



ADDENDUM NO. 1  
TO THE CONTRACT DOCUMENTS  
for the construction of

Date: July 10, 2017  
Project No.: 674010

**W.B. CASEY WATER RECLAMATION FACILITY POLISHING  
PLANT AND WAS THICKENING UPGRADES**

CLAYTON COUNTY WATER AUTHORITY  
CLAYTON COUNTY, GEORGIA

**To All Planholders and/or Prospective Bidders:**

The following changes, additions, and/or deletions are hereby made a part of the Contract Documents for the construction of the W.B. Casey Water Reclamation Facility Polishing Plant and WAS Thickening Upgrades dated May, 2017 as fully and completely as if the same were fully set forth therein:

**A. CLARIFICATION**

1. Question: Section 03 30 00 Part 3.11 G. 4. A. says that the water source for water tightness testing will be Plant Water (W3) and will be provided in accordance with Section 01 50 00. Section 01 50 00 Part 3.02 D. 1. does not identify whether the Owner will provide Plant Water (W3) at no charge to the Contractor when used for water tightness testing. Please clarify?

Response: W3 will be provided at no charge.

2. Question: Section 01 50 00 Part 3.02.D.1.d. says, "Water use in excess of 20 gpm must be approved and coordinated with Owner in advance." Will Plant Water for water tightness testing be available to the Contractor at flow rates greater than 20 gpm?

Response: Yes. But flow in excess of 20 gpm needs to be coordinated to ensure there are no conflicts with periodic maintenance (washdown, etc.) during which plant operators require higher W3 flows.

3. Question: Are there any seasonal restrictions associated with the work on the Flint River Outfall / Effluent Pipeline?

Response: There are no seasonal restrictions associated with Flint River Outfall. Refer to Drawings and Nationwide Permit 12 for guidelines on disturbing areas west of Roberts Road.

4. Question: Section 00 11 16 lists the starting time of the non-mandatory pre-bid conference as 3:00 p.m. on July 11th. Section 00 21 13 lists 2:00 p.m. Please clarify which time is correct?

Response: The pre-bid conference will be held at 3:00 p.m. on July 11th.

5. Question: What permits are required by the Contractor?

Response: Contractor will be responsible for the building permit and the NPDES permit for discharge of stormwater related to construction activities.

6. Question: What is the anticipated date of the Notice to Proceed?

Response: We anticipate the NTP to be on or around November 1st, 2017.

7. Question: For insurance purposes, what is the value of the existing DAF Odor Control System?

Response: Engineer's opinion of the replacement cost is \$200,000.

8. Question: Section 01 31 13 Part 1.06 G. 3. specifies the use of electric bypass pumps. Will the Owner pay for the electricity usage during bypass pumping?

Response: No.

9. Question: In the event of a power outage, do the electric bypass pumps require standby (backup) diesel pumps or a generator?

Response: Yes. Backup power will be required for the bypass pumping operation.

10. Question: Regarding the Gas Line Encroachment in Section 01 31 13 Part 1.08. A., can you provide the appropriate contact information for the gas companies?

Response: Kinder Morgan:

Deb Hefner (Sr. Right-of-Way Agent)  
569 Brookwood Village # 712-C  
Birmingham, Alabama 35209  
(205) 325-3812 (Office)  
Deborah\_Hefner@kindermorgan.com

John Gober (Damage Prevention)  
(770) 478-6405 Office  
(478) 972-8562 Cell  
John\_Gober@kindermorgan.com

Atlanta Gas Light (AGL)/ Southern Company:  
 Mary Jo Diana (Sr. Land Management Agent) Land Services  
 404.584.3839 Office  
 404.831.9437 Mobile  
[mdiana@southernco.com](mailto:mdiana@southernco.com)

Randy Davis (Right-of-Way Inspector)  
 Asset Protection Department  
 404.309.5397 Mobile  
[johdavis@southernco.com](mailto:johdavis@southernco.com)

11. Question: Is the 16" W1 line within the natural gas easement controlled by the CCWA or someone else?

Response: The 16" W1 in the natural gas easement is owned and maintained by CCWA.

