SECTION 463313 - SODIUM HYPOCHLORITE GENERATING EQUIPMENT

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The designer shall make all technical edits specific to the project for this section.

This Section includes self-contained sodium hypochlorite generators for water and wastewater disinfection systems.

Check state and local requirements regarding design, installation, and permitting of chlorination systems. Add specific state and local requirements as they apply to this Section.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Sodium hypochlorite generating equipment.
          2. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 400523 - Stainless Steel Process Pipe and Tubing: Pipe and tubing for process systems.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. National Electrical Manufacturers Association:

NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

* + - * 1. American Public Health Association, American Water Works Association, Water Environment Federation:

Standard Methods for the Examination of Water and Wastewater.

* + - 1. COORDINATION
         1. Coordinate Work of this Section with [**plant operations**] [**Director’s Representative**] <**\_\_\_\_\_\_\_\_**>.
      2. PREINSTALLATION MEETINGS
         1. Convene minimum [**one**] <**\_\_\_\_\_\_\_\_**> [**week**] [**weeks**] prior to commencing Work of this Section.
      3. SCHEDULING
         1. Schedule Work of this Section after concrete work for support pad and prior to connecting piping.
      4. SEQUENCING
         1. Sequence Work to prevent interference with [**plant operations**] [**Director’s Representative's operation**] <**\_\_\_\_\_\_\_\_**>.
      5. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
        2. Manufacturer’s installation instructions shall be provided along with product data.
        3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
        4. Product Data:

Submit complete information concerning materials of construction, fabrication, and protective coatings.

* + - * 1. Shop Drawings:

Indicate materials and equipment, including wiring and control diagrams, performance charts and curves, installation and anchoring requirements, fasteners, and other details.

Submit schematic diagram of each system, including tag marks for each item of equipment cross-referenced to hypochlorite generation system equipment list.

* + - * 1. Manufacturer's Certificate: Certify that [**products**] <**\_\_\_\_\_\_\_\_**> meet or exceed [**specified requirements**] <**\_\_\_\_\_\_\_\_**>.

Include separate Paragraphs for additional certifications.

* + - * 1. Test and Evaluation Reports: Submit certified factory test results.
        2. Manufacturer's Instructions:

Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.

Submit installation, selection, and hookup configuration, with pipe and accessory elevations.

Submit hanging and support requirements and recommendations.

* + - * 1. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
        2. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        3. Manufacturer Reports: Indicate that equipment has been installed according to manufacturer's instructions.
        4. Qualifications Statements:

Coordinate following Subparagraphs with the requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer and installer.

Submit manufacturer's approval of installer.

* + - 1. CLOSEOUT SUBMITTALS
         1. Project Record Documents: Record actual locations and final orientation of equipment and accessories.
         2. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.
      2. MAINTENANCE MATERIAL SUBMITTALS
         1. Spare Parts:

Furnish [**one set**] [**two sets**] of manufacturer's recommended spare parts.

* + - * 1. Tools: Furnish special [**wrenches**] <**\_\_\_\_\_\_\_\_**> and other devices required for Director’s Representative to maintain and calibrate hypochlorite generation system.
      1. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Perform Work according to <**\_\_\_\_\_\_\_\_**> standards.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting the Work of this Section on-Site.
      1. QUALIFICATIONS

Coordinate following Paragraphs with the requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
        2. Installer: Company specializing in performing Work of this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience [**and approved by manufacturer**].
      1. DELIVERY, STORAGE, AND HANDLING
         1. Deliver materials in manufacturer's packaging including installation instructions.
         2. Inspection: Accept equipment on-Site in manufacturer's original packaging. Inspect for damage.
         3. Store products [**according to manufacturer's instructions**] [**and**] [**in areas protected from weather, moisture, or possible damage**].
         4. Protect systems from entry of foreign materials by using temporary covers and by isolating parts of completed system.
      2. WARRANTY

This Article extends warranty period beyond one year. Extended warranties may increase construction costs and Director’s Representative enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for <**\_\_\_\_\_\_\_\_**>.

1. PRODUCTS
   * + 1. SODIUM HYPOCHLORITE GENERATING EQUIPMENT
          1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=10998&mf=04&src=wd):

Designer to provide two manufacturers and approved equivalent for all listed products.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Subparagraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

High-efficiency electrolytic cells.

Regenerative water softener.

Control panel and power supply.

Brine metering pump.

Skid-mounted configuration.

