

APPENDICES

Sanitary Sewer Extension Forms	Appendix A
Water Line Extension Form	
Development – Water Supply & Demand Calculations	Appendix B
Water System Demand and Sanitary Sewer Contribution Form (Single Site Only)	Appendix AB
Water Meter Flow & Head Loss Design Information	Appendix C
Project Construction Cost Form	Appendix D
Sewer Flow Test Request Form	Appendix E
Water Flow Test Request Form	Appendix F
GDOT Encroachment Permit Check List	Appendix G
Sanitary Sewer Basin Map & WWTP Locations	Appendix H
Water System Pressure Zone Map	Appendix I
Development Plan Review Check List	DPRC-1 thru 2
Final Plat / Easement Plat Review Check List	PRC-1
As Built Review Check List	ARC-1

SANITARY SEWER EXTENSION SUBMITTAL FORM

Submitted for review pursuant Georgia Rules for Water Quality Control Chapter 391-3-6-.02(3)(a) are this form and attachments (as applicable):

- | | |
|--|---|
| <input type="checkbox"/> Project Description, design data
<input type="checkbox"/> Funding Source _____
<input type="checkbox"/> General map of proposed sewer extensions, outlined proposed service area, connection to the existing system, and flood plain contours and elevations if applicable
<input type="checkbox"/> Downstream Flow Schematic | <input type="checkbox"/> Plans (one copy)
<input type="checkbox"/> Specifications (one copy) |
|--|---|

Part I- General Information

- a. Name of local government Columbia County Board of Commissioners
- b. Local government official Mr. Billy Clayton, Director, or Mr. Eric Hinds, Manager
- c. Mailing Address P.O. Box 960

 City, County, State, Zip Code Grovetown, Columbia County, GA 30813
- d. Project name or identification _____
- e. Designing engineer(s) _____
- f. GA P.E. # _____ Expiration Date _____
- g. Mailing Address _____

 City, County, State, Zip Code _____

Part II. – Treatment System Information

- a. Wastewater treatment plant to which extensions are tributary
 Name _____
 Permit flow _____ MGD Current Peak Flow _____ MGD
 Permit # _____
- b. In the table below list the average daily flow (MGD) and effluent concentrations (mg/l) for biochemical oxygen demand (BOD₅), suspended solids (SS), Nitrogen (as NH₃), and phosphorus (P) for the last 12 months (preceding the sewer extension submittal) for the wastewater (from discharge monitoring reports).

Month	Flow	BOD ₅	SS	NH ₃	P	Month	Flow	BOD ₅	NH ₃	P	SS
January						July					
February						August					
March						September					
April						October					
May						November					
June						December					

SANITARY SEWER EXTENSION SUBMITTAL FORM

Part III- Project Information

- a. Name and address of the Developer. If not a local government please include a certified statement (as indicated in Section IV of this form).

Name

Mailing Address

City, County, State, Zip Code

- b. Proposed service area for this project.

Immediate _____ acres Ultimate _____ acres

- c. Type of developments: (check as applicable)

Industrial _____ Residential _____ Commercial _____

Other _____ (explain) _____

- d. Population to be served

Population _____ Density/acre _____

- e. Per capita wastewater contribution

Average _____ GPD Peak _____ GPD

- f. If receiving industrial wastewater, describe industrial waste characteristics.

Quantity _____ GPD. Describe pretreatment received (if any)

(use extra sheet if needed)

- g. Average Design Flow (this project) _____ GPD Peak _____ GPD
or max. pipe capacity _____

- h. Design BOD (this project)

Average _____ lbs/day

SANITARY SEWER EXTENSION SUBMITTAL FORM

i. List nominal pipe diameter(s) and length

j. List number, size and type of pump stations (if any)

Please submit design calculations with this form. Include system head calculations; pump curves, system curves, and buoyancies calculations, etc.

Part IV- Certification

a. Provide the name of the Georgia P.E. that the project inspector will report to:

_____ Georgia P.E. # _____

b. Provide the name of the local government who will own and maintain the proposed sewers if it is different from the authority responsible for treatment of wastewater from this project.

c. As the authority responsible for the treatment of wastewater from this project, I certify that: a) this project has been reviewed, b) the existing system has adequate transport and treatment capacity to treat wastewater generated from this project, c) we are willing to accept the project wastewater for treatment; d) that the sewers are not constructed on or serving structures constructed or proposed to be constructed on solid waste landfills; and e) we are willing to accept ownership and maintain the proposed sewers.

