

Water Resources Commissioner

DIVISION OF OPERATIONS AND MAINTENANCE

Meter Operations

Sewage Flow Metering Equipment

DC POWERED ULTRASONIC FLOWMETER SYSTEM SPECIFICATIONS

This specification establishes standards to insure that all new Oakland County wastewater metering sites are compatible with the existing WRC wastewater metering system. Adherence to these standards will produce a durable metering site capable of providing reliable data. THEREFORE, NO EQUIPMENT OR MATERIAL SUBSTITUTIONS WILL BE ACCEPTED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE WRC CHIEF OF SEWER SYSTEMS.

Section I: ELECTRICAL POWER/TELEPHONE SERVICE INTERFACE PANEL

A. PANEL COMPONENTS:

- One (1), 0.250" thick 5052-H32 Marine Grade aluminum backplate, measuring 18" high X 24" wide.
- Two (2), panel legs, Unistrut or Beeline 1 5/8" deep channel, 8' in length.
- One (1), (Detroit Edison supplied) 100 Amp electrical meter can, (meter can style will vary with power feed, overhead or underground).
If underground feed, a 2" conduit to include a 90a EII mounted towards the electrical power source designated by Detroit Edison planner. The conduit shall terminate at a minimum depth of 18" below grade.
- One (1), 240V 60A electrical disconnect, Square D model #D222NRB with 30A fuses (FRN30).
- One (1) PVC or rigid 1" conduit to be installed between meter can and disconnect.
- One (1) PVC or rigid 1" conduit installed from disconnect to meter base for electrical load wiring. The 1" conduit shall be a continuous run between the disconnect and meter enclosure pad, (no direct burial cable will be accepted). The load wiring shall be #10 AWG THHN.
- One (1) PVC or rigid 3/4" conduit for telephone cable. The conduit to be installed from the power/phone interface panel to the meter enclosure pad shall be a continuous run, (no direct burial cable will be accepted).
- One (1), 8' grounding rod installed adjacent to panel and bonded to the panel by bare #6 AWG copper wire.

B. PANEL INSTALLATION DETAILS:

- The power/phone interface panel shall be installed close to the meter enclosure pad, as dictated by site conditions..
- The power/phone interface panel's legs shall be set in concrete to a depth no less than 42" below grade.
- The power/phone interface panel assembly and general layout shall conform with the Sewage Meter Enclosure details, Sheet 2 of 3, Detail "A" attached to this specification.

Section II: ENCLOSURE EQUIPMENT

The enclosure supplied must have the following components installed in conformance with Sewage Meter Enclosure details, Sheet 2 of 3, Detail "B" attached to this specification.

A. ENCLOSURE COMPONENTS:

- One (1), Hennessy Products all aluminum, single door enclosure part #LS583017. The enclosure supplied shall be complete with .0125 thick, 5052-H32 Marine Grade aluminum side and back panels. The side panel shall measure 50" high X 13.5" wide and the back panel shall measure 50" high X 27" wide. The switch door standard in the main enclosure door may be deleted. The enclosure shall include the optional full foil faced insulation package.
The LS583017 enclosure is available from:
Carrier & Gable
24110 Research Drive
Farmington Hills, MI 48335
(248) 477-8700
- One (1), 400 Watt strip heater, Chromalox model #CHROT1004PCN129701. The strip heater supplied shall be installed under a heavy expanded steel guard for safety and free air convection.
- One (1), Honeywell thermostat model #T498A1810, set to maintain a temperature of 45° F in the enclosure.
- One (1), electrical load center, Square D model #QO2-4L70S, equipped with two (2) GFCI breakers rated at 15 Amps each.
- One (1), Killark model #NVX15GG NEMA 3R ceiling light fixture complete with globe guard fitted with a 100 Watt light bulb.
- One (1), single pole switch for the enclosure light, housed in rain tight box and cover.
- One (1), grounded duplex outlet housed in a rain tight box with cover.
- One (1), telephone line junction box for interface between incoming telephone cable and the RJ-11 modular connector to the modem.
- One (1), phone line surge arrester, Joslyn model #2372-01 available from:
Campbell Scientific, Inc.
P.O. Box 551
Logan, UT 84321
(801) 753-2342

B. ENCLOSURE ASSEMBLY/INSTALLATION DETAILS:

- All secondary wiring for the enclosure equipment shall be #12 AWG THHN unless otherwise specified.
- All wiring in the enclosure shall be run inside PVC wiring duct.
- All wiring entries into instrument enclosures shall be fitted with cable gland seals.
- All conduit entries shall be as shown in Sewage Meter Enclosure details, Sheet 2 of 3, Detail "C", attached to this specification.
- All system wiring shall conform with Sewage Meter Enclosure details, Sheet 2 of 3, Detail "D" attached to this specification.
- The enclosure shall be mounted on a concrete pad as shown Sewage Meter Enclosure details, Sheet 2 of 3, Detail "C" attached to this specification.
- The system ground shall be an 8' ground rod, bonded to the enclosure.
- The 1" rigid conduit for flow and groundwater level transducer signal (run from the enclosure to the meter manhole), shall be fitted with seal, Killark model BY-2, at manhole. The sewer manhole end of the conduit run shall include a vertical drain prior to the seal, as shown in Sewage Meter Manhole Details, Sheet 3 of 3, Detail "E" attached to this specification.
- Sufficient ultrasonic and groundwater level transducer cable shall be left available to allow for maintenance.