Hydrogen-removal system.

Salt-dissolution tank.

Hypochlorite storage tank.

Hypochlorite metering pump.

* + - * 1. Performance and Design Criteria:

Rate of sodium hypochlorite production will vary with feed water temperature and chemistry. Coordinate with manufacturer.

Hypochlorite Production: <**\_\_\_\_\_\_\_\_**> gal./day at 0.6 to 0.8 percent concentration.

Brine Solution: <**\_\_\_\_\_\_\_\_**> lb./gal. salt.

Raw Material Consumption per 2.2 lb. Available Chlorine:

Salt: [**13**] <**\_\_\_\_\_\_\_\_**> lb

Potable Water: [**53**] <**\_\_\_\_\_\_\_\_**> gal

Electric Power: [**5.5**] <**\_\_\_\_\_\_\_\_**> kWh.

* + - * 1. Cells:

Electrode Type: [**Internal bipolar**] [**Flat plate bipolar**] [**Tubular bipolar**] <**\_\_\_\_\_\_\_\_**>.

Arrangement: [**Vertical**] [**Horizontal**].

Baffles: [**None**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Operation:

[**<\_\_\_\_\_\_\_\_> rated load amperes].**

Voltage: <**\_\_\_\_\_\_\_\_**> V, [**single**] [**three**] phase, 60 Hz.

Maximum [**Fuse Size**] [**Circuit Breaker Size**] [**Overcurrent Protection**]: <**\_\_\_\_\_\_\_\_**> A.

Minimum Circuit Ampacity: <**\_\_\_\_\_\_\_\_**>.

Controls:

Programmable logic controller controlled.

Displays and monitors the system trends, history, configuration, maintenance, and alarms.

Disconnect Switch: Factory-mounted disconnect switch [**in control panel**] [**on equipment**].

Operation Sequences: <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Materials:

Sodium Hypochlorite Tank: [**Fiberglass**] [**PE**].

Cell Housing: PVC, fiberglass, or acrylic.

Electrode: Plated titanium.

Electrical Enclosures: NEMA [**4X**] [**7**] <**\_\_\_\_\_\_\_\_**>; [**fiberglass**] [**sheet steel**] <**\_\_\_\_\_\_\_\_**>.

Hydrogen Vent Pipe:

Stainless-steel tubing, Schedule [**10S**] [**80S**] <**\_\_\_\_\_\_\_\_**>.

Outside Diameter: [**1**] <**\_\_\_\_\_\_\_\_**> inch

End Style: [**Plain**] [**Threaded, Schedule 80S**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Accessories:

Sodium hypochlorite solution metering pump.

Ultrasonic level control for storage tank(s).

Blower for active hydrogen venting.

Water and salt mixer.

Acid-wash cell-cleaning system.

* + - 1. SOURCE QUALITY CONTROL
         1. Performance Testing:

Free Chlorine:

Diethyl-p-phenylenediamine procedure, using a spectrophotometer (color wheel method not acceptable).

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Amperometric titration method, according to Standard Methods for the Examination of Water and Wastewater.

Include one or both of the following Paragraphs to require Director’s Representative's inspection or witnessing of test at factory.

* + - * 1. Director’s Inspection: Make completed sodium hypochlorite generating equipment available for inspection at manufacturer's factory prior to packaging for shipment. Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.
        2. Director’s Witnessing: Allow witnessing of factory inspections and test at manufacturer's test facility. Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspections and tests are scheduled.

Include following Paragraph when reliance on fabricator's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

Specified shop tests are not required for Work performed by approved fabricator.

1. EXECUTION
   * + 1. EXAMINATION
          1. Verify layout and orientation of equipment, accessories, and piping connections.
       2. INSTALLATION
          1. Install equipment and accessories as recommended by manufacturer and as indicated on [**Shop Drawings**] [**Drawings**].
          2. Install hydrogen vent to location outside of building wall as indicated on Drawings.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Installation Standards: Install Work according to <**\_\_\_\_\_\_\_\_**> standards.
      1. FIELD QUALITY CONTROL
         1. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> days on-Site for installation, inspection, field testing, and instructing Director’s Representative in maintenance of equipment.
         2. Equipment Acceptance:

Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.

Make final adjustments to equipment under direction of manufacturer's representative.

* + - * 1. Furnish Installation Certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.
      1. DEMONSTRATION
         1. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Director’s Representative.

END OF SECTION 463313