**B. PART 1, PROCUREMENT REQUIREMENTS**

**1. Section 00 21 13, Instructions to Bidders**

Page 2, 1.04 Pre-Bid Conference, first sentence DELETE "... 2:00 p.m. and REPLACE with 3:00 p.m. ..."

**C. PART 3, SPECIFICATIONS**

**1. Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION**

Page 1, 1.01 SUBMITTALS, Paragraph A.3.c, DELETE "Progress Schedule: 2 legible copies." and REPLACE with "Progress Schedule: 4 legible copies."

Page 1, 1.01 SUBMITTALS, Paragraph A.3, ADD the following:

"e. List of critical work items for the next 30 days."

**2. Section 01 43 33, MANUFACTURERS FIELD SERVICE**

Page 4, 3.03 TRAINING; Paragraph E. ADD "Training is to be recorded by a professional videographer."

**3. Section 01 50 00, Temporary Facilities and Controls**

Page 7, 3.02.D.1.d, DELETE and REPLACE with: "Water use in excess of 20 gpm must be approved by and coordinated with Owner in advance to ensure there are no conflicts with periodic maintenance (washdown, etc.) during which plant operators require higher W3 flows."

4. **Section 31 63 16, AUGER CAST GROUT PILES**

DELETE in its entirety and REPLACE with the attached.

5. **Section 33 05 13, MANHOLES**

Page 9, Paragraph 3.05.E, DELETE and REPLACE with "Manholes shall be rated for HS25 loading."

6. **Section 33 13 00, DISINFECTION OF WATER UTILITY DISTRIBUTION FACILITIES**

DELETE in its entirety and REPLACE with the attached.

D. **DRAWINGS**

1. In Process Manhole Schedule. For Manhole MH-6, change size from "5' DIA" to 6' DIA"

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 in the Bid Form or by submitting the Addendum with the bid package. Bid Forms submitted without acknowledgment or without this Addendum will be considered in nonconformance.

CH2M HILL

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Project Manager

Appended hereto and part of Addendum No. 1:

Section 31 63 16, Auger Cast Grout Piles attached.

Section 33 13 00, Disinfection of Water Utility Distribution Facilities attached.

**END OF ADDENDUM**



**SECTION 31 63 16**  
**AUGER CAST GROUT PILES**

**PART 1      GENERAL**

**1.01      REFERENCES**

A.    The following is a list of standards which may be referenced in this section:

1.    American Concrete Institute (ACI): 315R Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.
2.    ASTM International (ASTM):
  - a.    A82, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - b.    A276, Standard Specification for Stainless Steel Bars and Shapes.
  - c.    A615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  - d.    C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - e.    C33, Standard Specification for Concrete Aggregates.
  - f.    C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - g.    C109, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or (50-mm) Cube Specimens).
  - h.    C150, Standard Specification for Portland Cement.
  - i.    C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
  - j.    C937, Standard Specification for Grout Fluidifier for Preplaced-Aggregate Concrete.
  - k.    C939, Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete.
  - l.    E329, Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

**1.02      DEFINITIONS**

- A.    Auger Refusal: Auger penetration rate of less than 1 foot per minute of drilling applicable for a power unit of suitable type and size when operating in accordance with manufacturer's specifications, wherein to continue drilling particular piling would be impractical.
- B.    Design Position: The location of the centroid of the pile at cutoff elevation (x, y, and z coordinates) as shown.

