BEXAR METROPOLITAN WATER DISTRICT
MATERIALS SPECIFICATIONS

Section 042
Battery Operated Insertion Turbine Flow Meter

042.1 System Description

A Hot Tap Insertion Turbine Flow Meter shall consist of a turbine rotor assembly with sensor, A Hot Tap Insertion adapter, and integrally mounted electronics enclosure. The Flow Meter shall be capable of being installed in any pipe size from 2" through 48" without removing pressure from the pipe, using a standard, commercially available pipe-tapping tool. The Flow Meter shall be of the axial turbine type, and shall operate for 3 to 5 years on an internal battery power supply. Each Turbine Insertion Meter will have a meter serial number imprinted on the top upper housing of the meter.

042.2 System Description

1. **Turbine Rotor Assembly**

The turbine rotor shall be of the axial type. The turbine rotor shall be at least 1.5" in diameter. The rotor shall be suspended by means of an axle turning in jeweled bearings. The rotor and bearings shall be enclosed in a protective housing mounted on the end of the insertion shaft.

2. **Sensor Assembly**

The Flow Meter sensor shall be a non-drag sensor capable of operating on power from a single, C-size lithium battery for 3 to 5 years. The sensor shall be completely protected from the flow stream and shall be easily removable for repair and replacement by qualified personnel.

3. **Hot Tap Insertion Assembly**

The Flow Meter shall be supplied complete with adapter assembly to enable insertion under pressure through a 2" full port ball valve or corporation stop into any 2" FNPT opening in the pipe. The insertion shaft shall be heavy duty, at least ¾" in diameter, and shall be secured at the correct insertion depth by means of a compression-type fitting. The Flow Meter shall be capable of being inserted into the pipe and positioned correctly in the flow stream with no external devices whatsoever, up to a backpressure of 90 psig. The Flow Meter shall be capable of being mounted in any orientation. Profiling or traversing the pipe shall not be required. The tapping saddle or threaded coupling or weldolet, and the tapping machine shall be commercially available and shall be supplied by others.

4. **Electronics**

The Flow Meter shall be supplied with an integrally mounted electronics enclosure, with battery-operated flow computer. The enclosure shall be gasketed and rated NEMA 4X for environmental protection. The microcomputer shall be programmed by means of a touch pad and shall display on a two-line liquid crystal flow rate in GPM and totalize flow in cubic feet. The microcomputer shall have a non-resettable totalizer and a k-factor lockout to

protect from tampering. The sole power source for the microcomputer shall be an internal lithium battery, which shall be replaceable in the field without interruption of water service. The microcomputer shall be programmable easily by a qualified technician.

042.3 System Description

The Flow Meter shall be able to measure from 0.2 to 30 feet-per-second velocity in any size pipe from 2" to 48". The pipe shall be full of potable clean water, under pressure, with fully developed flow, and free from voids and entrained bubbles. The Flow Meter's accuracy shall be:

1% of Full Scale flow from 0.2 to 0.4 feet per second velocity
2% of indicated flow rate from 0.4 to 1.0 feet per second
1-1/2% of indicated flow rate from 1.0 to 20 feet per second
1% of Full Scale Flow from 20.0 to 30.0 feet per second

042.4 Warranty

The entire Flow Meter shall carry a two-year manufacturer's limited warranty.

END OF SECTION