM C33/C33M] [ASTM C404]<\_\_\_\_>.
- E. Portland Cement:
  - 1. Comply with [ASTM C150/C150M]<\_\_\_\_>.
  - 2. Type: **[I] [V]**<\_\_\_\_>.

# 2.5 ACCESSORIES

A. Timber Supports and Insulators:

- 1. Description:
  - a. Furnish notches to accommodate fastening.
  - b. Treat notches at time of pipe installation.
- 2. Wood Preservative or Pressure Treatment: [Creosote; AASHTO M133]<\_\_\_\_>.
- 3. Species: [Redwood]<\_\_\_\_>.
- B. Steel and Plastic Supports and Insulators:
  - 1. Bands: [14-gage stainless steel] [Polyethylene].
  - 2. Flange Bolts: 5/16-inch stainless steel.
  - 3. Liner: Heavy-duty PVC.
  - 4. Skids: [Polyethylene] [or] [phenolic].
- C. Steel Strapping: Comply with ASTM A36/A36M.
- D. Tunnel Liner Coating: [Zinc] [Bituminous].

# 2.6 FABRICATION - STEEL TUNNEL LINER

- A. Description: Fabricate plates to fit cross-section of tunnel and for connection by bolts on both longitudinal and circumferential seams or joints for erection from inside.
- B. Grout Holes:
  - 1. Description: To permit grouting as erection of liner plates progresses.
  - 2. Diameter: [2 inches] [As indicated on Drawings].
- C. Plates:
  - 1. Cold-form plates to provide pattern of corrugations or panels in skin section, which, along with circumferential flanges, develop effective sectional properties as shown in AREMA guidelines.
  - 2. Width: [16] [18] <\_\_\_\_> inches.
  - 3. Length: Adequate to obtain circumferential wall coverage in two or more multiples equivalent to 6, 12, 14, or 16 inches of diameter.
  - 4. Maximum Weight of Single Plate without Bolts: 90 lb..
- D. Plate Joints:
  - 1. Description:
    - a. Drill plates for bolting on both longitudinal and circumferential seams or joints.
    - b. Fabricate to permit complete erection from inside.
  - 2. Circumferential Flanges: Furnish bolt spacing not greater than 9-1/2 inches center-tocenter and in multiples of plate length such that plates having same curvature are interchangeable and to permit staggering of longitudinal seams.
  - 3. Longitudinal Flanges:

- Four-Flanged Plates: Three bolts in 16 inches of plate width. a.
- Two-Flanged Plates: Four bolts per foot in lapped seams. b.
- E. Coatings:
  - 1.
  - Galvanized Liner Plates: <\_\_\_\_>. Bituminous Coating: <\_\_\_\_>. 2.

# **PART 3 - EXECUTION**

#### 3.1 **EXAMINATION**

- Section 01 70 00 Execution and Closeout Requirements: Requirements for installation Α. examination.
- B. Verify that connection [to existing piping system] <\_\_\_\_\_>, sizes, locations, and invert elevations are as indicated on [Shop] Drawings.

#### 3.2 PREPARATION

- Section 01 70 00 Execution and Closeout Requirements: Requirements for installation Α. preparation.
- Identify required lines, levels, contours, and datum locations. B.
- C. **Existing Utilities:** 
  - 1. Locate and identify utilities indicated to remain and protect from damage.
  - 2. Notify **[utility company]<\_\_\_\_\_>** to remove **[and relocate]** utilities.
  - Establish minimum separation of <\_\_\_\_\_> from [other services] [sanitary sewage piping]<\_\_\_\_\_> according to [<\_\_\_\_\_> code]<\_\_\_\_>. 3.
- Establish elevations of **[casing] [tunnel]** with not less than < > feet of cover. D.
- Maintain access to existing [facilities]<\_\_\_\_> and other active installations requiring access. E.

#### 3.3 **INSTALLATION**

- Dewatering: А.
  - As specified in Section [312316 Excavation] [312316.13 Trenching]<\_\_\_\_\_-1.
  - Intercept and divert surface drainage precipitation and ground water away from excavation 2. through use of dikes, curb walls, ditches, pipes, sumps, or other methods.
  - Develop substantially dry subgrade for subsequent operations. 3.
  - Comply with requirements of local and state authorities for dewatering to any watercourse, 4. prevention of stream degradation, and erosion and sediment control.

>.

- B. Pits or Approach Trenches:
  - 1. Excavate approach trenches or pits [according to installation plan] [, as indicated on Shop Drawings] [, and] as Site conditions require.
  - 2. Ensure that **[casing] [tunnel]** entrance faces as near perpendicular in alignment as conditions permit.
  - 3. Establish vertical entrance face at least 1 foot above top of [casing] [tunnel lining].
  - 4. Install excavation supports as specified in Section [312316 Excavation] [312316.13 Trenching]<\_\_\_\_\_>.
- C. Casing Pipe:
  - 1. Boring:
    - a. Push pipe into ground with boring auger rotating within pipe to remove soil.
    - b. Do not advance cutting head ahead of casing pipe, except for distance necessary to permit cutting teeth to maintain clearance for pipe.
    - c. Arrange machine bore and cutting head to be removable from within pipe.
    - d. Arrange face of cutting head to provide barrier to free flow of soft material.
    - e. If unstable soil is encountered during boring, retract cutting head into casing to permit balance between pushing pressure and ratio of pipe advancement to quantity of soil.
    - f. Grout to fill voids if voids develop greater than OD of pipe by approximately 1 inch.
    - g. If boring is obstructed, relocate jack or tunnel as directed by Architect/Engineer.
  - 2. Jacking:
    - a. Construct adequate thrust wall normal to proposed line of thrust.
    - b. Impart thrust load to pipe through suitable thrust ring sufficiently rigid to ensure uniform distribution of thrust load on full pipe circumference.
  - 3. Drilling and Jacking:
    - a. Use oil-field-type rock roller bit or plate bit made up of individual roller cutter units solidly welded to pipe.
    - b. Turned and push pipe for its entire length by drilling machine to give bit necessary cutting action.
    - c. Inject high-density slurry (oil field drilling mud) to head as cutter lubricant.
    - d. Inject slurry at rear of cutter units to prevent jetting action ahead of pipe.
  - 4. Mining and Jacking: Use manual hand-mining excavation from within casing pipe as casing is advanced with jacks, allowing minimum ground standup time ahead of casing pipe.
- D. Tunneling:
  - 1. Liner Plates:
    - a. Advance excavation for tunnel lining in increments sufficient for erection of one ring of liners.
    - b. Install liner plates immediately after each increment of excavation.

