SECTION 400571.16 - FLAP GATES

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 specifies flexible and heavy-duty flap gates for use in wastewater treatment plants.

Flap gates open automatically based on the differential pressure on the back of the gate. The gate then closes automatically as water on the face side of the gate rises above the water level on the back side.

When selecting gate materials, consult with gate manufacturer and select materials based on specific application.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Rubber and heavy-duty flap gates.
          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 400557 - Actuators for Process Valves and Gates: Manual, pneumatic, and electric motor actuators.

* + - 1. DEFINITIONS

Limit list of definitions to terms unique to this Section and not provided elsewhere.

* + - * 1. Seating Head: The distance from centerline of gate to maximum water level of channel.
      1. REFERENCE STANDARDS

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

* + - * 1. ASTM International:

ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

ASTM A536 - Standard Specification for Ductile Iron Castings.

ASTM B98 - Standard Specification for Copper-Silicon Alloy Rod, Bar and Shapes.

ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.

ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

* + - 1. PREINSTALLATION MEETINGS
         1. Convene minimum [**one week**] [**<\_\_\_\_\_\_\_\_> weeks**] prior to commencing Work of this Section.
      2. 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.

* + - * 1. Manufacturer’s installation instructions shall be provided along with product data.
        2. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
        3. Product Data: Submit manufacturer's product information for system materials and component equipment.
        4. Shop Drawings:

Indicate system materials and component equipment.

Indicate installation and anchoring requirements, fasteners, and other details.

Indicate gate identification number, location, service, type, size, design pressure, operator details, stem details, and loads.

* + - * 1. Manufacturer's Certificate:

Certify that products meet or exceed specified requirements.

Certify that installation is completed according to manufacturer instructions.

Include separate Paragraphs for additional certifications.

Include following Paragraph when Contractor is responsible for designing products or assemblies. List affected products when Section specifies more than one product.

* + - * 1. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations and assumptions for [**seating**] [**and**] [**unseating**] [**pressure**] [**pressures**].
        2. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
        3. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
        4. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        5. Qualifications Statements:

Coordinate following Subparagraphs with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer, installer, and licensed professional.

Submit manufacturer's approval of installer.

* + - 1. CLOSEOUT SUBMITTALS
         1. Project Record Documents: Record actual locations of installed flap gates and components.
      2. 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 Work of this Section on Site.
      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**].
        3. Licensed Professional: [**Professional engineer**] <**\_\_\_\_\_\_\_\_**> experienced in design of specified Work and licensed [**at Project location**] [**in State of <\_\_\_\_\_\_\_\_>**].
      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 materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. EXISTING CONDITIONS
         1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

* + - 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 flap gates.

1. PRODUCTS
   * + 1. FLEXIBLE FLAP GATES

Flap gates are typically used to regulate discharge through levees, sewer lines, or drainage conduits.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12729&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.

Configuration: [**Square**] [**Rectangular**].

Seating Head: <**\_\_\_\_\_\_\_\_**> feet

Opening Size: [**<\_\_\_\_\_\_\_\_> by <\_\_\_\_\_\_\_\_> inches]** [**As indicated on Drawings**].

* + - * 1. Frame:

Material: [**Type 304 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Components: Rear attaching flange, mounting holes, and two lifting lugs.

* + - * 1. Flap:

Configuration:

One piece, with no seams.

Furnish lifting lug at lower end.

Material: [**Neoprene**] <**\_\_\_\_\_\_\_\_**>.

Reinforcing Angles and Hardware: [**Type 304 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Mounting: Secured to hinge end of frame with clamping bars and bolts.

Hinge:

Type: Flexible.

Integral with flexible flap.

* + - * 1. Seals:

Material: Rubber.

Type: Hollow section or lip.

Adjustable in horizontal plane.

* + - 1. HEAVY-DUTY FLAP GATES

Flap gates are typically used to control discharge through levees, sewer lines, or drainage conduits.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12730&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:

Configuration: [**Circular**] [**Square**] [**Rectangular**].