To the best of my knowledge, I certify that the above information is true and correct.

Signature _____

Responsible Local Official

Name (Print) _____

Title or Position _____

Date _____

Please provide any additional comments on a separate sheet of paper.

Submit completed form to: **DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
WASTEWATER REGULATORY PROGRAM
2 MARTIN LUTHER KING, JR. DRIVE, SUITE 1152 EAST
ATLANTA, GEORGIA 30334**

SANITARY SEWER EXTENSION SUBMITTAL FORM

Information Sheet

The following information is provided to help you understand the reasons that a form must be completed and accompany each sanitary sewer extension request.

Question: Why is a form needed?

Answer: To enable us to process the extension request efficiently and to let us know if further review information is needed.

Question: How does one complete the form?

Answer: Answer each question in the space provided and refer to the checklist when appropriate. Below are brief explanations of the information is required.

Part I Provide the name of the local government in which the proposed sewer extension will be located. Provide the name of the local government official to whom the correspondence should be addressed.

Provide the name of firm, which prepares the sewerage plans and specifications and the name of the Georgia registered professional engineer who signed the plans.

Part II Provide the name of the wastewater treatment facility to which the proposed sewer extension(s) will be tributary. Provide wastewater treatment plant permitted flow in million gallons per day to the wastewater treatment facility listed in Part II.

From the discharge monitoring reports for the wastewater treatment facility, for the months listed, provide the flow, biochemical oxygen demand (BOD₅), suspended solids (SS), Nitrogen (NH₃), and Phosphorus (P) for the 12 months preceding the sewer extension submittal.

Part III Provide the name and address of the developer (firm) requesting the sewer extension. If the party responsible for initiating the sewer extension request is not a local government, a certified statement will be required.

Immediate acres to be served by this project includes development directly tributary to the proposed sewer extension. Ultimate acres to be served by this project includes development that will be tributary to the proposed sewer extension in the future.

Population density for the immediate service area should be listed. Dividing the population served by the immediate acres should equal the density per acre.

Average gallons per day per capita wastewater contribution should be based on realistic, preferably documentable data for residential development and documentable, equivalent flows for commercial and industrial development. The peaking factor should reflect documentable flow data for the appropriate types of development.

List pollutants and their concentration in mg/L and quantity in gallons per day of industrial wastewater discharging to the proposed sewer extension. Briefly describe the industrial pretreatment process employed.

Provide the average flow in gallons per day for the proposed sewer extension for the immediate service area. The second blank shows either the capacity of the sewer pipe for the proposed sewer extension or the ultimate flow in gallons per day if it is less than the pipe capacity.

Biochemical oxygen demand (5-day) for the immediate service area.

SANITARY SEWER EXTENSION SUBMITTAL FORM

Provide a list of nominal pipe diameters to be used in this project in this blank (8-inch, 12-inch, etc.).

Part IV

Provide the name of the Georgia registered professional engineer who the project inspector will report to. If the project inspector is a Georgia registered professional engineer, list the name of the project inspector.

EPD requires all sewers to be owned and maintained by the local government to which the extensions are tributary.

The local government with in-house sanitary engineering capability must review and approve the plans and specifications and provide downstream flow schematics. The local government (with no in-house sanitary engineering capability) must provide a certified statement that it is willing to accept the project wastewater for treatment and ownership of the sewers and pump stations. The local government must certify that the proposed sewers are not constructed on or serving structures constructed or proposed to be constructed on solid waste landfills.

**Columbia County Water Utility
Water Line Extension Form
Development – Water Supply & Demand Calculations**

Name of Developer: _____

Project Name & Location: _____

Type of Development: _____ Zoning: _____

Number of Proposed Lots: _____ gpm per Lot: _____ District: _____

Number of Lots Previously Approved but not yet Constructed: _____ gpm per Lot: _____

Required Fire Flow: _____ (gpm)

Size(s) of Water Main in Project: _____ (inches) Total Length: _____ (feet) Material: _____

_____ (inches) Total Length: _____ (feet) Material: _____

_____ (inches) Total Length: _____ (feet) Material: _____

Flow Test Information:

a) Static Pressure (point of tie-in): _____ (psi) at _____ elevation Size of Water Main at Tie-in: _____

b) Maximum Elevation in Development: _____ (feet)

c) Flow Available: _____ (gpm) at _____ (psi) residual, at the point of tie-in.

d) Date of Flow Test: _____ Test Performed By: _____

Include all 24-hour pressure test results for projects connecting to existing systems. Flow test cannot be more than 6 months old.