- c. Excavate to minimize voids behind liner plates.
- d. Force-grout voids immediately, using pressure as necessary to completely fill voids.
- 2. Excavate to lines, grades, dimensions, and tolerances as indicated on Drawings to accommodate initial support and permanent lining.
- 3. Tunnel Linings:
  - a. Do not damage lining or coating.
  - b. Ensure that edges are clean and free of material capable of interfering with proper bearing.
  - c. Install liner plates and bolts according to liner plate manufacturer instructions, and replace liner plates or bolts not meeting these requirements.
  - d. Use liner plates for full length of tunnel of one type only, using either flanged or lapped-seam type of construction.
- 4. Place concrete invert.
- E. Pressure Grouting: Pressure-grout annular space between casing pipe and surrounding earth.
- F. Carrier Pipe:
  - 1. Clean, inspect, and handle pipe as specified in Section [337119 Electrical Underground Ducts, Ductbanks, and Manholes] [335213 - Fuel-Oil Distribution] [336100 -Hydronic Energy Distribution] [336300 - Steam Energy Distribution] [331416 - Site Water Utility Distribution Piping] [333100 - Sanitary Sewerage Piping] [334213 -Stormwater Culverts] [334200 - Stormwater Conveyance].
  - 2. Placement:
    - Place carrier pipe as specified in Section [337119 Electrical Underground Ducts, Ductbanks, and Manholes] [335213 - Fuel-Oil Distribution] [336100 - Hydronic Energy Distribution] [336300 - Steam Energy Distribution] [331416 - Site Water Utility Distribution Piping] [333100 - Sanitary Sewerage Piping] [334213 - Stormwater Culverts] [334200 - Stormwater Conveyance].
    - b. Prevent damage to pipe joints as carrier pipe is placed in casing.
  - 3. Supports:
    - a. Support pipeline within casing such that no external loads are transmitted to carrier pipe.
    - b. Attach supports to barrel of carrier pipe; do not rest carrier pipe on bells.
  - 4. Grout ends of casing to seal.

# 3.4 TOLERANCES

- A. Section 0140 00 Quality Requirements: Requirements for tolerances.
- B. Excavation: Do not overcut excavation by more than 1 inch greater than OD of casing pipe.

- C. Casing Pipe Vertical and Horizontal Alignment: Plus or minus 3 inches prior to installation of carrier pipe.
- D. Pipe Bells: Minimum 1/2-inch clearance to casing.
- 3.5 FIELD QUALITY CONTROL
  - A. Section 01 40 00 Quality Requirements: Requirements for inspecting and testing.
  - B. Section 01 70 00 Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
  - C. Compaction Testing:
    - 1. Comply with [ASTM D1557] [ASTM D698] [ASTM D6938] [AASHTO T 180].
    - 2. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.
    - 3. Testing Frequency: <\_\_\_\_>.
  - D. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than < \_\_\_\_\_ > [days] [hours] on Site for technical assistance during following periods of [casing] [tunnel] installation:
    - 1. Unloading of [casing] [tunnel] materials and components.
    - 2. Prior to commencing excavation and during excavation.

# 3.6 CLEANING

- A. Section 017000 Execution and Closeout Requirements: Requirements for cleaning.
- B. Remove temporary facilities for [casing] [tunnel] installation and [jacking] [tunneling] operations as specified in Section [015000 Temporary Facilities and Controls]<\_\_\_\_\_>.

# 3.7 **PROTECTION**

- A. Section 017000 Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect plant life, lawns, **[rock outcroppings,]** and other features of final landscaping.
- C. Protect bench marks, survey control points, **[existing structures,] [fences,] [sidewalks,]** [paving,] [and] [curbs] from excavating equipment and vehicular traffic.

# SECTION 33 11 12 – POTABLE WATER SUPPLY WELLS

# PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Drilling and casing of water well.
  - 2. Pump and controller.
  - 3. Hydropneumatic tanks.
  - 4. Water and system testing and certification.
- B. Related Requirements:
  - 1. Section 31 23 16 Excavation: Excavating for conduit and pipe from well head to building.
  - 2. Section 31 23 16.13 Trenching: Backfilling and excavating for conduit and pipe from well head to building.
  - 3. Section 31 23 23 Fill: Backfilling for conduit and pipe from well head to building.

## 1.2 DEFINITIONS

A. Suspended Solids: Small solid particles that do not dissolve in water.

# 1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Section 01 20 00 Price and Payment Procedures: Contract Sum/Price modification procedures.
- B. Water Well:
  - 1. Basis of Measurement: By vertical **[foot]** < \_\_\_\_\_ > of well depth.
  - 2. Basis of Payment: Includes drilling, casing, backfilling, pump test, and water quantity [and water quality] tests.
- C. Grouting:
  - 1. Basis of Measurement: By cubic foot.
  - 2. Basis of Payment: Includes materials and placement of grout.
- D. Pump:
  - 1. Basis of Measurement: By each.
  - 2. Basis of Payment: Includes pump controller, motor drive, fittings, sensor, and accessories; conduit, wire, pipe, and pipe fittings from well to water storage tank; accessories; and pump.
## 1.4 REFERENCE STANDARDS

- A. American Society of Mechanical Engineers:
  - 1. ASME Boiler and Pressure Vessel Code Section VIII Rules for Construction of Pressure Vessels Division 1.
- B. ASTM International:
  - 1. ASTM A53/.
  - 2. ASTM C150/C150M Standard Specification for Portland Cement.
  - 3. ASTM D2241 Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
- C. American Water Works Association:
  - 1. AWWA A100 Water Wells.
  - 2. AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution.
- D. National Electrical Manufacturers Association:
  - 1. NEMA MG 1 Motors and Generators.
  - 2. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).

