

## SECTION 15157 - VENTURI METERS

### City of San Diego, CWP Guidelines

#### PART 1 -- GENERAL

##### 1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing Venturi 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. Certified laboratory data showing flow vs. pressure drop.
- 2. Certified laboratory data showing flow coefficients ( $C_d$ ) are within 0.75 percent of standard.

#### PART 2 -- PRODUCTS

##### 2.1 GENERAL

- A. **Basic Design:** Meters shall be designed to indicate flow change as a Herschel Standard Venturi tube without use of devices which employ entire or partial pilot effects, or which amplify differential, or which introduce noise. The tube coefficient shall be constant for all pipe Reynolds numbers over a 10:1 range. Maximum headloss at maximum flow shall not exceed 10 percent of pressure drop. Minimum discharge coefficient shall be 0.97. The accuracy shall be plus or minus 1 percent of actual rate of flow corresponding to the differential produced over the ranges indicated. The total overall error of each flow measurement loop including flow tube, transmitting, receiving, and totalizing equipment shall not exceed 2 percent of actual rates of flow between the indicated flow ranges.
- B. **Compatibility:** Similar flow metering equipment shall be obtained from a single manufacturer.
- C. **Characteristics of Flow Tubes:** Meter shall be of the pressure differential-producing type utilizing static pressures sensed at the inlet and at the throat, without the use of devices which amplify differential through change in flow at the cross-sections where inlet and throat static pressure is sensed.
- D. **Tube Design:** The inlet section with high pressure tap shall be a cylindrical section of the same diameter as the pipe. The throat section with low pressure tap shall be cylindrical for

a minimum length of 1/2 of the throat diameter. The metering element shall be free of debris-collecting cavities or annular chambers and shall have single pressure connections at the inlet and at the throat.

**E. Schedule:** Venturi meters shall comply with the following:

<u>I.D. No.</u>	<u>Service</u>	<u>Size (In.)</u>	<u>Flow Range ([ ])</u>	<u>Differential ([ ])</u>	<u>Ends or Insert</u>	<u>Tube Material</u>
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

## 2.2 BASIC MATERIALS

- A. **Meter Body:** The venturi body shall be of cast iron complying with ASTM A 126, Grade B, with bronze throat complying with ASTM B 61, or of carbon steel with stainless steel trim. Internal ferrous surfaces shall be coated with epoxy complying with Section 09800. Except as otherwise indicated, the tubes shall have plain ends for butt-welding, grooved ends for mechanical type couplings, or flanged ends complying with ANSI/AWWA C110/A21.10, or AWWA C207.
- B. **Plastic-Inserts:** Where indicated, meters shall be of the short-pattern Venturi tube plastic-insert type, with pressure connections and instrumentation. Flow tubes shall have glass fiber polyester plastic outlet, inlet cone, and holding flange.
- C. **Instrumentation:** Flow transmitters shall comply with Section 13300. The flow transmitter shall be installed below the hydraulic flow line and shall be mounted on a floor stand or a wall bracket. The transmitter shall be connected to the flow tube by Type "K" copper tubes, with valves and vent connections as recommended by the manufacturer.

## 2.3 MANUFACTURERS

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

Badger Meter Mfg. Co.  
BIF (A Unit of General Signal)  
Fischer and Porter

## PART 3 -- EXECUTION

### 3.1 INSTALLATION

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

\*\* END OF SECTION \*\*