- C. Elevations: Referenced to NAVD 88.
- D. Obstruction: Sudden and significant decrease of auger penetration and deviation out of tolerance resultant of encountering a subsurface or physical condition.
- E. Production Piles: Piles incorporated into the Work, using a uniform selection of materials and workmanship, and which are determined acceptable by Engineer based on observation and pile test results.
- F. Pump Stroke: A full cycle of the grout pump piston.
- G. Test Pile: Pile installed with the same equipment, materials, and procedures as production piles; but subject to static load test, as specified herein. The test pile can be used as production pile, if approved by the Engineer and if the pile is not damaged and is not loaded to plunging failure as defined in Section 31 09 18, Static Pile Testing.

### 1.03 SUBMITTALS

#### A. Action Submittals:

- 1. Product data on portland cement, mineral admixture (if applicable), fluidifier (water reducing agent and retardant).
- 2. Drawing(s) showing production pile identification numbering. Make identification number a four digit number starting with 5301.
- 3. Shop and Erection Details and Reinforcement Requirements: ACI 315.
- 4. Show that augering, mixing, installation methods and procedures, and pumping and augering equipment comply with Contract Documents, and include details for:
  - a. Establishing Pile Location: Scaled pile placing plan with identifying numbers for piles, pile size, and location referenced to known point(s) defined by the Contract Documents.
  - b. Augering.
  - c. Grout injection.
  - d. Reinforcement placement.
  - e. Pile cutoff.

#### B. Informational Submittals:

- 1. Installer qualifications.
- 2. Manufacturer's Certification of Compliance: Commercial products.
- 3. Certified Test Results: Grout mix, including certification of minimum 28-day compressive strength.
- 4. Mill Certificates: Steel reinforcement.



5. Certification of Calibration:
  - a. Pressure Meter Gauges: Monitor pressure during grout injection.
  - b. Grout Pump: Indicate volume per stroke.
6. Method to layout and maintain pile locations.
7. Methods and materials for transporting and placing specified grout during extreme hot and cold weather conditions.
8. Manufacturer's Data/Specifications/Maintenance Instructions:
  - a. Pile Drilling System: Crane and leads, power unit, auger rotary head and hydraulic pack, auger flights, sizes, dimensions, depth measurement system, tolerance measurement, and auxiliary equipment.
  - b. Grout Pumping System: Pump, type, and model number, volume measurement type and calibration, pressure gauge type and calibration, and location.
9. Reinforcement Placement System: Method to set and maintain proper cage alignment.
10. Batch Plant System: System type, transportation method, cycle time, and measurement.
11. Daily Log and Record: At end of each working day, submit two copies of each record for every auger-cast pile installed that day.
12. Record Drawings: Scaled pile plan with identifying numbers for piles, pile size, and location referenced to known point(s) defined by the Contract Documents.

#### 1.04 QUALIFICATIONS

- A. Shop Drawings: Prepared, stamped, and signed by an engineer registered in the State of Georgia.
- B. Piling Installer and on-site Supervisor: Minimum of 5 years of past successful experience on at least 10 projects of auger cast grout pile installation of similar scope and magnitude.

#### 1.05 SEQUENCING AND SCHEDULING

- A. Complete earthwork in vicinity of pile to top elevation of augered pile prior to commencing drilling.
- B. Begin production piling after successful completion of testing as specified in Section 31 09 18, Static Pile Testing.

### **PART 2 PRODUCTS**

#### 2.01 CEMENT

- A. ASTM C150, Type II.

2.02 MINERAL ADMIXTURE

- A. ASTM C618.

2.03 FLUIDIFIER

- A. Water Reducing Agent and Retardant: ASTM C937.

2.04 WATER

- A. Potable, fresh, clean and free of sewage, oil, acid, alkali, salts, or organic matter.

2.05 AGGREGATE

- A. Fine Aggregate: As specified in ASTM C33.
- B. In accordance with Section 03 30 00, Cast-in-Place Concrete.

2.06 STEEL REINFORCEMENT

- A. As specified in Section 03 21 00, Steel Reinforcement:
  - 1. Deformed Bars: ASTM A615, Grade 60.
  - 2. Spiral Steel Reinforcement: ASTM A82.
  - 3. Rebar Spacers: Plastic.
  - 4. Centralizers: Plastic.