## 1.5 PREINSTALLATION MEETINGS

- A. Section 01 30 00 Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

## 1.6 SUBMITTALS

- A. Section 01 33 00 Submittal Procedures: Requirements for submittals.
- B. Product Data:
  - 1. Submit manufacturer information regarding well pump and controller, including rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
  - 2. Submit manufacturer information regarding well casing.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions:
  - 1. Submit detailed instructions on installation requirements, including storage and handling procedures.
  - 2. Indicate rigging and assembly.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

- F. Qualifications Statements:
  - 1. Submit qualifications for manufacturer and drilling firm.

## 1.7 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of well, depth, subsoil strata, and drilling difficulties encountered.
- C. Submit signed copy of driller's logbook statements.
- D. Submit executed certification of well pump after performance testing.
- E. Submit documents required by Colorado Department of Natural Resources.

## 1.8 QUALITY ASSURANCE

A. Perform Work according to AWWA A100.

## 1.9 QUALIFICATIONS

A. Drilling Firm: Company specializing in performing Work of this Section with minimum 3 years' experience and licensed.

## 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
  - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
  - 2. Provide additional protection according to manufacturer instructions.

# PART 2 - PRODUCTS

## 2.1 SYSTEM DESCRIPTION

A. Water well with following characteristics:

## Section 33 11 12- Potable Water Supply Wells

- Minimum Water Production: <\_\_\_\_> gpm. 1.
- Upper Drill Hole: <\_\_\_\_\_>-inch diameter and <\_\_\_\_\_> feet deep. 2.
- Lower Drill Hole: <\_\_\_\_\_>-inch diameter and <\_\_\_\_\_> feet deep. Casing Size: <\_\_\_\_\_>-inch ID and <\_\_\_\_> feet deep. Grout Seal Depth: <\_\_\_\_\_> feet. 3.
- 4.
- 5.
- Total Well Depth: <\_\_\_\_\_> feet. 6.
- 7. Pump Depth: < > feet.
- B. Performance and Design Criteria:
  - Maximum Suspended Solids in Delivered Water: <\_\_\_\_> mg/L. Maximum Settleable Solids in Delivered Water: <\_\_\_\_> ppm. 1.
  - 2.
  - 3. Well Pump:
    - Design Flow Rate: <\_\_\_\_> gpm. a.
    - b.
    - Design Flow Total Dynamic Head: <\_\_\_\_> feet. Minimum Efficiency at Design Flow Rate: <\_\_\_\_> percent. c.
    - Maximum Flow Rate: <\_\_\_\_> gpm. d.
    - Maximum Flow Total Dynamic Head: < > feet. e.
    - Minimum Efficiency at Maximum Flow Rate: <\_\_\_\_> percent. Net Positive Suction Head Available: <\_\_\_\_> feet. f.
    - g.
    - Maximum Pump Speed: < \_\_\_\_ > rpm. Maximum Motor Speed: < \_\_\_\_ > rpm. h.
    - i.

#### 2.2 WELL PUMPS

- Α. Manufacturers:
  - Gorman-Rupp Company (The). 1.
  - Goulds Water Technology; a Xylem brand. 2.
  - Grundfos Pumps Corporation U.S.A. 3.
  - Or Approved Equal 4.
- B. Description:
  - 1. Type: Close-coupled, multi-stage submersible.
  - 2. Lubrication: [Water lubricated] [Oil filled].
  - 3. Shaft: Vertical.
  - 4. Suitable for insertion in [3-inch] [4-inch] [5-inch] [6-inch] diameter pipe.
- C. Casing:
  - 1. Casting: [Cast iron] [Bronze].
  - 2. Housing and Intake Screen: Stainless steel.
  - Check Valve: Stainless-steel stem and valve seat with rubber seal built into discharge 3. casting.
- D. Impellers and Diffusers: [Bronze] [Glass-reinforced thermoplastic with stainless-steel wear **rings**]<\_\_\_\_>.

- E. Shaft and Sleeve: Stainless steel.
- Operation: F.
  - 1. **Electrical Characteristics:** 
    - As specified in Section 260583 Wiring Connections. a.
    - [<\_\_\_\_> hp] [<\_\_\_\_> RLA]. b.
    - Voltage: < >V, [single] [three] phase, 60 Hz. c.
    - Maximum [Fuse Size] [Circuit Breaker Size] [Overcurrent Protection]: d. < >A.
    - e.
    - Minimum Circuit Ampacity: <\_\_\_\_\_>.

       Minimum Power Factor: <\_\_\_\_\_> percent at rated load.

      f.
  - 2. Motors:
    - As specified in Section 220513 Common Motor Requirements for Plumbing a. Equipment.
    - NEMA MG 1 submersible type. b.
  - 3. Pump Controller:
    - NEMA 250 Type [1] [3R] < > enclosure with main disconnect interlocked a. with door.
    - Single-point power connection and grounding lug. b.
    - Across-the-line electric motor starter with starting relay [and ambient compensate c. quick trip overloads in each phase with manual trip button and reset button].
    - Circuit breaker. d.
    - Control transformer. e.
    - HAND-OFF-AUTO selector switches. f.
    - Pilot lights. g.
  - 4. Pressure-Sensing Switch:
    - Type: Low-voltage relay. a.
    - b. Settings:
      - 1) [Fixed] [Adjustable].
      - Start pump at [20] [30] < > psig and de-energize pump at [40] [50] 2) <\_\_\_\_> psig.
      - [Low pressure cutoff set at 20 psig] [Low pressure cutoff set at 3) <\_\_\_\_> psig].
  - 5. Control Voltage: [120 V ac] [24 V dc]<\_\_\_\_>.
- Pump Lift Cable: G.
  - Description: Stainless-steel, multi-stranded aircraft cable with high tensile strength. 1.
  - 2. Cable Ends: Fitted with closed loop fittings.
  - 3. Length: Depth of shaft plus [20] < \_\_\_\_ > feet.