The Columbia County Water Supply System can sufficiently supply the requirements of this subdivision **as well as those previously approved and not yet constructed**. Water main material and size within the project area are adequate to meet minimum pressure requirements of 20psi at peak demand. The water system will be owned, operated and maintained by the Columbia County Water Utility Department.

Wastewater for this Project will be handled by: Septic Tank: or Sewer System: (check one)

Professional Engineer Information

Name of Design Firm _____

Name of Design Engineer: _____ GA P.E. # _____ Expiration Date _____

Mailing Address: _____

P.E. Signature

Date

Authorized Representative:

Name Signature Title Date

Pressure System (Zone) _____

**Columbia County Water Utility
Engineering Department**

**Water System Demand &
Sanitary Sewer Contribution Form**
(Single Site Only)

Date: _____

Project Name: _____

Location of Development: _____

Name Design Engineer: _____ GA PE # _____

PE Signature: _____

Water

Estimated Domestic Water Demand gallons per minute (gpm): _____

Estimated Irrigation Water Demand gallons per minute (gpm): _____

Estimated Peaking **Factor** Water: _____

Sanitary Sewer

Estimated Sanitary Sewer Contribution gallons per day (gpd): _____

Estimated Peaking **Factor** Sewer: _____

Please note for daily or business hour usages accordingly. Flows must reflect an actual amount contributing to the system. For example, businesses operating from 9am to 5pm, Monday through Friday. Gallons per Day equal the number of gallons contributing within a 24 hour period.

Sanitary Sewer Basin: _____

See Appendix H for Basin Map Information

APPENDIX C

Water Meter Flow and Head Loss Design Information

iPERL™ Water Management System

Electromagnetic Flow Measurement System

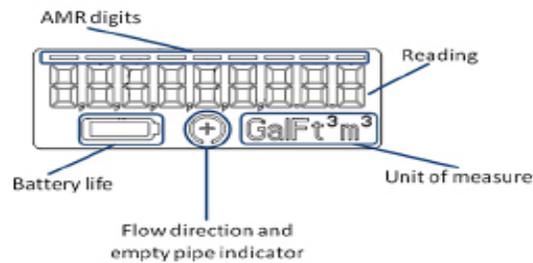
Description

5/8" (DN 15mm), 3/4" (DN 20mm) and 1" (DN 25mm) Sizes

With no moving parts, the Sensus iPERL water management system is based on innovative electromagnetic flow measurement technology. The iPERL system family has an operating range as low as 0.03 gpm (0.007 m³/hr) to 55 gpm.



Electronic Register LCD Display



Features

CONFORMANCE TO STANDARDS

The iPERL system far exceeds the most recent revision of ANSI/AWWA Standard C-700 and C-710 for accuracy and pressure loss requirements. All iPERL systems are NSF/ANSI Standard 61 Annex F and G compliant and tested to AWWA standards.

PERFORMANCE

The patented measurement technology of the iPERL system allows enhanced accuracy ranges at both low and high flows and perpetual accuracy over the life of the product and can be installed horizontally, vertically or diagonally.

CONSTRUCTION

The iPERL system is an integrated unit that incorporates an electronic register and measuring device encased in an external housing. The measuring device is comprised of a composite alloy flowtube with externally-threaded spud ends. Embedded in the flowtube are

magnetic flow sensors. The all electronic, programmable register is hermetically sealed with a tempered glass cover. The iPERL system has a 20 year life cycle, along with a 20 year battery life guarantee.

