

Section 02529.1

**GROUNDWATER WELL FLOW METERS**  
(For New Wells in the GRP)

PART 1 GENERAL

1.01 SUMMARY

This Section is intended to provide Well Owners who are constructing new wells under the Authority's Groundwater Reduction Program (GRP) the requirements for groundwater well flow meters that will be compatible with the Authority's Advanced Metering Infrastructure (AMI) system, as required by the Authority's Rate Order.

1.02 MEASUREMENT AND PAYMENT

- A. Well Owners are responsible for procuring, installing, operating, maintaining, and calibrating a flow meter on their permitted groundwater well(s).
- B. The Authority is responsible for procuring, installing, operating, and maintain the AMI system endpoint that is installed on the flow meter. Additionally, the Authority is responsible for integrating the meter into the Authority's automated billing system.
- C. Until the new meter has been integrated into the Authority's automated billing system, Well Owners must self-report meter readings into the Authority's Online Pumpage Reporting System (OPRS) and generating monthly bills through OPRS as described in the Authority's Rate Order.

1.03 REFERENCES

Well Owners should refer to the Authority's Rate Order located on the Authority's website for additional information (<https://www.nhcrwa.com/docs/water-rates-and-pumpage-fees/>).

This specification references the following publications in their current editions. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

- A. ANSI B 16.1 - Cast-Iron Pipe Flanges and Flanged Fittings.
- B. AWWA C 510 - Double Check Valve Backflow - Prevention Assembly.
- C. AWWA C 700 - Cold-Water Meters - Displacement Type.
- D. AWWA C 701 - Cold-Water Meters - Turbine Type for Customer Service.
- E. AWWA C 702 - Cold-Water Meters - Compound Type.

- F. AWWA C 703 - Cold-Water Meters - Fire Service Type.
- G. AWWA C 706 - Direct-Reading Remote Registration Systems for Cold-Water Meters.
- H. AWWA Manual M6 - Water Meters - Selection, Installation, Testing, and Maintenance.
- I. NSF/ANSI 61: Drinking Water System Components - Health Effects

1.04 SUBMITTALS

- A. At least 14 days prior to installation of a flow meter, Well Owners (or their designee) shall submit a proposed flow meter submittal package detailing the required items listed below. The Authority’s Program Manager shall provide written approval or denial of the proposed flow meter within five business days. Should an unapproved meter be installed, Well Owners will be required to purchase and install an approved meter.
- B. Submit the following under the provisions of Section 01330 – “Submittal Procedures:”
  - 1. Completed manufacturer’s data sheets, cut sheets, and catalog data
  - 2. Manufacturer’s written and illustrated instructions for the construction and installation method
  - 3. Instruction for handling and storage
  - 4. Dimensions and weight
  - 5. Manufacturer’s certifications
  - 6. Certified Test Reports for factory tests
  - 7. Shop Drawings
  - 8. Test Reports
  - 9. Operating Manuals
  - 10. Record Drawings
  - 11. Manufacturer’s Field Reports
- C. Product Data:
  - 1. Dimensional Drawings.
  - 2. Materials of Construction:
    - a. Sensor
    - b. Liner
    - c. Electrodes
    - d. Flanges
  - 3. Measurement accuracy
  - 4. Range and range ability
  - 5. Enclosure Rating
  - 6. Classification Rating
  - 7. Power:
    - a. Voltage.
    - b. Wattage.
  - 8. Output options
- D. Submit the following operation and maintenance data under the provisions of Section 01782 – “Operations and Maintenance Data.”

1. General: Operation and maintenance data shall cover the flow meter and all appurtenances.
2. Manufacturer bulletins for installing and dismantling the equipment including weights of major components
3. Manufacturer bulletins and manuals for operation and maintenance including schedule of routine checks and maintenance and troubleshooting guide.
4. Name, address and phone/fax numbers of local suppliers and manufacturer representatives of equipment.

1.05 RELATED REQUIREMENTS

- A. Section 01330 – “Submittal Procedures”
- B. Section 01782 – “Operations and Maintenance Data”
- C. Section 02515 – “Hydrostatic Testing of Pipelines”

1.06 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: System to comply with regulations of Texas Commission on Environmental Quality (TCEQ)

1.07 SYSTEM DESCRIPTION (NOT USED)

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials and equipment to jobsite with sufficient protection to ensure arrival in undamaged condition.
- B. All mechanical equipment to be stored on sleepers above grade and to be completely protected from damage and exposure to the elements until installation.
- C. Handle all components in accordance with manufacturer's instructions to prevent damage.
- D. Store all instruments in a dedicated structure with space conditioning to meet the recommended storage requirements provided by the manufacturer.
- E. Any instruments that are not stored in strict conformance with the manufacturer's recommendation shall be replaced.

1.09 PROJECT OR SITE CONDITIONS (not used)

1.10 WARRANTY

- A. The meter shall have a standard one-year warranty from installation.

- B. Provide the Authority with the manufacturer's warranty guaranteeing the flow meter(s) and associated equipment to be free from defects in workmanship and materials, under normal use and service.

1.11 MAINTENANCE (not used)

1.12 LIFE CYCLE MANAGEMENT

- A. Well Owners are responsible for annual calibration of all groundwater well flow meters and must provide documentation to the Authority upon request.