H. Screen Material: [Stainless steel]<\_\_\_\_>.

# 2.3 WELL CASINGS

- A. Description:
  - 1. Material:
    - a. Schedule [40] [80] galvanized-steel pipe.
    - b. Comply with ASTM A53/A53M, Grade [A] [B].
  - 2. Nominal Internal Diameter: [3] [4] [5] [6] <\_\_\_\_> inches.
  - 3. Accessories: Pitless adaptor and ventilated well cap.
- B. Description:
  - 1. Material:
    - a. Schedule [40] [80] PVC.
    - b. Comply with AWWA C900.
  - 2. Material:
    - a. PVC, SDR [21]<\_\_\_\_>.
    - b. Comply with ASTM D2241.
  - 3. Nominal Internal Diameter: [3 inches] [4 inches] [5 inches] [6 inches].
  - 4. Accessories: Pitless adaptor and ventilated well cap.

# 2.4 WELL SCREENS

- A. Description:
  - 1. Configuration: Continuous slot; wire wound.
  - 2. Circumferentially wrap triangularly shaped wire around circular array of rods or perforated channels.
  - 3. Wire configuration to produce inlet slots with sharp outer edges, widening inwardly to minimize clogging.
  - 4. Material: [Type <\_\_\_\_> stainless steel] [PVC]<\_\_\_\_>.

# 2.5 MATERIALS

- A. Filter Packs:
  - 1. Description: Clean, well rounded, smooth, and uniform; mostly grains.
  - 2. Material:
    - a. Siliceous.
    - b. Calcareous Material: Not more than 5 percent by weight.

- c. Minimum Specific Gravity: 2.5.
- 3. Grading:
  - a. Determination: From sieve analyses of aquifer materials.
  - b. Passing Size: Four to six times thirty-percent passing size of aquifer sample having finest grain-size distribution.
- 4. Minimum Uniformity Coefficient: 2.5.

## 2.6 MIXES

- A. Grout:
  - 1. Type:
    - a. Portland cement.
    - b. Comply with ASTM C150/C150M, Type 1.
  - 2. Mixture: Not more than 5 gal. of water per 94-lb. bag of cement.
  - 3. Obtain approval of [Architect/Engineer]<\_\_\_\_> to use bentonite or other additives, up to 6 percent by weight of cement, to reduce shrinkage permeability, increase fluidity, or control setting time.
- B. Grout: Mixture of bentonite clay with minimum amount of clean water required to facilitate placement.

# 2.7 ACCESSORIES

- A. Pitless Adapters:
  - 1. <u>Manufacturers:</u>
    - a. <u>Flint & Walling; Zoeller Company.</u>
    - b. <u>Merrill Manufacturing.</u>
    - c. <u>Pentair Water.</u>
    - d. Substitutions: [As specified in Section 016000 Product Requirements] [Not permitted].
    - e. Furnish materials according to <\_\_\_\_> standards.
  - 2. Description: Two-piece bronze.
- B. Well Seals:
  - 1. <u>Manufacturers:</u>
    - a. <u>Campbell Manufacturing, Inc.</u>
    - b. <u>Merrill Manufacturing.</u>
    - c. <u>Simmons Manufacturing Co.</u>

- Substitutions: [As specified in Section 016000 Product Requirements] [Not d. permitted].
- Furnish materials according to <\_\_\_\_> standards. e.
- 2. Materials:
  - a. Plate: Painted cast iron.
  - Seal: Molded rubber. b.
  - Bolts and Nuts: Zinc-plated steel. c.
- С. Well Caps:
  - 1. Manufacturers:
    - Campbell Manufacturing, Inc. a.
    - Merrill Manufacturing. b.
    - Simmons Manufacturing Co. c.
    - Substitutions: [As specified in Section 016000 Product Requirements] [Not d. permitted].
    - Furnish materials according to < > standards. e.
  - 2. Description: Watertight, lockable.
  - 3. Material: [Cast iron] [ABS] [Aluminum] [Aluminum/ABS].
- **Riser Pipes:** D.
  - Schedule [40]<\_\_\_\_> threaded [steel] pipe. Nominal Diameter: <\_\_\_\_> inches. 1.
  - 2.
- E. Cable Ties: [Threaded plastic strap]<\_\_\_\_>.

# PART 3 - EXECUTION

#### 3.1 **EXAMINATION**

- Section 01 70 00 Execution and Closeout Requirements: Requirements for installation A. examination.
- B. Verify that Site conditions are capable of supporting equipment for performing drilling operations and testing.

#### 3.2 PREPARATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Protect structures near well from damage.

#### 3.3 **INSTALLATION**

- Drilling: А.
  - 1. Drilling Equipment: [Reverse] [Direct] [Air] rotary.
  - Drill concentric well shaft to diameters and depths as [indicated on Drawings] [required 2. to meet performance criteria].
  - Remove loose material from shaft bottom. 3.
  - Allow inspection of casing prior to placement of grout. 4.
  - 5. Place grout tight to surrounding Work according to [regulatory requirements < >.
  - 6. Shaft Top:
    - Cut off shaft top [24] < \_\_\_\_\_> inches above [grade] < \_\_\_\_\_>. a.
    - Prevent metal cuttings from entering casing. b.
  - Record accurate log of materials penetrated to determine depths and thicknesses of 7. underlying formations.
  - Prepare electric log recording resistivity, spontaneous potential, and gamma for total depth 8. of borehole.
  - 9. Record caliper, temperature, fluid conductivity, and optical or acoustic televiewer logs to total depth of borehole.
  - Casing and Screen: 10.
    - Place well casing and screen assembly immediately after drilling. a.
    - Keep casing and screen under tension during filter packing. b.
  - 11. Install filter packing.
  - Test borehole for plumbness according to [AWWA A100]<\_\_\_\_>. 12.
  - Remove loose material from shaft bottom. 13.
  - Maintain well opening and casing free of contaminating materials. 14.
- Disinfection: Disinfect well [as specified in Section 330110.58 Disinfection of Water Utility B. Piping Systems < >.
- С. Installation Standards: Install Work according to < > standards.
- Well Pump: D.
  - Electrical Connections: As specified in Section [260583 Wiring Connections] < \_\_\_\_\_-1.
  - >. Secure pump lifting cable to pump. 2.
  - Install pump onto threaded riser pipe. 3.
  - 4.
  - Set pump intake <\_\_\_\_\_> feet below [finished] [existing] grade. Secure wiring harness to pump column at <\_\_\_\_\_>-foot intervals. 5.
  - Install pitless adapter to set pump discharge at < > feet below [finished] 6. [existing] grade.
  - Install pump column < > feet above [finished] [existing] grade with well seal 7. between pump column and well casing.