- B. End Cap: Plastic.

2.07 GROUT MIX

- A. Proportion by weight to produce a grout capable of being satisfactorily pumped and of penetrating and filling all voids.
- B. Minimum Compressive Strength:
  - 1. 4,000 psi at 28 days.
  - 2. 3,000 psi at 7 days.
- C. Minimum Flow Cone Rate: 10 seconds to 25 seconds with modified 3/4-inch opening flow cone.
- D. Grout Mix: Contractor's certified and successfully tested grout design approved by Engineer for incorporation into piles.

## 2.08 FABRICATION

- A. Reinforcement Cage: Fabricate to maintain straightness and rigidity during picking and installation process.
  - 1. Top and bottom fillet weld lap splices.
  - 2. Tack weld spiral steel connections.
  - 3. Minimum of two picking points for cages longer than 10 feet.

## PART 3 EXECUTION

### 3.01 PILE RIG

- A. Auger Leads:
  - 1. Capable of supporting auger rotary head, auger flight, and pump hoses without deviation from vertical or specified batter during pile augering and grout injection, on the Site ground surface.
  - 2. Prevent rotation during pile construction by a stabilizing arm or by firmly placing the bottom of the leads into the ground or by other acceptable means.
  - 3. Mark clearly at 1-foot and 5-foot intervals to allow measurement of auger penetration and removal.
- B. Auger Hoisting Equipment: Capable of withdrawal and rotation of the auger during grout injection at a smooth and constant rate.

### 3.02 AUGERING EQUIPMENT

- A. Auger Flighting:
  - 1. Continuous from auger head to top of the auger without gaps or other breaks.
  - 2. Minimum inside diameter of hollow shaft, 1-1/4 inches.
  - 3. Capable of augering a minimum 16-inch diameter hole.
  - 4. Uniform in diameter throughout its length, tolerance of no more than 3 percent of specified diameter.
  - 5. Over 40 Feet in Length: Support and contain in rig leads by appropriately sized intermediate guides.
  - 6. Exit Hole for Grout Injection: Locate at bottom of the auger.
- B. Auger Rotary Head and Power Unit: Suitable type and size to produce completed pile.

3.03 GROUT MIXING EQUIPMENT

- A. Use during preparation and handling such as to produce a homogeneous specified grout mix.

3.04 GROUT PUMPING EQUIPMENT

- A. Pump:
  - 1. Positive displacement type, capable of developing displacement pressures at the pump not less than 400 psi.
  - 2. Calibrate pump discharge capacity in strokes per cubic foot. Attach digital or mechanical stroke counters or other acceptable methods to pump to determine volume by number of pump strokes.
  - 3. Equip with a screen with clear openings of 0.125-inch maximum size at pump inlet to remove oversized particles and accessible for inspection and cleaning.
- B. Pressure Gauges:
  - 1. Locate at Grout Pump: Mount in clear view of operator.
  - 2. Locate on grout delivery pipe at or close to the auger rotary head with a clearly observable readout.

3.05 REINFORCEMENT INSERTION EQUIPMENT

- A. Capable of installing specified reinforcement type to required depth without damage or disturbance to augered hole, in-place grout, or steel reinforcement.

3.06 AUTOMATED MONITORING EQUIPMENT (AME)

- A. AME shall be PIR-A manufactured by Pile Dynamics, Inc., or equal.
- B. The AME shall have the following components:
  - 1. Display Unit: To display numerically and/or graphically the collected information from various sensors, and transfer results to onsite printer for permanent record. This unit shall be mounted in the cab to provide immediate feedback to the crane operator, particularly during the critical grouting phase to verify minimum grout volume per depth increment. The results shall be stored in electronic format on retrievable memory card for possible further evaluation.