PART 2 PRODUCTS

2.01 METERS

- A. The meter shall be the propeller type or electromagnetic, 150-lb. working pressure, and shall be furnished with flanged tube, faced and drilled 125 lb.
- B. Provide manufacturer's unconditional guarantee for each sealed register against leakage, fogging, discoloration and stoppage for 15 years from date of installation.
- C. The meter tube shall be furnished with three straightening vanes directly upstream of the meter head assembly and shall be protected internally and externally with epoxy or suitable approved coating. The meter head shall be connected to the tube by means of a flanged connection designed for easy removal from the tube for inspection or repair. Meter shall maintain specified accuracy with valves, fittings or other obstructions at least five (5) pipe diameters upstream and three (3) pipe diameters downstream of the meter location. The meter tube shall have uniform inside diameter not less than nominal size of the meter required. Propeller meter head shall be furnished with conical-shaped 3-blade propeller, mounted transversely in the center of the meter tub. The meter head shall be designed to handle thrust at the front of the propeller support assembly to reduce wear and improve performance. The meter head shall be furnished with a 6-digit electronic totalizer, registering in units of 1,000 gallons, together with an electronic rate of flow indicator, reading in units of gallons per minute (GPM).
- D. The flow indicator shall be suitable for a required operations flow. The meter shall register within two percent (2%) of the true flow of water at all flows required for operation.
- E. Each meter shall be complete with transmitter to give 4-20 Ma analog signal and accessories to give remote flow readout, recording and totalizing. The register shall be hermetically sealed and protected by a suitable hinged cover.
- F. The meter shall be by Badger, Siemens, Water Specialties, or Pre-Approved Equal.
- G. Refer to the Authority's rate order for additional requirements for installed meters and remote meter reading devices. (<https://www.nhcrwa.com/docs/water-rates-and-pumpage->

[fees/](#)

- H. See attached list for available meters to respective meter size.

## 2.02 STRAINERS

- A. Displacement Potable Water Meters 5/8 inch through 2 inches: Self-straining by means of annular space between measuring chamber and external case or with strainer screens installed in meter. Provide rigid screens which fit snugly, are easy to remove, with an effective straining area at least double that of main case inlet.
- B. Potable Water Meters 2-inch diameter and larger: Equip with separate external strainer with bronze body for diameters less than 8 inches. Eight-inch diameter and larger may be cast iron, hot-dipped galvanized or epoxy coating. Strainers: Bolted to inlet side of meter, detachable from meter, easily removable lid. Strainer screen: Made of rounded cast bronze, stainless steel wire, having a nominal screen size of 3 1/2 mesh-per-inch (U.S. Series) not less than 45 percent clear area.
- C. Provide separate external strainers approved for use in fire service metered connections by Underwriters Laboratories. Bodies: Cast iron or copper alloy. Ends: Flanged in accordance with ANSI B 16.1, Class 125. Provide stainless steel basket. Strainers shall be detachable from meter. Manufacturers shall be by Badger, Hersey, Neptune, Sensus, or approved equal.

## PART 3 EXECUTION

3.01 GENERAL / MANUFACTURER(S) (not used)

3.02 PREPARATION (not used)

3.03 EXAMINATION (not used)

3.04 INSTALLATION AND CONSTRUCTION

- A. Flow meter installation: The Well Owner shall install the equipment as recommended by the manufacturer's installation and operation manual.

END OF SECTION

EXHIBIT 1:

NHCRWA Approved Water Meters

Note: All meters require the Badger Meter Orion Cellular Endpoint

<b>Mechanical Flow Meter</b>			
<b>Size</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Detailed Info</b>
1"	Badger Meter	Recordall M70 W/ HRE-LCD Encoder	
1.5"	Badger Meter	Recordall T-160 W/ HRE-LCD Encoder	Integral Strainer or Badger Meter Bronze Plate Strainer Required
2"	Badger Meter	Recordall T-200 W/ HRE-LCD Encoder	Integral Strainer or Badger Meter Bronze Plate Strainer Required
2"	Water Specialties	MLO4D-02 W/ FC101-08 Register	
3"	Badger Meter	Recordall T-450 W/ HRE-LCD Encoder	Integral Strainer or Badger Meter Bronze Plate Strainer Required
3"	Water Specialties	MLO4D-03 W/ FC101-08 Register	
4"	Badger Meter	Recordall T-1000 W/ HRE-LCD Encoder	Integral Strainer or Badger Meter Bronze Plate Strainer Required
4"	Water Specialties	MLO4D-04 W/ FC101-08 Register	
6"	Badger Meter	Recordall T-2000 W/ HRE-LCD Encoder	Badger Meter Bronze Plate Strainer Required
6"	Water Specialties	MLO4D-06 W/ FC101-08 Register	
8"	Badger Meter	Recordall T-3500 W/ HRE-LCD Encoder	Badger Meter Epoxy Coated Steel Plate Strainer Required
8"	Water Specialties	MLO4D-08 W/ FC101-08 Register	
10"	Badger Meter	Recordall T-5500 W/ HRE-LCD Encoder	Badger Meter Epoxy Coated Steel Plate Strainer Required
10"	Water Specialties	MLO4D-10 W/ FC101-08 Register	
12"	Water Specialties	MLO4D-12 W/ FC101-08 Register	
14"	Water Specialties	MLO4D-14 W/ FC101-08 Register	
16"	Water Specialties	MLO4D-16 W/ FC101-08 Register	
18"	Water Specialties	MLO4D-18 W/ FC101-08 Register	
20"	Water Specialties	MLO4D-20 W/ FC101-08 Register	

<b>Electromagnetic Flow Meters</b>			
<b>Size</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Detailed Info</b>
2"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
3"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
4"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
6"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
8"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
10"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
12"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
16"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings
20"	SIEMENS	MAG 8000	EPDM Liner, 115/230 V AC W/ Single Lithium Battery Backup, Basic Remote (16 Feet), Encoder Interface, (2) Grounding Rings