ELECTRONIC REGISTER

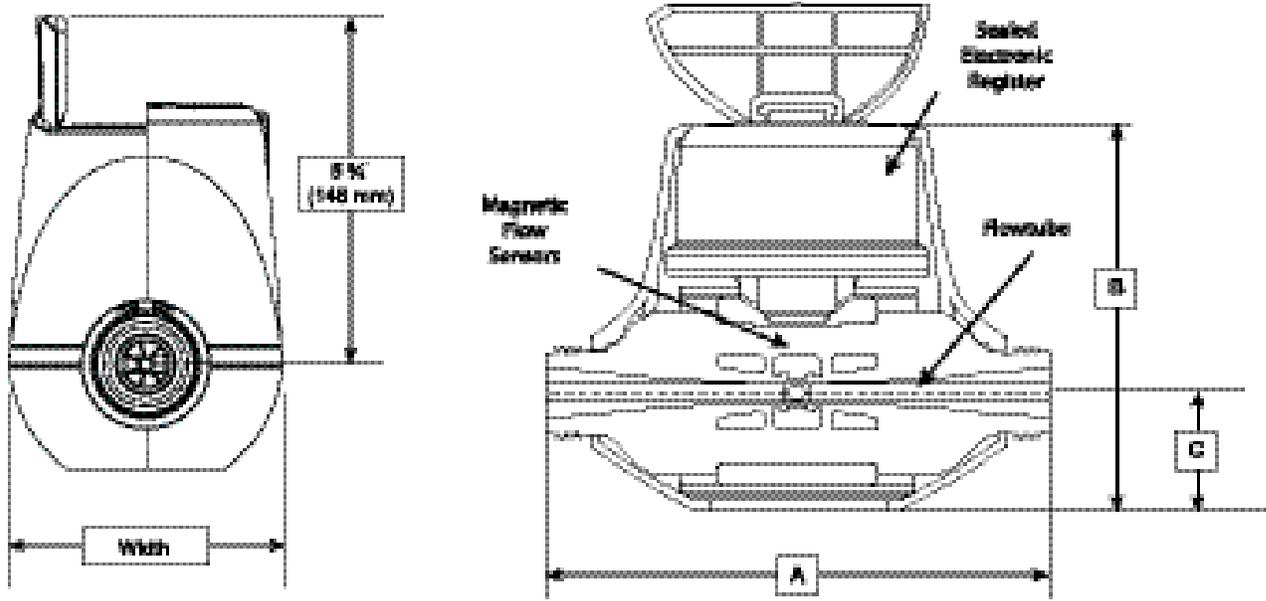
The high resolution 9-digit hermetically sealed electronic register with LCD display was designed to eliminate dirt, lens fogging issues and moisture contamination in pit settings with built in tamper protection. The tempered glass register cover displays readings with the AMR digits highlighted. Direction of flow and units of measure are also easily readable on the register display. The iPERL register features; AMR resolution and unit of measure that are fully programmable, integral customer data logging compatible with UniPro software tools. The large, easy to read display also includes battery life, empty pipe and forward/reverse flow indicators.

TAMPERPROOF FEATURES

The integrated construction of the iPERL system prevents removal of the register to obtain free water. The magnetic tamper and low field alarms will both indicate any attempt to tamper with the magnetic field of the iPERL system.

AMR / AMI SYSTEMS

iPERL systems are compatible with current Sensus AMR/AMI systems.



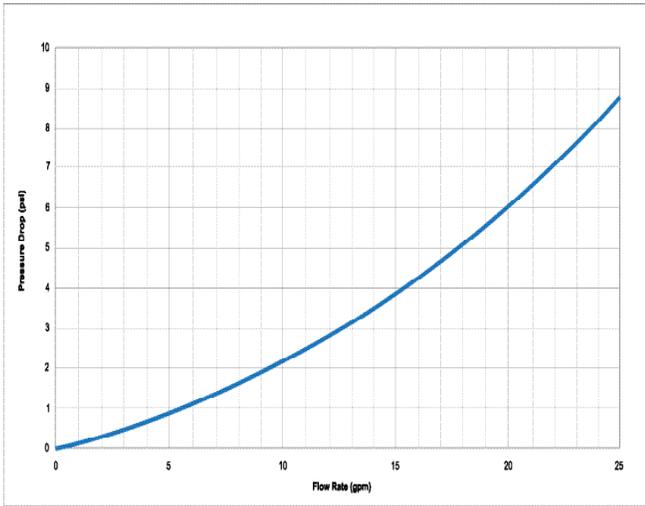
DIMENSIONS AND NET WEIGHTS

Size	A (lay length)	B	C	Spud Ends	NPSM Thread Size	Width	Net Weight
3/4" S (5/8" x 3/4") (DN 20 mm)	7-1/2" (190 mm)	6-1/10" (155 mm)	1-3/4" (44 mm)	3/4" (20 mm)	1" (25 mm)	4-1/2" (114 mm)	3.1 lb. (1.4 kg)
1" (DN 25 mm)	10-3/4" (273 mm)	6-1/10" (155 mm)	1-3/4" (44 mm)	1" (25 mm)	1-1/4" (32 mm)	4-1/2" (114 mm)	3.3 lb. (1.6 kg)

