

## SECTION 1448

### SODIUM HYPOCHLORITE ADDITION FACILITIES

#### 1448.0100 GENERAL

#### 1448.0101 Description of Work.

##### (A) Scope.

(1) Contractor shall provide all labor, materials, and incidentals as shown, specified, and required to fabricate and install sodium hypochlorite addition facilities at potable water or reclaimed water production or booster/reservoir facilities. The work includes, but is not limited to, the following: (SD 1620)

- (a) Sodium hypochlorite metering pumps with de-gassing heads. Pulsafeeder Series "E" only.
- (b) High Density Cross-linked polyethylene storage tanks.
- (c) Precast reinforced concrete containment vault.
- (d) Fiberglass reinforced plastic shelters.
- (e) Safety shower and eyewash stations.
- (f) Piping, valves, and appurtenances.
- (g) Concrete containment vault structure coating system.

##### (B) Related Sections.

- (1) Site Work
- (2) Concrete and Reinforcing Steel
- (3) Piping, Valves and Appurtenances

#### 1448.0102 Quality Assurance

##### (A) Manufacturers' Qualifications.

- (1) Manufacturer of tanks and metering pumps shall have a minimum of five years of experience in the production of substantially similar equipment and shall show evidence of satisfactory service in at least five installations.
- (2) Each type of equipment provided shall be the product of one manufacturer.

##### (B) Source Quality Control.

- (1) The manufacturer of fiberglass reinforced plastic shelters and cross-linked polyethylene tanks shall maintain a continuous quality control program, and upon request, shall furnish certified test results of material physical properties to the Engineer. Material properties shall meet or exceed those specified herein.
- (2) Cross-linked polyethylene tanks shall be inspected for defects in accordance with the requirements of ASTM D2563.

## SECTION 1448

(C) **Reference Standards.** Comply with the applicable provisions and recommendations of the following:

- (1) American Society of Testing and Materials (ASTM).
- (2) American National Standards Institute (ANSI).
- (3) National Electrical Manufacturers Association (NEMA).
- (4) National Electric Code (NEC).
- (5) Standards of American Water Works Associations (AWWA).
- (6) Institute of Electrical and Electronic Engineers (IEEE).

### 1448.0103 Submittals.

(A) **Shop Drawings.** Submit for approval the following:

- (1) Evidence of minimum qualifications specified in paragraph 1.2.A.
- (2) Manufacturers' literature, illustrations, specifications, detailed drawings, data, and descriptive literature on all equipment.
- (3) Deviations from Plans and Specifications.
- (4) Engineering data including dimensions, materials, size, and weight.
- (5) Fabrication, assembly, installation, and wiring diagrams.

(B) **Operation and Maintenance Data.** Submit complete manuals including:

- (1) Copies of all Shop Drawings, maintenance data and schedules, description of operation, and spare parts information.

### 1448.0104 Product Delivery, Storage and Handling.

(A) Deliver materials to the site to insure uninterrupted progress of the work.

(B) Store materials to permit easy access for inspection and identifications.

(C) Store all mechanical equipment in covered storage off of the ground, and prevent condensation.

### 1448.0200 PRODUCTS

#### 1448.0201 Details of Construction.

(A) **Metering Pumps.** Pulsafeeder Series "E" only:

- (1) Metering pumps shall be of the electronic solenoid-driven flat diaphragm type.
- (2) Service Conditions:
  - (a) Service: Sodium hypochlorite solution with 10-15% available chlorine.
  - (b) Ambient temperature: 25°F to 125°F.
  - (c) Maximum liquid flow rate: As noted on Plans.
  - (d) Maximum back pressure: As noted on Plans.

## SECTION 1448

- (3) Construction:
    - (a) Diaphragm: Teflon-faced, metal-reinforced.
    - (b) Other wetted parts: PVC.
    - (c) Piston drive type: Thermally-protected solenoid with automatic reset, 110-volt electrical service, when required.
  - (4) Pumps shall be provided with the following:
    - (a) Gravity-seating ball valves.
    - (b) De-gassing head.
    - (c) Manual stroke length adjustment from 0-100%.
    - (d) Manual stroke rate adjustment from 10-100%.
    - (e) When shown on Drawings, also provide 4-20 mADC external pacing and stop inputs, Series "E" plus.
  - (5) Product and Manufacturer: Provide PULSAtron Series E or Series E Plus metering pump manufactured by Pulsafeeder of Punta Gorda, Florida, as shown on plans. Substitutions will not be considered.
- (B) High-Density, Linear, Polyethylene (HDLPE), NSF Approved, Sodium Hypochlorite Storage Tank.**
- (1) Design Conditions:
    - (a) Ambient Temperature: 25°F to 125°F.
    - (b) Service: Sodium hypochlorite solution 10-15% available chlorine (specific gravity = 1.2).
    - (c) Pressure: Atmospheric.
    - (d) External loads: None.
    - (e) Tank configuration: Flat bottom, closed top, vertical, cylindrical, with 8-inch diameter threaded lid.
    - (f) Working Volume: As noted on Plans.
  - (2) Materials of Construction:
    - (a) The tanks shall be manufactured of high-density, linear, rotationally-molded seamless polyethylene.
    - (b) The tank shall have weatherability equal to CL200 resin with 0.5% UV stabilizer.
    - (c) Resin used in tank manufacture shall be HDLPE. The rotationally molded material shall meet or exceed the following properties:

## SECTION 1448

<u>Parameter</u>	<u>ASTM Standard</u>	<u>Value</u>
Density (Resin)	D1505	0.940-0.945 g/cc
Tensile Strength (Yield)	D638	2700-3400 PSI
Elongation @ Break	D638	350-460%
ESCR (100% IGEPAL)	D1693	400-1000 hours
ESCR (10% IGEPAL)	D1693	200-500 hours
Vicat Softening Temperature	D1525	235°F
Flexural Modulus	D790	9700-103,000 PSI
Gold Impact (-40°F) 1/4" sample	D1998	100 Ft. – Lbs.

(d) Tank color shall be natural.

(3) Manufacturers:

- (a) Snyder Industries, Inc., Lincoln, Nebraska
- (b) Rotronics Manufacturing, Inc., Gardena, California
- (c) Nalgene Industrial Products, Rochester, New York
- (d) Or approved equal.

### (C) Fiberglass Reinforced Plastic Shelters.

(1) Fiberglass reinforced plastic (FRP) shelters shall be constructed of molded fiberglass, factory-assembled to make a bonded unit with no external seam or joint covers.

(2) Construction:

- (a) Walls and roof: Single layer fiberglass laminated skin.
- (b) Dimensions: As shown on Plans.
- (c) Door: Gasketed 40-inch wide by 80-inch high by 1 3/4-inch thick fiberglass/foam insulation sandwich construction door with key-lockable doorknob.
- (d) Louvers: Two 12-inch by 12-inch aluminum louvers.
- (e) Design wind load: 85 mph.

(3) Materials of Construction:

- (a) Fiberglass laminate:
  - (1) Minimum structural wall thickness: 1/8-inch
  - (2) Polyester resin reinforced with a minimum of 25% by weight "E" glass veil.

(4) Manufacturers: Provide equipment manufactured by one of the following;

- (a) Associated Fiberglass Engineers, Fort Worth, Texas
- (b) Warminster Fiberglass, Southampton, Pennsylvania
- (c) Or approved equal.

## SECTION 1448

### (D) Emergency Shower and Eyewash Stations.

#### (1) Materials:

- (a) Shower: Stainless steel shower head with 1 1/4-inch instant action stay-open chrome-plated brass ball valve and stainless steel 24-inch rigid pull rod.
- (b) Eye/Face Wash: Stainless steel bowl with twin stainless steel heads mounted on chrome-plated brass supply with chrome-plated brass ball valve, instant-action, stay-open type. Valve shall include sufficient hand actuation lever for operation.
- (c) Pipe: Insulated 1 1/4-inch schedule 40 galvanized steel pipe (all galvanized piping, below grade shall be wrapped).

#### (2) Product and Manufacturer:

- (a) Model W9327 with WP828SS shower head and WP1000SS eyewash heads as manufactured by Western Emergency Equipment, Emeryville, California.
- (b) Model 8300.8127 as manufactured by Haws Drinking Faucet Company, Berkeley, California.
- (c) Model G1902-HFC-SSH as manufactured by Guardian Equipment Company, Chicago, Illinois.
- (d) Or approved equal.

### (E) Polyvinyl Chloride Pipe.

- (1) PVC pipe shall be Type 1, Schedule 80, conforming to ATM D 1785.
- (2) PVC pipe fittings shall be solvent welded socket type below ground and threaded above ground, conforming to ASTM D 2467, unless otherwise shown.
- (3) Manufactures: Spears Manufacturing Company, Sylmar, California.

### (F) PVC Ball Valves.

- (1) Ball valves on PVC piping shall be manufactured of polyvinyl chloride (PVC) material with Teflon seats and Viton seals.
- (2) PVC shall be Type 1, Grade 1 in accordance with ASTM D 1784, and shall be dark gray in color.
- (3) Valve shall be threaded and rated for 150 psi service.
- (4) Manufacturer: Provide PVC Ball Valves of one of the following:
  - (a) Spears Manufacturing Company, Sylmar, California
  - (b) Or approved equal.

### (G) Concrete Containment Vault Structure Coating System.

## SECTION 1448

- (1) Chemical Concentration: Sodium Hypochlorite – 10 to 15% available chlorine.
- (2) Type of Coating: High-solids epoxy cross-linked with an amine curing agent.
- (3) Physical Properties:
  - (a) Temperature resistance: 125°F at specified chemical concentration.
  - (b) Percents solids by volume: 82% +/- 2% (mixed).
  - (c) Volatile organic compounds: 1.31 pounds per gallon (unthinned); 1.84 pounds per gallon (thinned 10%).
- (4) Application Thickness:
  - (a) Primer: not required (self-priming).
  - (b) Finish coat: Two coats at 8 to 12 mils per coat.
- (5) Product and Manufacturer:
  - (a) Series 61 Tneme-liner by Tnemec.
  - (b) Or approved equal.