# 3.4 TOLERANCES

- A. Section 01 40 00 Quality Requirements: Requirements for tolerances.
- B. Maximum Variation From Plumb: [Comply with AWWA A100] [1/2 inch] [<\_\_\_\_> inch] [Not to exceed 2/3 of casing diameter per 100 feet of well depth].
- C. Maximum Offset From Indicated Alignment: [1] <\_\_\_\_> inch.
- 3.5 FIELD QUALITY CONTROL
  - A. Section 01 40 00 Quality Requirements: Requirements for inspecting and testing.
  - B. Section 01 70 00 Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
  - C. Performance Testing:
    - 1. Notify Engineer at least three days prior to flow-rate testing.
    - 2. Test flow rate and certify.
    - 3. Water Quantity: <\_\_\_\_>.
    - 4. Water Quality: <\_\_\_\_>.
    - 5. Sand Content: <\_\_\_\_>.
  - D. Acceptance: Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

## SECTION 33 11 13 - PUBLIC WATER UTILITY DISTRIBUTION PIPING

#### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Pipe and fittings for public line, including potable water line and site distribution.
  - 2. Underground pipe markers.
  - 3. Pipe support systems.
  - 4. Bedding and cover materials.
- B. Related Requirements:
  - 1. Section 03 30 00 Cast-in-Place Concrete: Concrete for thrust restraints.
  - 2. Section 31 05 13 Soils for Earthwork: Soils for backfill in trenches.
  - 3. Section 31 23 16 Excavation: Product and execution requirements for excavation and backfill required by this Section.
  - 4. Section 31 23 17 Trenching: Execution requirements for trenching required by this Section.
  - 5. Section 31 23 23 Fill: Requirements for backfill to be placed by this Section.
  - 6. Section 33 13 00 Disinfecting of Water Utility Distribution: Disinfection of water piping.

#### 1.2 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T 180 Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 457-mm 18-in. drop.
- B. American Society of Mechanical Engineers:
  - 1. ASME B16.1 Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
- C.American Water Works Association:
  - 1. AWWA C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
  - 2. AWWA C110 Ductile-Iron and Gray-Iron Fittings.
  - 3. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - 4. AWWA C115 Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
  - 5. AWWA C151 Ductile-Iron Pipe, Centrifugally Cast.
  - 6. AWWA C153 Ductile-Iron Compact Fittings.
  - 7. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances.
  - 8. AWWA C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.

## **1.3 SUBMITTALS**

- A. Submittals required to verify compliance with Project requirements.
- B. Section 01 33 00 Submittal Procedures: Requirements for submittals.
- C. Product Data: Submit data on pipe materials, pipe fittings, valves, and accessories.
- D. Shop Drawings: Indicate piping layout, including piping specialties.

# 1.4 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturer's name and pressure rating. Perform Work according to Cheyenne Board of Public Utilities standards.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver and store valves in shipping containers with manufacturer's labeling in place and inspect for damage.
- C. Block individual and stockpiled pipe lengths to prevent moving.
- D. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.

## **1.6 EXISTING CONDITIONS**

- A. Field Measurements:
  - 1. Verify field measurements prior to fabrication.
  - 2. Indicate field measurements on Shop Drawings.

## PART 2 PRODUCTS

- 2.1 High Density Polyethene Pipe:
  - A. Comply with AWWA C901/C906, ASTM D2239, ASTM D2737, ASTM D3035, PE 4710, ANSI/NSF-14.
- 2.2 Underground Pipe Markers
  - B. Manufacturers:
    - 1. Submit to Engineer.
  - C. Plastic Ribbon Tape:
    - 1. Brightly colored, continuously printed with applicable text.
    - 2. Minimum 6 inches wide by 4 mil thick.
    - 3. Manufactured for direct burial service.

## D.Trace Wire:

- 1. Electronic detection materials for nonconductive piping products.
- 2. Unshielded, 10 AWG, THWN-insulated copper wire.
- 3. Conductive tape.

## 2.3 MATERIALS

- A. Bedding and Cover:
  - 1. Bedding: Fill Type as specified in Section 31 05 13 Soils for Earthwork.
  - 2. Cover: Fill Type, as specified in Section 31 05 13 Soils for Earthwork.
  - 3. Soil Backfill from above pipe cover to Finish Grade:

- a. Soil Type, as specified in Section 31 0513 Soils for Earthwork.
- b. Subsoil with no rocks over 3 inches in diameter, frozen earth, or foreign matter.

# PART 3 EXECUTION

## A. EXAMINATION

- 1. Section 01 70 00 Execution and Closeout Requirements: Requirements for installation examination.
- 1. Verify that existing utility water main size, location, and invert are as indicated on Drawings.

## **B. PREPARATION**

- 1. Section 01 70 00 Execution and Closeout Requirements: Requirements for installation
- preparation.
- 2. Pipe Cutting:
  - a. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
  - b. Use only equipment specifically designed for pipe cutting; use of chisels or hand saws is not permitted.
- 3. Grind edges smooth with beveled end for push-on connections.
- 4. Remove scale and dirt on inside and outside before assembly.
- 5. Prepare pipe connections to equipment with flanges or unions.

# C. INSTALLATION

- 1. Excavation:
  - a. Excavate pipe trench as specified in Section 31 23 17 Trenching.
  - b. Hand trim excavation for accurate placement of pipe to elevations as indicated on Drawings.
- 2. Dewater excavations to maintain dry conditions and to preserve final grades at bottom of excavation.
- Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 8 inches compacted depth, and compact to 95 percent of maximum density.
- 4. Piping:
  - a. Install pipe according to AWWA C600.
  - b. Handle and assemble pipe according to manufacturer instructions and as indicated on Drawings.
  - c. Steel Rods, Bolt, Lugs, and Brackets: Coat buried steel with one coat of coal tar coating before backfilling.
  - d. Maintain 10 feet horizontal separation of water main from sewer main.
  - e. Install ductile-iron piping and fittings according to AWWA C600.
  - f. Weld pipe according to AWWA C206, and weld joints according to AWWA C205.
  - g. Flanged Joints: Not to be used in underground installations except within structures.
  - h. Route pipe in straight line; re-lay pipe that is out of alignment or grade.
  - i. High Points:

a)Install pipe with no high points.