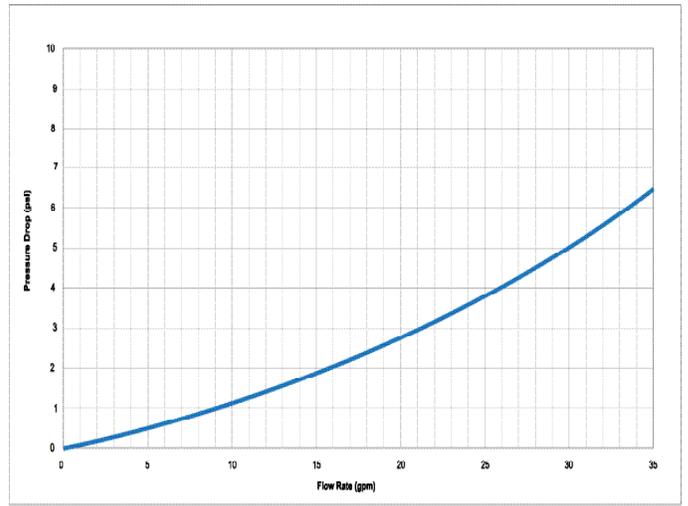
SPECIFICATIONS

SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 °F (0.56 °C) - 150 °F (65.6 °C)	MEASUREMENT TECHNOLOGY	Solid state electromagnetic flow
NORMAL OPERATING FLOW RANGE (±1.5%)	5/8" (DN 15mm) size: 0.18 to 25 gpm (0.04 to 5.7 m³/hr) 3/4" (DN 20mm) size: 0.18 to 35 gpm (0.04 to 8.0 m³/hr) 1" (DN 25mm) size: 0.4 to 55 gpm (0.09 to 12.5 m³/hr)	REGISTER	Hermetically sealed, 9-digit programmable electronic register AMR/AMI compatible iPERL system register programmable using the UniPro programming package
LOW FLOW RANGE (±3%)	5/8" (DN 15mm) size: >0.11 gpm (0.025 m³/hr) to <0.18 gpm (0.041 m³/hr) 3/4" (DN 20mm) size: >0.11 gpm (0.025 m³/hr) to <0.18 gpm (0.041 m³/hr) 1" (DN 25mm) size: >0.3 gpm (0.068 m³/hr) to <0.4 gpm (0.09 m³/hr)	MATERIALS	External housing – Thermal plastic Flowtube – Polyphenylene sulfide alloy Electrode – Silver/silver chloride Register cover – Tempered glass
STARTING FLOW	5/8" (DN 15mm) size: 0.03 gpm (0.007 m³/h) 3/4" (DN 20mm) size: 0.03 gpm (0.007 m³/h) 1" (DN 25mm) size: 0.11 gpm (0.025 m³/h)	ALARM DEFAULTS	Alarm Duration – 90 days Leak Duration – 24 hours Datalog Interval – 1 hour Alarm Mask – All alarms reported History Mask – All event types reported
MAXIMUM OPERATING PRESSURE	200 psi (13.8 bar)		

