SECTION 463636 - GRAVIMETRIC FEED 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 equipment for feeding dry chemicals by gravity that will be used in water and wastewater treatment processes.

A gravimetric dry chemical feeder may be considered over a volumetric feeder if a precise rate of material distribution is required.

A weigh belt feeder may be used to provide a desired feed rate downstream based on volume for every rotation of the head pulley. Or, for greater accuracy, belt scales can be used to continuously monitor and control the feed rate.

A loss-in-weight feeder doses supplied material at a predetermined feed rate, typically through a screw (auger or helix), twin screw, or vibratory hopper. Dosage is regulated by amount of load that is lost as material is discharged, through feedback from a weighing sensor.

Dry chemical storage silos are specified in Section 463613, volumetric feed equipment in Section 463633, and dry chemical weighing equipment in Section 463623.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Weigh belt type gravimetric feeders.

Loss-in-weight type gravimetric feeders.

* + - * 1. 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 055000 - Metal Fabrications: Fasteners, brackets, and other miscellaneous metal fabrications as required by this Section.

Section 460553 - Identification for Water and Wastewater Equipment: Nameplates, labeling, and identification methods for process piping, valves, and accessories.

* + - 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. NSF International:

NSF 61 - Drinking Water System Components - Health Effects.

NSF 372 - Drinking Water System Components - Lead Content.

* + - 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. 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 manufacturer information for system materials and component equipment, including electrical characteristics and connection requirements.
        5. Shop Drawings:

Indicate size and configuration of assembly, mountings, weights, and accessory connections.

Indicate system materials, component equipment, wiring diagrams, and schematics.

* + - * 1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate Paragraphs for additional certifications.

* + - * 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. Qualifications Statements:

Coordinate following Subparagraphs with 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 of gravimetric feed equipment.
         2. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.
      2. QUALITY ASSURANCE

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

* + - * 1. Materials in Contact with Potable Water: Certified to NSF Standards 61 and 372.

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.
      1. QUALIFICATIONS

Coordinate following Paragraphs with 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. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
         2. Store materials according to manufacturer instructions.
         3. Protection:

Protect openings with temporary caps to prevent entry of foreign material.

Provide additional protection according to manufacturer instructions.

* + - 1. WARRANTY

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

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for gravimetric feed equipment and accessories.

1. PRODUCTS
   * + 1. GRAVIMETRIC FEEDERS - WEIGH BELT TYPE
          1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12286&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:

Enclosure: [**Carbon**] [**stainless**] steel.

Internal Components: [**Stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Belt: Reinforced [**neoprene**] [**polyurethane**].

Pulleys:

Material: [**Aluminum**] [**Stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Self-tracking and self-cleaning.

Gear Reducer Ratio: [**100:1**] [**200:1**] <**\_\_\_\_:\_\_\_\_**>.

* + - * 1. Weight Sensor:

Type: Single strain gauge load cell.

Material: Stainless steel.

Overload Protection: [**150**] <**\_\_\_\_\_\_\_\_**> percent.

Linearity: [**0.3**] <**\_\_\_\_\_\_\_\_**> percent of full scale.

Temperature and pressure compensated.

* + - * 1. Performance and Design Criteria:

Feed Rate: [**30**] [**75**] [**150**] <**\_\_\_\_\_\_\_\_**> cu. ft./hr

Accuracy:

Set Rate: Plus or minus 1.0 percent.

Totalized Weight: Plus or minus 0.5 percent.

* + - * 1. Operation:

Electrical Characteristics:

As specified in Section [**262923 - Variable-Frequency Motor Controllers**].

[**<\_\_\_\_\_\_\_\_> hp**] [**<\_\_\_\_\_\_\_\_> RLA**].

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

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

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

Minimum Power Factor: <**\_\_\_\_\_\_\_\_**> percent at rated load.

Motors:

[**Constant**] [**Variable**] speed.

Control Panel:

Factory mounted.

NEMA 250 Type [**1**] [**4**] <**\_\_\_\_\_\_\_\_**>.

Single-point power connection and grounding lug.

Controls: Belt tracking limit switches.

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

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

* + - * 1. Accessories:

[**Bolted**] [**Removable**] hopper cover.

Belt scrapers.

Adjustable belt take-ups.

Dust collector connection port.

Sampling valve.

* + - 1. GRAVIMETRIC FEEDERS - LOSS-IN-WEIGHT TYPE
         1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12287&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:

Materials:

Contact: [**Carbon steel**] [**Type 304 stainless steel**] [**Type 316 stainless steel**] [**PTFE**] [**Polyurethane**] <**\_\_\_\_\_\_\_\_**>.

Internal: [**Carbon steel**] [**Type 304 stainless steel**] [**Type 316 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Discharge Device:

[**Single**] [**Double**] auger.

Configuration: [**Helix**] <**\_\_\_\_\_\_\_\_**>.

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

Discharge Device:

Vibratory.

Configuration: [**Flat**] [**Tray**] [**Tube**] <**\_\_\_\_\_\_\_\_**>.

Drive Mechanism:

[**Polyurethane**] <**\_\_\_\_\_\_\_\_**> belt with removable guard.

Tensioner: Elastomer.

Hopper Capacity: [**0.75**] [**1.0**] [**1.5**] <**\_\_\_\_\_\_\_\_**> cu. ft

Cover Connections: [**Infeed**] [**, vent**] [**, and**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Weight Sensor:

Type: Single strain gauge load cell.

Material: Stainless steel.

Bridge: [**350**] <**\_\_\_\_\_\_\_\_**> ohms.

Signal: [**2**] [**or**] [**3**] mV/V.

Maximum Excitation: 15 V.

Temperature and pressure compensated.

* + - * 1. Performance and Design Criteria:

Minimum Feed Rate: <**\_\_\_\_\_\_\_\_**> lb./hr

Accuracy: Plus or minus [**0.25**] <**\_\_\_\_\_\_\_\_**> percent of set rate.

* + - * 1. Operation:

Electrical Characteristics:

[**<\_\_\_\_\_\_\_\_> hp**] [**<\_\_\_\_\_\_\_\_> RLA].**

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

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

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

Minimum Power Factor: <**\_\_\_\_\_\_\_\_**> percent at rated load.

Motors:

[**Constant**] [**Variable**] speed.

Control Panel:

Factory mounted.

NEMA 250 Type [**1**] [**4**] <**\_\_\_\_\_\_\_\_**>.

Single-point power connection and grounding lug.

Controls: Microprocessor.

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

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

* + - * 1. Accessories:

Vibration isolation pads.

Hopper Agitator: Separate drive.

[**Bolted**] [**Removable**] hopper cover.

* + - 1. SOURCE QUALITY CONTROL
         1. Provide shop inspection and testing of completed assembly.

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

* + - * 1. Director’s Inspection:

Make completed feeders available for inspection at manufacturer's factory prior to packaging for shipment.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.

* + - * 1. 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 if reliance on fabricator's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

If 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 that facility, piping, and electrical Work are ready to receive gravimetric feed equipment.
       2. INSTALLATION
          1. Install equipment and accessories as recommended by manufacturer and as indicated on [**Shop Drawings**] [**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. After installation, inspect and test for proper operation.
         2. Equipment Acceptance: Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
      2. DEMONSTRATION
         1. Demonstrate equipment routine maintenance and emergency repair procedures to Director’s Representative.

END OF SECTION 463636