- b)If unforeseen field conditions arise that necessitate high points, install air release valves as directed by Engineer.
- 5. Bearing:
  - a. Install pipe to have bearing along entire length of pipe.
  - b. Excavate bell holes to permit proper joint installation.
  - c. Do not lay pipe in wet or frozen trench.
- 6. Prevent foreign material from entering pipe during placement.
- 7. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- 8. Close pipe openings with watertight plugs during Work stoppages.
- 9. Install access fittings to permit disinfection of water system performed under Section 33 13 00
   Disinfecting of Water Utility Distribution.
- 10. Cover:
  - a. Establish elevations of buried piping with not less than 7 feet of cover (8 feet if water line is not looped).
  - b. Measure depth of cover from final surface grade to top of pipe barrel.
- 11. Pipe Markers:
  - a. Install plastic ribbon tape and trace wire continuous buried 36 inches below finish grade, above piping.
  - b. Coordinate with trench Work as specified in Section 31 23 23 Fill.
- 12. Polyethylene Encasement:
  - a. Encase piping in polyethylene where indicated on Drawings to prevent contact with surrounding backfill material.
  - b. Comply with AWWA C105.
  - c. Terminate encasement 3 to 6 inches above ground where pipe is exposed.
- 13. Thrust Restraints:
  - a. Provide valves, tees, bends, caps, and plugs with concrete thrust blocks.
  - b. Pour concrete thrust blocks against undisturbed earth.
  - c. Locate thrust blocks at each elbow or change of pipe direction to resist resultant force and to ensure that pipe and fitting joints will be accessible for repair.
  - d. Install tie rods, clamps, setscrew retainer glands, or restrained joints.
  - e. Protect metal-restrained joint components against corrosion by applying a bituminous coating or encasing metal area using concrete mortar.
  - f. Do not encase pipe and fitting joints to flanges.
  - g. Install thrust blocks, tie rods, and joint restraint at dead ends of water main.
- 14. Backfilling:
  - a. Backfill around sides and to top of pipe with cover fill in maximum lifts of 6 inches, tamp in place, and compact to 95 percent of maximum density.
  - b. Place and compact material immediately adjacent to pipes to avoid damage to pipe and prevent pipe misalignment.
  - c. Maintain optimum moisture content of bedding material to attain required compaction density.
- 15. Disinfection of Potable Water Piping System:
  - a. As specified in Section 33 13 00 Disinfecting of Water Utility Distribution.

## D. TOLERANCES

- 1. Section 01 40 00 Quality Requirements: Requirements for tolerances.
- 2. Install pipe to indicated elevation within tolerance of 5/8 inch.

# E. FIELD QUALITY CONTROL

- 1. Section 01 40 00 Quality Requirements: Requirements for inspecting and testing.
- 2. Pressure test system according to AWWA C600 and following:
- a. Test Pressure: Not less than 200 psig or 50 psi in excess of maximum static pressure, whichever is greater.
- b. Conduct hydrostatic test for at least two hours.
- c. Slowly fill section to be tested with water; expel air from piping at high points. Install corporation cocks at high points. Close air vents and corporation cocks after air is expelled. Raise pressure to specified test pressure.
- d. Observe joints, fittings, and valves under test. Remove and renew cracked pipes, joints, fittings, and valves showing visible leakage. Retest.
- e. Correct visible deficiencies and continue testing at same test pressure for additional two hours to determine leakage rate. Maintain pressure within plus or minus 5 psi of starting test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
- f. Compute maximum allowable leakage using following formula:
  - a)L = SD x sqrt(P)/C.
    - (1)L = testing allowance, gph.
    - (2)S = length of pipe tested, feet.
    - (3)D = nominal diameter of pipe, inches.
    - (4)P = average test pressure during hydrostatic test, psig.
    - (5)C = 148,000.
  - b)If pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.
  - 3. Leakage:
  - a)If test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections, and retest until leakage is within allowable limits.
  - b)Correct visible leaks regardless of quantity of leakage.
  - c)If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

# SECTION 33 13 00 - DISINFECTING OF WATER UTILITY DISTRIBUTION

# PART 1 GENERAL

# 1.1 SUMMARY

- A. Section includes disinfection of site potable water piping; and testing and reporting results.
- B. Related Sections:
  - 1. Section 33 11 16 Site Water Utility Distribution Piping Product and Execution requirements for installation, testing, of site domestic water distribution piping.

## 1.2 REFERENCES

- A. American Water Works Association:
  - 1. AWWA B300 Hypochlorites.
  - 2. AWWA B301 Liquid Chlorine.
  - 3. AWWA C651 Disinfecting Water Mains.

# 1.3 SUBMITTALS

- A. Disinfection Report:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of disinfectant injection start and time of completion.
  - 3. Test locations.
  - 4. Name of person collecting samples.
  - 5. Initial and 24 hour disinfectant residuals in treated water in ppm for each outlet tested.
  - 6. Date and time of flushing start and completion.
  - 7. Disinfectant residual after flushing in ppm for each outlet tested.
- B. Bacteriological Report:
  - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
  - 2. Time and date of water sample collection.
  - 3. Name of person collecting samples.
  - 4. Test locations.
  - 5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
  - 6. Coliform bacteria test results for each outlet tested.

# 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C651.
- B. Maintain one copy of each document on site.

# PART 2 PRODUCTS

# 2.1 DISINFECTION CHEMICALS

A. Chemicals: Sodium Hypochlorite - NaOCl.

## PART 3 EXECUTION

## 3.1 EXAMINATION

- A. Section 01 30 00 Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify piping system has been cleaned, inspected, and pressure tested.
- C. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

## 3.2 INSTALLATION

- A. Inject treatment disinfectant into piping system.
- B. Maintain disinfectant in system for 24 hours.
- C. Provide bacteriological sampling reports to Client for approval.
- D. Once approval is provided by Client, flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.
- E. Replace permanent system devices removed for disinfection.