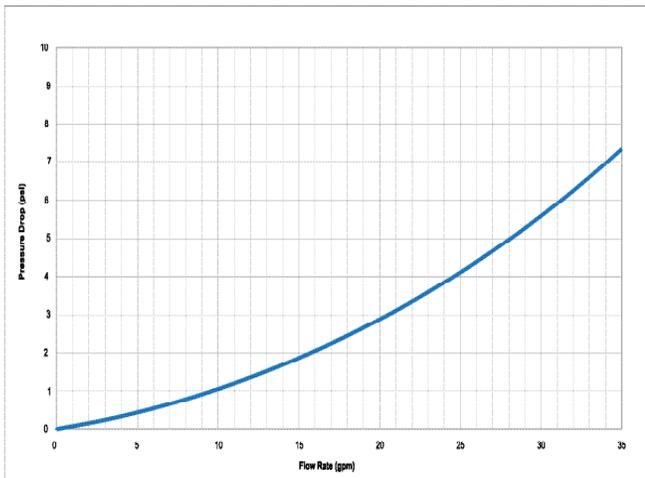
HEADLOSS CURVES



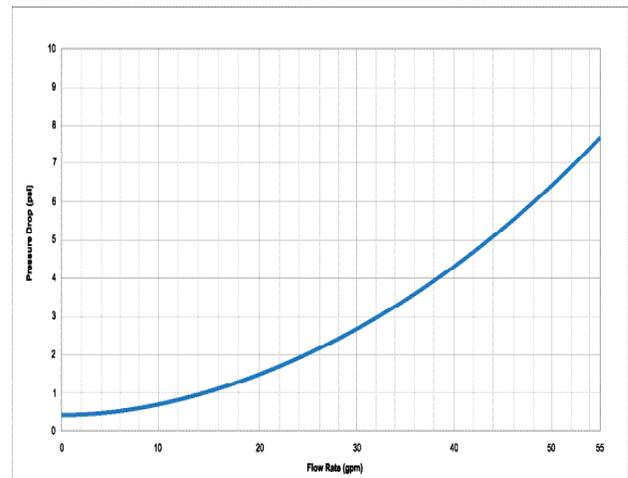
5/8" Headloss Curve



3/4" Short Headloss Curve



3/4" Headloss Curve



1" Headloss Curve

© All products purchased and services performed are subject to Sensus' terms of sale, available at either; <http://na.sensus.com/TC/TermsConditions.pdf> or 1-800-647-3748. Sensus reserves the right to modify these terms and conditions in its own discretion without notice to the customer.

This document is for informational purposes only, and SENSUS MAKES NO EXPRESS WARRANTIES IN THIS DOCUMENT. FURTHERMORE, THERE ARE NO IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. ANY USE OF THE PRODUCTS THAT IS NOT SPECIFICALLY PERMITTED HEREIN IS PROHIBITED.

4", 6", 8" and 10" Sizes (UL Listed and FM Approved)

SCOPE

These specifications set forth the minimum acceptable design criteria and performance requirements for cold water meters - Fire Service type consisting of a Class II turbine type meter, and a ductile iron strainer assembly. This meter assembly is intended where an extremely wide flow range is required and where measurement of both domestic and fire service water usage is desired.

CONFORMANCE TO STANDARDS

The meter package shall meet or exceed all requirements of AWWA Standard C703 for Class II. The measuring shall be so configured to capture all flows as specified, without the requirement of an automatic valve. Each meter assembly shall be performance tested to ensure compliance.

Each meter package shall meet or exceed all requirements of NSF/ANSI Standard 61, Annex F and G.

MAINCASES

The meter maincase shall be of an epoxy coated iron composition. The epoxy coating shall be provided as standard fusion-bonded and adhere to NSF for non-lead regulation compliance.

PERFORMANCE

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum headloss through the meter / strainer assembly shall not exceed those listed in the following table per meter size.

OPERATING CHARACTERISTICS

Meter Size	Low Flow (95% Min.)	Operating Range (98.5 - 101.5%)	Intermittent Flows (98.5 - 101.5%)	Pressure Loss (Not to Exceed)
4"	0.75 GPM	1.5 to 1000 GPM	1250 GPM	6.4 PSI @ 1000 GPM
6"	1.5 GPM	3.0 to 2000 GPM	2500 GPM	6.7 PSI @ 2000 GPM
8"	2.5 GPM	4 to 3500 GPM	4700 GPM	5 PSI @ 3500 GPM
10"	3.5 GPM	5 to 5500 GPM	7000 GPM	7 PSI @ 5500 GPM

MEASURING CHAMBER

The measuring chamber shall consist of a measuring element, removable housing, and all-electronic register. The measuring element shall be mounted on a horizontal, stationary titanium shaft with sleeve bearings and be essentially weightless in water. The measuring element comes integrated with the advanced Floating Ball Technology design. The measuring chamber shall be capable of operating within the above listed accuracy limits without calibration when transferred from one maincase to another of the same size. The measuring shall be so configured to capture all flows as specified above, without the requirement of an automatic valve.

DIRECT MAGNETIC DRIVE SYSTEM

The direct magnetic drive shall occur between the motion of the measuring element blade position and the electronic register. The OMNI direct drive system with Floating Ball Technology is designed to extend service life, enhance low flow sensitivity and provide extended flow capacity and overall accuracy of the meter assembly. Additional intermediate, magnetic or mechanical, drive couplings are not acceptable.

ELECTRONIC REGISTER

The meter's register is all-electronic and does not contain any mechanical gearing to display flow and accurate totalization. The electronic register includes the following partial list of features:

- AMR resolution units fully programmable
- Pulse output frequency fully programmable
- Integral data logging capability
- Integral resettable accuracy testing feature
- Large, easy-to-read LCD display
- 10-year battery life guarantee

MAXIMUM OPERATING PRESSURE

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 175 pounds per square inch (psig).