2. Depth Sensor (Rotary Encoder on Self-Retracting Cable Spool Attached to Drill Top or Gear Box): To monitor auger tip depth at all times during installation. A real time clock shall be included so that the installation drilling rate (foot per minute) is displayed during drilling. The depth sensor shall record pile depth (referenced to ground elevation) to confirm pile length.
3. Magnetic Flow Meter (MFM) (or Other Flow Measuring Device): To be installed in the grout line near the crane to measure grout volume pumped within accuracy of plus or minus 2 percent.
4. Grout Pressure Sensor: To monitor maximum and minimum grout pressure in the grout line.
5. Field Printer: To record a hard copy of results for each pile. One copy of printed results shall be provided to the Engineer immediately following completion of each pile.
6. Torque Pressure Sensor: To monitor the hydraulic pressure provided to the gearbox. This pressure can then be approximately converted to torque on some equipment.
7. Angle Analyzer: To determine angle of installation of the pile.

### 3.07 INSTALLATION

- A. Provide Engineer 14 days' notice prior to pile installation and perform only in presence of the Engineer.
- B. Sequence pile installation adjacent to recently installed piles to avoid disturbance, such as a drop in existing pile grout surface.
  1. Load of Drilling Equipment: Far enough away from pile being drilled to avoid compressing or shearing of soil.
  2. Place no piles within 8 feet of adjacent piles until grout in adjacent piles has set for one 24-hour period.
- C. Perform continuous operation during installation process.
- D. Remove equipment failing to perform and replace with acceptable equipment.

### 3.08 DRILLING

- A. Drill to auger refusal or to the specified maximum pile length for each facility, whichever is encountered first. If apparent refusal is reached several feet above the anticipated rock or refusal of adjacent completed piles, continuous augering for five or more minutes may be required by the Engineer in an attempt to penetrate possible obstructions such as boulders or rock lenses. Check verticality or batter of leads at start and maintain throughout drilling.
- B. Place suitable plug or disposable plug material in outlet hole at the bottom of the auger to keep hole closed throughout drilling.

- C. Auger Advancement: Continuous rate that prevents removal of excess soil.
- D. Auger Diameter: Verify daily and report to Engineer.
- E. Defective Piles: Will be rejected. Install new pile or piles at location(s) designated by the Engineer. Cut off rejected piles below grade and abandon.

### 3.09 REINFORCEMENT STEEL

- A. Install in center of pile with minimum 3-inch clear cover and as specified in Section 03 21 00, Steel Reinforcement.
- B. Install steel reinforcement cages after grout injection has been completed.
- C. End Cap: Install end cap at with each single bar reinforcement.

### 3.10 GROUT INJECTION

- A. At the start of grout pumping, raise auger from 6 inches to 12 inches for the pile toe depth, and after the grout pressure has built up sufficiently to blow out the bottom plug and create a head of grout above the discharge point, redrill auger to original toe elevation.
- B. Maintain a positive slow rotation of the auger during grout injection and auger withdrawal, do not permit counterclockwise rotation.
- C. If (i) auger jumps upward during withdrawal, (ii) grouting process is interrupted, or (iii) there is decreased grouting pressure, then reinsert auger to original toe elevation and decrease rate of withdrawal to prevent further jumping.
- D. Maintain a minimum grout (pressure) head of at least 10 feet of grout on the auger flighting above the injection point during auger raising. Coordinate rate of auger withdrawal to maintain 10 feet minimum grout head.
- E. Total volume of grout pumped: At least 115 percent of the theoretical volume for each foot of pile installation. If the volume is less than 115 percent in any 1-foot interval, stop pumping and advance auger by redrilling 10 feet or to bottom of pile (whichever is less) and reinstall pile from that point.
- F. After grout reaches the ground surface from auger flighting, rate of grout injection and auger withdrawal shall maintain a constant flow of grout at surface. If pumping of grout is interrupted, advance the auger by redrilling at least 5 feet below auger toe and resume pumping from that point.
- G. Age of grout at time of discharge into auger shall not exceed 90 minutes.

