

# SECTION 15160 - ORIFICE PLATES

## City of San Diego, CWP Guidelines

### PART 1 -- GENERAL

#### 1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing orifice plate meters.

#### 1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

- 1. Section 15150 Meters, General

#### 1.3 SHOP DRAWINGS AND SAMPLES

- A. In addition to the requirements of Section 15150, the following shall be submitted in compliance with Section 01300:

- 1. Calculations prepared by manufacturer of orifice plates.

### PART 2 -- PRODUCTS

#### 2.1 GENERAL

- A. **Basic Design:** Orifice meter design and fabrication shall include an orifice plate, placed between 300-lb steel flanges. The flanges shall include 1/2-inch pressure taps and stainless steel tubing connected to flow indicator or transmitter. Where aeration systems are indicated, metered air temperature shall be 180 degrees F.

- B. **Schedule:** Orifice plate meters shall comply with the following:

<u>I.D.No.</u>	<u>Service</u>	<u>Pipe Size (In.)</u>	<u>Max. Flow ([ ])</u>	<u>Differential Pressure ([ ])</u>	<u>Line Pressure (psi)</u>
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

#### 2.2 BASIC MATERIALS

- A. **Orifice Plate:** Paddle type concentric orifice plates shall conform to outline dimensions of ISA-RP 3.2. On the upstream face of the handle, permanently mark bore diameter, flange size, flange rating and the word "upstream." On the downstream face of the handle, permanently mark the item number and plate material. Locate these markings on the outer portion of the handle for easy identification. Unless otherwise indicated, orifice plates shall be made of annealed Type 316 stainless steel, designed for orifice plates, and with thickness

as recommended by the manufacture, 1/8-inch minimum. The surface finish shall be 15-20 micro-inches roughness and the concentricity of the orifice shall not exceed 3 percent of the inside diameter of the meter tube. Bore tolerances shall comply with applicable standards of the American Society of Mechanical Engineers. Seals shall be Teflon with stainless steel retainer rings.

- B. **Instrumentation:** Orifice plate systems shall include a flow indicator and transmitter conforming to the requirements of Section 13300. Flow indicators shall have corrosion-resistant metal housings and shall be calibrated in gallons per minute or cubic feet per minute from zero to 150 percent of the maximum indicated. Flow indicators and transmitters shall be mounted on wall brackets or floor-mounted pipe supports within sight of the orifice plate but not more than 5 feet away. Sensing tubes shall include isolating valves. Orifice plate metering systems shall be accurate to plus or minus 2 percent.
- C. **Orifice Flanges:** Unless otherwise indicated, orifice flanges shall be ANSI 300 lb, forged steel per ASTM A105, raised-faced per ANSI B16.5, weld neck type, with 1/2-inch NPT tapped holes. Bore tolerances shall be per the latest recommendations of the American Gas Association. Two 1/6-inch gaskets shall be furnished with the orifice flanges to mount the orifice plate. Stud bolts shall be alloy steel per ASTM A193 and hexagonal nuts shall be carbon steel, C-1038 or A307. Jackscrew, centering pins, and knockout dowel pins shall also be furnished. Gaskets shall be compressed sheets of Aramid fiber base with nitrite binder and non-adhesive coating.

## 2.3 MANUFACTURERS

- A. Meters shall be manufactured by one of the following (or equal):

Daniel Industries, Inc.  
ITT-Barton  
Pennwalt Corporation (Wallace & Tiernan)

## PART 3 -- EXECUTION

### 3.1 INSTALLATION

- A. Orifice plate meters shall be installed in accordance with the manufacturer's installation instructions and Section 15150.

\*\* END OF SECTION \*\*