STRAINERS

Each meter assembly shall have a separate UL (Underwriters Laboratories) Listed and FM (Factory Mutual) approved external fire service strainer as a part of the meter package. The strainer's screen shall have a minimum net open area of at least four (4) times the pipe opening and be a V-shaped stainless steel screen for the purpose of obtaining a full unobstructed flow pattern. The strainer body shall be coated iron with stainless steel fasteners capable of maintaining the following static pressure ratings and physical dimensions:

Meter Size	Maximum Working Pressure	Centerline to Strainer Base	Compact Overall Length (Not to Exceed)	Standard Overall Length (Not to Exceed)
4"	175 PSIG	4-3/4 INCHES	33 INCHES	██████████
6"	175 PSIG	5-3/4 INCHES	45 INCHES	██████████
8"	175 PSIG	6-3/4 INCHES	53 INCHES	██████████
10"	175 PSIG	8-1/2 INCHES	68 INCHES	██████████

STRAIGHTENING VANES

A straightening vane assembly is mandatory and shall be positioned directly upstream of the measuring element. The straightening vane assembly shall be an integral component of the measuring chamber.

CONNECTIONS

The meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

CERTIFICATIONS AND MARKINGS

All sizes of meter packages shall be UL (Underwriters Laboratories) Listed and FM (Factory Mutual) approved as being accepted for use on fire service lines and domestic water use. For such applications, the meter shall have a UL/FM listed and approved strainer immediately upstream of the inlet flange. The meter shall have an identification tag affixed indicating such acceptance and the strainer shall also bear such acceptance symbols and markings on the casting.

GUARANTEE AND MAINTENANCE PROGRAM

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange.

INTENT

Subject meter specifications are designed to establish minimum guidelines for selecting an extremely critical metering device. Areas of concern to be evaluated in the selection process include, but are not limited to, ease of installation, operational features and benefits, readability and future system maintenance expense. A design, which reflects longevity of proper operation in all elements and high degree of sustained accuracy within the entire range of the meter assembly, is to be considered mandatory. Enhanced accuracy levels and performance are desired and should not be compromised.

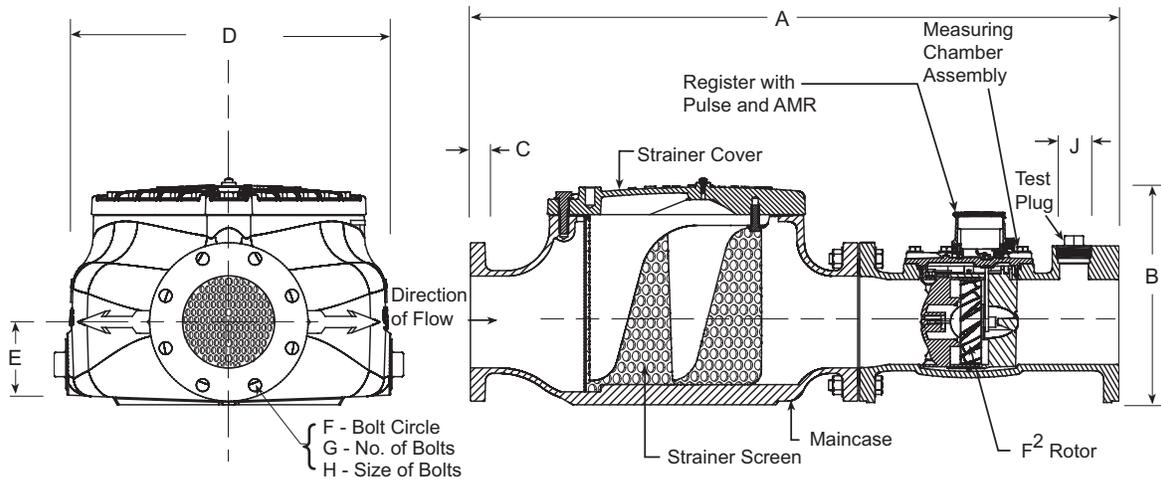
RECOMMENDATION

Sensus OMNI F² Meter.

© All products purchased and services performed are subject to Sensus' terms of sale, available at either; <http://na.sensus.com/TC/TermsConditions.pdf> or 1-800-METER-IT. Sensus reserves the right to modify these terms and conditions in its own discretion without notice to the customer.

This document is for informational purposes only, and SENSUS MAKES NO EXPRESS WARRANTIES IN THIS DOCUMENT. FURTHERMORE, THERE ARE NO IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. ANY USE OF THE PRODUCTS THAT IS NOT SPECIFICALLY PERMITTED HEREIN IS PROHIBITED.