- H. Prior to reinforcement installation, promptly clear away spoil that has accumulated from grout injection and screen from grout inclusions of spoil in the top of pile.
- I. Spoil that has accumulated from the grout injection shall be disposed of properly with no environmental impact to the disposal area.
- J. Completely install and protect piles at end of each day's operations. Do not leave partially completed piles overnight.
- K. Tolerances:
  - 1. Install piles with a variation of not more than 2 percent from vertical or 4 percent from batter shown.
  - 2. Pile centroid at cut off elevation shall not vary from design position shown by more than 1 inch after installation.
- L. Defective Piles: Correct piles drilled in excess of specified tolerances by reaming to a larger diameter or by redrilling in correct locations, as determined by Engineer. Fill abandoned piles with concrete.

### 3.11 PILE CUTOFF

- A. Obtain final pile cutoff elevations after successful completion of installation.
- B. Either remove fresh grout from pile head or by cut off hardened grout after initial set has occurred.

### 3.12 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. Owner-Furnished Quality Assurance, in accordance with IBC Chapter 17 requirements, is provided in the Statement of Special Inspections Plan on Drawings. Contractor responsibilities and related information are included in Section 01 45 33, Special Inspection, Observation, and Testing.
- B. Contractor-Furnished Quality Control: Inspection and testing as required in Section 01 45 16.13, Contractor Quality Control.
- C. Grout Sampling and Testing:
  - 1. As specified in Section ASTM C939, CRD 611-94, and ASTM C109, including:
    - a. Flow cone test requirements. Flow cone test frequency, one test for every 50 cubic yards of grout.
    - b. Temperature requirements.
    - c. Age of grout requirements.

- d. Sampling for representative test cubes required for compressive strength tests during pile injection and cured as specified in ASTM C109.
- e. Sampling frequency, obtain at least one set of samples for every 50 cubic yards of grout.

D. Daily Log and Record: Document for each pile showing as a minimum:

- 1. Identification mark, shaft diameter, date drilled, location, equipment used.
- 2. Installation time data, including start and completion of drilling, grout injection, steel reinforcement placement, capping, inspection, test samples with identification numbers.
- 3. Ground elevation at start of drilling, depth drilled, top and bottom elevation of each pile.
- 4. Top and bottom elevation of steel reinforcement within the pile.
- 5. Concrete pump calibration (volume/stroke).
- 6. Grout Injection Data: Batch quantity, field test samples for flowable consistency, test cubes, water added, and temperature.
- 7. Continuous quantity of grout placed per 3-foot depth (interval).
- 8. Theoretical and actual volume of grout placed.
- 9. Nature and location of obstructions encountered, water conditions during drilling and grout placement, Site activities near freshly completed piles, and as Engineer may otherwise reasonably request).
- 10. Completed Pile Installation Data Record form for each pile installed (form provided by Engineer).
- 11. Data collected from AME for each pile.

E. Static Pile Testing: Plan, coordinate, and accomplish static pile load testing as specified in Section 31 09 18, Static Pile Testing.

**END OF SECTION**



**SECTION 33 13 00**  
**DISINFECTION OF WATER UTILITY DISTRIBUTION FACILITIES**

**PART 1      GENERAL**

**1.01      REFERENCES**

A.    The following is a list of standards which may be referenced in this section:

1.    American Water Works Association (AWWA):
  - a.    B300, Hypochlorites.
  - b.    B301, Liquid Chlorine.
  - c.    B302, Ammonium Sulfate.
  - d.    B303, Sodium Chlorite.
  - e.    C651, Disinfecting Water Mains.
  - f.    C652, Disinfection of Water Storage Facilities.
  - g.    C653, Disinfection of Water Treatment Plants.
2.    NSF International (NSF):
  - a.    NSF/ANSI 61, Drinking Water System Components - Health Effects.
  - b.    NSF/ANSI 372, Drinking Water System Components - Lead Content.
3.    Standard Methods for the Examination of Water and Wastewater, as published by American Public Health Association, American Water Works Association, and the Water Environment Federation.