## 3.3 FIELD QUALITY CONTROL

- A. Disinfection, Flushing, and Sampling:
  - 1. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is no higher than 1.0 ppm.
  - 2. Legally dispose of chlorinated water. When chlorinated discharge may cause damage to environment, apply neutralizing chemical to chlorinated water to neutralize chlorine residual remaining in water.

## SECTION 33 13 13 - WATER STORAGE TANK DISINFECTION

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Water tank disinfection.
  - 2. Bacteriological testing.
- B. Related Sections:
  - 1. Section 43 41 11 Bolted Steel Tanks.

## 1.2 REFERENCES

A. American Water Works Association:1. AWWA C652 - Disinfection of Water Storage Facilities.

## 1.3 SUBMITTALS

- A. Disinfection Procedure: Submit procedure description including type of disinfectant and calculations indicating quantities of disinfectants required to produce specified chlorine concentration in accordance with Section 3 and 4 of AWWA C652.
- B. Test Reports: Indicate results of bacteriological and residual chlorine laboratory test reports.

## 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C652.
- B. Perform Work in accordance with Colorado Department of Public Health and Environment.

# 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Store disinfectants in cool, dry place away from combustibles such as wood, rags, oils and grease.
- C. Handle disinfectants with caution; protect skin and eyes from contact; avoid breathing vapors; wear gloves, aprons, goggles, and vapor masks.

## 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Furnish personnel working inside tank during disinfection with equipment to comply with Federal and State regulations for work conducted in hazardous atmosphere.
- B. Neutralize disinfectant solution before disposal.
- C. Legally dispose of disinfection solution off Project site.

D. Repair damage caused by disinfectant solution and disinfection procedures.

# PART 2 PRODUCTS

- 2.1 DISINFECTANTS
  - A. Chlorine Forms: In accordance with AWWA C652, Section 3.

## PART 3 EXECUTION

## 3.1 EXAMINATION

- A. Section 01 30 00 Administrative Requirements: Verification of existing conditions before starting work.
- B. Conduct inspection of tank interior before beginning disinfection.
  - 1. Verify tank is clean and free of polluting materials.
  - 2. Verify tank pipe and vent connections are properly made and clear of obstructions.
  - 3. Verify paint is thoroughly cured in accordance with paint manufacturer's instructions.

## 3.2 PREPARATION

A. Protect aquatic life and vegetation from damage from disinfectant solution purged from tank.

#### 3.3 APPLICATION

- A. Use any one or a combination of the three methods for disinfecting tank specified in Section 4 of AWWA C652:
  - 1. Chlorination Method 1.
  - 2. Chlorination Method 2.
  - 3. Chlorination Method 3.

## 3.4 FIELD QUALITY CONTROL

- A. Collect samples of water from filled tank for bacteriological analysis in accordance with Section 4.4 of AWWA C652; take inlet and outlet water samples.
- B. Test water samples for residual chlorine and bacteriological contaminants.
- C. When water samples fail to meet State Health Standards for potable water perform the following corrective measures until water quality conforms to State Health Standards:
  - 1. Inlet and Outlet Water Sample Failure: Eliminate source of contamination in water supply, repeat disinfection, and retest water quality.
  - 2. Outlet Water Sample Failure: Repeat disinfection, and retest water quality.

## SECTION 40 05 23.15 - GATE VALVES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Resilient-seated gate valves.
- B. Related Requirements:
  - 1. Section 40 05 23 Common Work Results for Process Valves

## 1.2 REFERENCE STANDARDS

- A. American Society of Mechanical Engineers:
  - 1. ASME B16.1 Gray Iron Pipe Flanges and Flanged Fittings.
  - 2. ASME B16.5 Pipe Flanges and Flanged Fittings: NPS 1/2 through 24 Metric/Inch Standard.
  - 3. ASME B16.42 Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300.
  - 4. ASME B1.20.1 Pipe Threads, General Purpose (Inch).
- B. American Water Works Association:
  - 1. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service.

## 1.3 SUBMITTALS

- A. Product Data:
  - 1. Submit catalog information, indicating materials of construction and compliance with indicated standards.
- B. Operation and Maintenance Manual.

## 1.4 WARRANTY

A. Manufacturer's warranty.

## PART 2 PRODUCTS

# 2.1 RESILIENT-SEATED GATE VALVES

- A. Manufacturer List:
  - 1. Mueller A-2360
  - 2. Approved Equal.
- B. Description:
  - 1. AWWA C509-01.
  - 2. Minimum Working Pressure: 250 psig.
  - 3. End Connections: Mechanical joint.

- 4. Provide gear actuators conforming to AWWA C509 for manual valves.
- C. Operation:
  - 1. Rising stem.

# 2.2 SOURCE QUALITY CONTROL

- A. Testing: Test gate valves according to AWWA C509.
- B. Engineer shall be notified of test before it occurs.

# PART 3 EXECUTION

# 3.1 INSTALLATION

- A. Install according to manufacturer's instructions.
- B. Support valves in plastic piping to prevent undue stresses on piping.

## SECTION 43 41 11 - BOLTED STEEL TANKS

## GENERAL

#### 1.1 SUMMARY

- A. Section Includes: Factory-coated bolted steel tanks.
- B. Related Requirements:
  - 1. Project Geotechnical Report Available Project Information: Subsurface investigation report, bore hole locations, and findings of subsurface materials.

#### 1.2 DEFINITIONS

- A. Purchaser: Contractor, as used in AWWA D103.
- B. Tank Low Level: Level when emptied through specified discharge fittings unless otherwise indicated on Drawings.

#### 1.3 REFERENCE STANDARDS

- A. American Water Works Association:
  - 1. AWWA D103-09.
- B. NSF International:
  - 1. NSF 61 Drinking Water System Components Health Effects.
  - 2. NSF 372 Drinking Water System Components Lead Content.
- C. Occupational Safety and Health Administration:
  - 1. OSHA 29 CFR 1910 Occupational Safety and Health Standards.

## 1.4 COORDINATION

- A. Section 01 30 00 Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with location and placement of utilities, piping, and tank foundation.

## 1.5 PREINSTALLATION MEETINGS

- A. Section 01 30 00 Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

## 1.6 SCHEDULING

A. Schedule Work of this Section after Work for support pad and prior to connecting piping Work.

## 1.7 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

#### B. Product Data:

- 1. Submit data for expansion joint fittings and other pipe specialty fittings.
- 2. Submit data for ladder and ladder safety devices.
- 3. Submit information concerning materials of construction, fabrication, and coatings.

