SECTION 15164 - ULTRASONIC FLOW METERS (FIELD-MOUNTED)

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing field-mounted ultrasonic flow meters with acoustic sensors, local flow indicators, electronic transmitters, mounting hardware, cables, junction boxes, and accessories.

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

PART 2 -- PRODUCTS

2.1 GENERAL

A. **Basic Design:** Field-mounted ultrasonic flow meters shall measure flow bi-directionally and shall consist of transducers mounted in bosses welded directly to metal pipes or transducers mounted to gasketed saddles strapped to concrete or plastic pipe. The meters shall be designed to measure flow by ultrasonic measurement of velocity and shall be suitable for measuring [raw sewage] [treated sewage effluent] [RAS/WAS] [raw water] [drinking water] with an accuracy of plus or minus 2 percent at velocities greater than one foot per second, from 10 to 100 percent of capacity.

B. **Schedule:** Ultrasonic flow meters shall comply with the following:

I.D. No.	Service	Pipe Size (In.)	Flow Range ([ ])	Line Pressure ([ ])	Pipe Material
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

2.2 BASIC MATERIALS

A. **Metering Elements:** Two sensors shall be welded to a straight pipe or secured by Type 316 stainless steel straps on opposite sides of the pipe, installed to ensure that acoustic pulses are transmitted diagonally upstream and downstream across the centerline of the pipe. Probes shall be wetted and removable under pressure and flow conditions. Meter shall be designed to operate on 110/220-volt ac supply with a power consumption of not more than 30 watts for indoor mounting and 250 watts for outdoor mounting with heater. The probes shall be fabricated of non-corrosive material and shall be equipped with an armored triaxial

cable. The equipment manufacturer shall recommend and select the signal and frequency to be utilized for the measurement to ensure proper ultrasonic transmission.

B. **Instrumentation:** The electronic unit recommended by the manufacturer to measure the flow of water in the pipe shall be housed in a NEMA 4X housing designed for wall-mounting. The electronic unit shall utilize the output of the velocity sensing probes to measure fluid velocity in each pipe and shall be factory wired, solid state. The electronic unit shall include an integral totalizer display and a data logger memory. An attached programming unit shall include a signal strength indication display for use during calibration of the meter unit. The transmitter unit shall produce a 4 to 20 mA-dc signal, and a scaled pulse output signal (where totalization is indicated) proportional to the flow rate. A local flow indicator, scaled in the indicated flow range, shall be installed in an accessible location to allow reading. Instrumentation shall comply with Section 13300.

2.3 MANUFACTURERS

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

Badger Meter, Inc.
Milltronics
Sparling Instrument Co., Inc.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. **General:** Sensors shall be located in accordance with the manufacturer's specifications using mounting templates provided by the manufacturer. Sensors shall be installed with a minimum of 10 pipe diameters of unobstructed straight upstream approach, and a minimum of 3 pipe diameters of unobstructed straight downstream pipe.

B. Sensors shall be installed in accordance with the manufacturer's installation instructions and Section 15150.

** END OF SECTION **