**1.02      SUBMITTALS**

A.    Informational Submittals:

1.    Plan describing and illustrating conformance to appropriate AWWA standards and this Specification.
2.    Procedure and plan for cleaning system.
3.    Procedures and plans for disinfection and testing.
4.    Proposed locations within system where Samples will be taken.
5.    Type of disinfecting solution and method of preparation.
6.    Certification that employees working with concentrated chlorine solutions have received appropriate safety training.
7.    Method of disposal for highly chlorinated disinfecting water.

## **PART 2 PRODUCTS**

### **2.01 GENERAL**

- A. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
  - 1. Use or reuse of components and materials without a traceable certification is prohibited.

### **2.02 WATER FOR DISINFECTION AND TESTING**

- A. Clean, uncontaminated, and potable.
- B. Owner will supply potable quality water. Contractor shall convey in disinfected pipelines or containers.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Conform to AWWA C651 for pipes and pipelines and C653 for water treatment plants and filters, except as modified in these Specifications.
- B. Contractor's Equipment:
  - 1. Furnish chemicals and equipment, such as pumps and hoses, to accomplish disinfection.
  - 2. Water used to fill pipeline may be supplied using a temporary connection to existing distribution system. Provide protection against cross-connections as required by AWWA C651.
- C. Disinfect the following items installed or modified under this Project, intended to hold, transport, or otherwise contact potable water:
  - 1. Filters.
  - 2. Piping: Disinfect new potable water pipes that connect to existing pipelines up to point of connection.

3. Disinfect surfaces of materials that will contact finished water, both during and following construction, using one of the methods described in AWWA C652 and AWWA C653. Disinfect prior to contact with finished water. Take care to avoid recontamination following disinfection.
- D. Prior to application of disinfectants, clean pipelines of loose and suspended material.
- E. Allow freshwater and disinfectant solution to flow into pipe or vessel at a measured rate so chlorine-water solution is at specified strength. Do not place concentrated liquid commercial disinfectant in pipeline or other facilities to be disinfected before it is filled with water.

### 3.02 PIPING

- A. Cleaning:
  1. Before disinfecting, clean foreign matter from pipe in accordance with AWWA C651.
  2. If continuous feed method or slug method of disinfection, as described in AWWA C651, are used flush pipelines with potable water until clear of suspended solids and color. Provide hoses, temporary pipes, ditches, and other conduits as needed to dispose of flushing water without damage to adjacent properties.
  3. Flush service connections and hydrants. Flush distribution lines prior to flushing hydrants and service connections. Operate valves during flushing process at least twice during each flush.
- B. Disinfecting Procedure: In accordance with AWWA C651, unless herein modified.

### 3.03 DISPOSAL OF CHLORINATED WATER

- A. Do not allow flow into a waterway without neutralizing disinfectant residual.
- B. See appendix of AWWA C653 for acceptable neutralization methods.

### 3.04 TESTING

- A. Collection of Samples:
  1. Coordinate activities to allow Samples to be taken in accordance with this Specification.
  2. Provide valves at sampling points.
  3. Provide access to sampling points.

B. Test Equipment:

1. Clean containers and equipment used in sampling and make sure they are free of contamination.
2. Obtain sampling bottles with instructions for handling from Owner's laboratory.

C. Chlorine Concentration Sampling and Analysis:

1. Collect and analyze Samples in accordance with AWWA C651, AWWA C652, and AWWA C653.
2. Analyze Samples for coliform concentrations in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.
3. Sampling points shall be representative and accepted by Engineer.

D. If minimum Samples required above are bacterially positive, disinfecting procedures and bacteriological testing shall be repeated until bacterial limits are met.

**END OF SECTION**