C. ENCLOSURE ASSEMBLY REFERENCE STANDARDS

- NEMA
- Control panel shall carry UL label as assembled. Individual UL component labels are not sufficient.

Section III: INSTRUMENTATION

A. ULTRASONIC FLOWMETER:

- One (1), Inventron Ultrasonic 9140 flowmeter, consisting of controller and level transducer.
Controller: #9140-4mA-X-X-2CR-N4P-ED-VBE-HW-SB-X
Transducer: #9200-T100-1-NPVCX-PCL-X.
The manufacturer is:
Inventron
30927 Schoolcraft
Livonia, MI 48150
(734) 513-7700
- The ultrasonic level transducer shall be equipped with shielded cable as required by the site layout. THE CABLE LENGTH SHALL BE CALCULATED AS THE DISTANCE FROM THE METERING ENCLOSURE + 5' + METER MANHOLE DEPTH + (MANHOLE DIAMETER X 2) This formula will allow sufficient cable for installation and maintenance.
For example:
Distance from enclosure to manhole = 100'
Working length = 5'
Manhole depth = 20'
Manhole diameter = 8' 8 x 2 = 16'
Minimum required cable length = 141'
- The ultrasonic level transducer shall monitor the wastewater level through the Leopold-Lagoo flume at the point specified by the manufacturer of the flume.
- The ultrasonic level transducer cable shall enter the manhole in conduit. The conduit termination must include a seal, Appleton EYDM-100 with vertical drain, as shown in Sewage Meter Installation Details, Sheet 3 of 3, Detail "E", attached to this specification.
- The ultrasonic level transducer cable shall be coiled as shown in Sewage Meter Manhole Detail, Sheet 3 of 3, Detail "E". The transducer shall be covered to protect it from shock and abrasion.

B. DATA LOGGER/MODEM:

- One (1), Telog Instruments data logger, model #3308, supplied in the standard NEMA 3R lockable fiberglass Hoffman enclosure, and shall include a Druck 5 PSI pressure transducer to monitor groundwater level.
The manufacturer and local vendor are:
Telog Instruments Inc. RDP Corporation
830 Canning Parway 25882 Orchard Lake Road, Suite L7A
Victor, NY 14564 Farmington Hills, MI 48336-1292
(716) 742-3000 (248) 471-0685
- The data logger shall have four of the eight data channels configured for inputs as follows:
Channel #1: 4 - 20 mA for Flowmeter
Channel #2: 4 - 20 mA for power monitor
Channel #3: 4 - 20 mA for future use and testing
Channel #4: 5 PSI pressure transducer
- The length of groundwater level transducer cable supplied shall be calculated as described in Section III.A.3 above, and shall match the length of the ultrasonic level transducer cable. Both cables shall be installed in the same conduit run.
- The groundwater level transducer cable shall be coiled as shown in Sewage Meter Manhole Detail, Sheet 3 of 3, Detail "E". The pressure transducer shall be covered to protect it from shock and abrasion.

C. SUPPLY VOLTAGE MONITOR:

- One (1), Ohio Semitronics Voltage monitor, model number VTR-001E, with R.M.S. sensing feature, operating on 120 VAC, input range of 0-150 VAC and producing a 4-20 mA DC output scaled to the input range.
The voltage monitor is available from:
Ohio Semitronics
1205 Chesapeake
Columbus, OH 43212
(800) 537-6732.

Section IV: POWER CONVERSION SYSTEM

A. CHARGER/POWER SUPPLY:

- One (1), battery charger/power supply, the Truecharger 10. The Trucharger 10 operates on 120 VAC. The output is 10 amps maximum at 14 VDC. Charger/Power Supply output wiring shall be protected by two in-line fuses - a 5A fuse for the instrument circuit and a 30A fuse for the battery charger circuit.

The Truecharger is available from;

Kyocera Solar, Inc.
Rail Road Sales Division
941 Freeman Street
Genoa City, WI, 53128
(414) 279-5322

B. STANDBY/STORAGE BATTERIES:

- Three (3), batteries, Johnson Controls model #GC12V100B. The JC-GC12V100B is a maintenance free, gas recombinant, sealed lead acid, deep discharge capable design rated at 90 AH energy storage. Battery terminals shall be sealed from inadvertent contact by Mastic pads placed over the connections after supply wiring is installed.

The Johnson Controls model GC12V100B is available from the following vendor;

Kyocera Solar, Inc.
Rail Road Sales Division
941 Freeman Street
Genoa City, WI, 53128
(414) 279-5322

Section V: SYSTEM WARRANTY

- In addition to any component warranties, the entire wastewater metering system supplied shall be warranted free of defects in materials, workmanship, and installation for a period of one year by those submitting the flow metering system for acceptance by the WRC Division of Operations and Maintenance.
- The ultrasonic flowmeter warranty shall include all field service and/or repair of the system to maintain continuous operation during the warranty period.
- All system component warranties shall begin on the date of acceptance by WRC Division of Operations and Maintenance.

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1	lz	01/22/03	REMOVED AND ADDED NOTES
2			
3			
4			

SEWAGE METER ENCLOSURE DETAILS

ORIG. DATE:	01/05/01
SCALE:	NONE
DESIGNED BY:	JP/BB
DRAWN BY:	lz



ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFORD, MICHIGAN
48328-1907
SHEET NO.: 3 of 3