## C. Shop Drawings:

- 1. Indicate:
- a) Complete plan, elevation, and sectional Drawings showing critical dimensions.
- b) Structural plate and support member sizes and thickness.
- c) Weld types and sizes.
- d) Water supply and overflow piping details, including fittings, expansion joints, and pipe support methods.
- e) Ladder and ladder safety device details.
- f) Handrail details.
- g) Access hatch details.
- h) Foundation ring structural design.
- D. Manufacturer's Certificate:
  - 1. Certify that tanks and appurtenances meet or exceed specified requirements.
  - 2. Owner Installation Certificate: Obtain from equipment manufacturer's representative and submit, attesting that equipment has been properly installed and is ready for startup and testing.
- E. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations and assumptions for tank structural calculations.
- F. Test and Evaluation Reports:
  - 1. Submit mill test reports.
  - 2. Written Report Certifying Work: Prepare and submit as indicated in AWWA D103.
  - 3. Submit Installation Certificate from equipment manufacturer's representative as described in PART 3.
- G. Manufacturer Instructions: Submit detailed instructions on installation requirements, including tank component handling procedures, anchoring, and layout.
- H. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- I. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- J. Manufacturer Reports: Certify that tank has been installed according to manufacturer instructions.

#### 1.8 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual location and orientation of tank and appurtenances.

#### 1.9 QUALITY ASSURANCE

- A. Perform Work according to AWWA D103.
- B. Materials in Contact with Potable Water: Certified to NSF Standards 61 and 372.
- C. Perform Work according to Teller County standards.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

#### C. Storage:

- 1. Store materials in areas protected from weather and moisture and according to manufacturer instructions.
- 2. Do not store products directly on ground.
- D. Handling: Handle materials in a manner to prevent damage to interior or exterior surfaces.

#### E. Protection:

- 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
- 2. Provide additional protection according to manufacturer instructions.

## 1.11 EXISTING CONDITIONS

- A. Field Measurements:
  - 1. Verify field measurements prior to fabrication.
  - 2. Indicate field measurements on Shop Drawings.

#### 1.12 WARRANTY

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish five-year manufacturer's warranty for bolted steel tank.

# PRODUCTS

- 2.1 TANKS
  - A. Manufacturers:
    - 1. Tank Connection.
    - 2. Approved Equal.
  - B. Description:

1.

- 1. Design, fabricate, and erect 100,000 gallon ground-level, bolted steel potable water reservoir and accessories.
- C. Performance and Design Criteria:
  - Conform design to requirements listed in AWWA D103, unless supplemented or modified in this Section:
    - a. Bottom capacity level (BCL) and top capacity level (TCL) above top of foundation.
    - b. Roof and Bottom: As indicated on Drawings.
    - c. Location of Site: As indicated on Drawings.
    - d. Snow Loading:
      - 1) Comply with AWWA D103, Section 5.2.3.1 and Teller County Building Department Requirements.
    - e. Wind Loading:
      - 1) Comply with AWWA D103, Section 5.2.4 and Teller County Building Department Requirements.
    - f. Earthquake Loading:
      - 1) Comply with AWWA D103, Section 5.2.5 and Teller County Requirements.

# 2.2 TANK CONSTRUCTION

- A. Comply with requirements listed in AWWA D103, unless supplemented or modified below:
  - 1. Pipe and Fittings for Fluid Conductors: Modify to indicate only welded joints for conductors are acceptable.
  - 2. Roof Support: According to AWWA D103.
  - 3. Pipe and Pipe Connections:
    - a. Silt Stop: Provide removable stainless-steel silt stop and mechanical joint gland.
    - b. Provide other accessories as indicated on Drawings.
  - 4. Overflow:
    - a. As indicated on Drawings.
    - b. Provide welded joint steel overflow pipe as indicated on Drawings, suitably supported and extending to grade level.
    - c. Overflow Diameter: As indicated on Drawings.
    - d. Terminate overflow pipe at 2 feet above finished grade to provide air break.
    - e. Provide #24 aluminum or bronze mesh insect screen and screen holder over air break opening.
  - 5. Roof Ladder: As indicated on Drawings.
  - 6. Safety Devices:
    - a. Comply with OSHA standards.
    - Specification Sheet for Seismic Data: According to AWWA D103.

7.

# 2.3 INLET AND OUTLET PIPE

A. Description: ASTM A53 (A53M), Grade B, Schedule 40, steel pipe, welded joints.

# 2.4 OVERFLOW PIPE

A. Description: ASTM A53 (A53M), Grade B, Schedule 40, steel pipe, welded joints.

## 2.5 MATERIALS

A. Furnish materials complying with this Section, as indicated on Drawings, and according to AWWA D103.

## 2.6 FABRICATION

A. Materials, Design, and Fabrication: According to AWWA D103.

## 2.7 SOURCE QUALITY CONTROL

A. Provide shop inspection and testing of component parts.

## EXECUTION

# 3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for erection examination.

B. Verify layout and orientation of tank accessories and piping connections.

## 3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for erection preparation.

## B. Support Pad:

- 1. Thoroughly clean tank pad, removing loose concrete, dust, and other debris.
- 2. Place building paper on pad according to tank manufacturer's recommendations prior to placing tank.

# 3.3 INSTALLATION

A. According to AWWA D103, as indicated on Drawings, and according to manufacturer instructions.

B. Connect piping to tank.

C. To complete installation, install tank accessories not factory mounted.

Section 43 41 11- Bolted Steel Tanks

D. Touch-up Painting and Coating: According to manufacturer instructions.

# 3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for inspecting and testing.

- B. Inspection and Testing:
  - 1. Hydrostatic Testing:
    - a. Test completed and cleaned tank for liquid tightness by filling tank to its overflow elevation with water provided by Owner.
    - b. Correct leaks disclosed by this test.
    - c. Drain and legally dispose of test water.
- C. Equipment Acceptance:
  - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
  - 2. Make final adjustments to equipment under direction of manufacturer's representative.
- D. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.