Seating Head: <**\_\_\_\_\_\_\_\_**> feet.

Opening Diameter: [**<\_\_\_\_\_\_\_\_> inches**] [**As indicated on Drawings**].

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

Opening Size: [**<\_\_\_\_\_\_\_\_> by <\_\_\_\_\_\_\_\_> inches]** [**As indicated on Drawings**].

Pivot Radius: [**<\_\_\_\_\_\_\_\_> inches**] [**As indicated on Drawings**].

* + - * 1. Seat:

Configuration:

Flat back.

One piece.

Pivot Lug Bosses: Drilled and tapped to accept mounting studs.

Cover:

Configuration: One piece.

Furnish lifting eye for manual operation.

Material: [**Cast iron, ASTM A126, Class B**] [**Ductile iron, ASTM A536**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Seating Faces:

Configuration: Fit into matching dovetail slots on seat and cover.

Material: [**Silicon bronze, ASTM B98**] <**\_\_\_\_\_\_\_\_**>.

Consider specifying rubber seating for flap gates subject to slamming caused by pump discharge.

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

* + - * 1. Flexible Seating:

Material: [**Neoprene, ASTM D2000**] <**\_\_\_\_\_\_\_\_**>.

Impacted into dovetail slots and held in position without use of screws or other fasteners.

* + - * 1. Pivot Lugs:

Configuration:

One piece.

Double bossed.

Adjustable in horizontal plane.

Mounting: Two corrosion-resistant studs.

Material: [**Ductile iron, ASTM A536**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Links:

Configuration:

One piece.

Heavy duty.

Material: [**Ductile iron, ASTM A536**] <**\_\_\_\_\_\_\_\_**>.

Bushings:

Location: At each pivot point.

Material: [**Bronze, ASTM B584**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Fasteners: [**Stainless steel, ASTM F593**] <**\_\_\_\_\_\_\_\_**>.

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

* + - * 1. Finishes: As recommended by manufacturer.
      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 flap gates 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 manufacturer's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.

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

1. EXECUTION
   * + 1. EXAMINATION
          1. Verify that items provided by other Sections of Work are ready to receive Work of this Section.
       2. INSTALLATION
          1. According to manufacturer instructions and as indicated on Drawings.
          2. Flap Gates Attached to Concrete: Mount using anchor bolts and grout in place.

\*\*\*\*\*\* [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. Inspection:

Verify alignment of gate and components.

Verify that gate operates smoothly and does not bind.

* + - * 1. Testing:

Leakage: Not exceeding 0.1 gpm/ft. of seating perimeter under 20 feet of seating head and not exceeding 0.21 gpm/ft. under 20 feet of unseating head.

* + - * 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's personnel 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 that equipment has been properly installed and is ready for startup and testing.
      1. ADJUSTING
         1. Adjust flap gates to provide smooth operation.
      2. DEMONSTRATION
         1. Demonstrate equipment operation, routine maintenance, and emergency repair procedures to Director’s Representative's personnel.
      3. ATTACHMENTS

When relying on separate schedules, tables, illustrations, or forms to specify product requirements, include list of each attachment. Include identical list of attachments in Project Manual table of contents.

Insert attachments following END OF SECTION. Consider following example when developing Project schedule.

* + - * 1. Flap Gate Schedule:

FG-1:

Description: Basin Influent, Gate No. 1.

Type: Rubber flap.

Opening Size: <**\_\_\_\_\_\_\_\_**> by <**\_\_\_\_\_\_\_\_**> inches

Head:

Seating: <**\_\_\_\_\_\_\_\_**> feet

Unseating: <**\_\_\_\_\_\_\_\_**> feet

FG-2:

Description: Basin Influent, Gate No. 2.

Type: Rubber flap.

Opening Size: <**\_\_\_\_\_\_\_\_**> by <**\_\_\_\_\_\_\_\_**> inches

Head:

Seating: <**\_\_\_\_\_\_\_\_**> feet

Unseating: <**\_\_\_\_\_\_\_\_**> feet

END OF SECTION 400571.16