OMNI F²: 4", 6", 8" and 10"



DIMENSIONS AND NET WEIGHTS

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight	Standard Fireline
4" DN 100mm	1.5 gpm .34 m ³ /hr	1000 gpm 227 m ³ /hr	Flanged	33" 838mm	13-11/16" 348mm	15/16" 24mm	17-1/2" 446mm	4-3/4" 121mm	7-1/2" 191mm	8	5/8" 16mm	2" 50mm	212 lbs. 96 kg.	252 lbs. 115 kg.	
6" DN 150mm	3.0 gpm .681 m ³ /hr	2000 gpm 454 m ³ /hr	Flanged	45" 1143mm	15-3/4" 400mm	15/16" 24mm	22-3/8" 569mm	5-3/4" 146mm	9-1/2" 242mm	8	3/4" 19mm	2" 50mm	394 lbs. 179 kg.	449 lbs. 204 kg.	
8" DN 200mm	4 gpm .91 m ³ /hr	3500 gpm 795 m ³ /hr	Flanged	53" 1346mm	18-1/2" 470mm	11/16" 17mm	31" 787mm	6-3/4" 172mm	11-3/4" 298mm	8	3/4" 19mm	2" NPT	736 lbs. 334 kg.	786 lbs. 357 kg.	
10" DN 250mm	5 gpm 1.1 m ³ /hr	5500 gpm 1249 m ³ /hr	Flanged	68" 1727mm	22-1/4" 565mm	11/16" 17mm	37-1/3" 947mm	8-1/2" 216mm	14-1/4" 362mm	12	7/8" 22mm	2" NPT	1155 lbs. 524 kg.	1215 lbs. 551 kg.	

*Standard Fireline lay length with optional spool piece added.

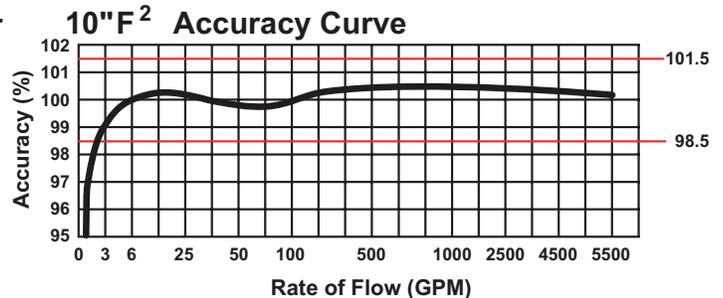
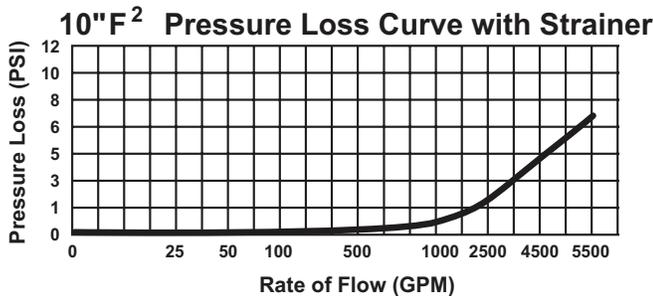
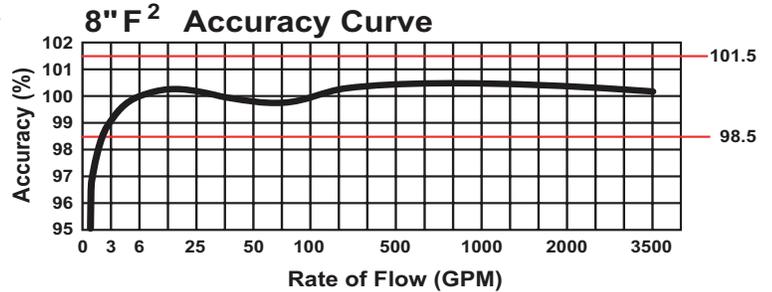
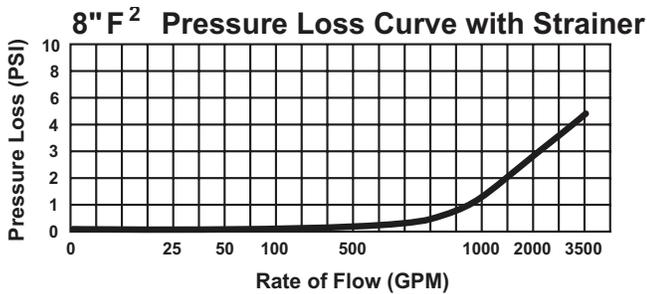
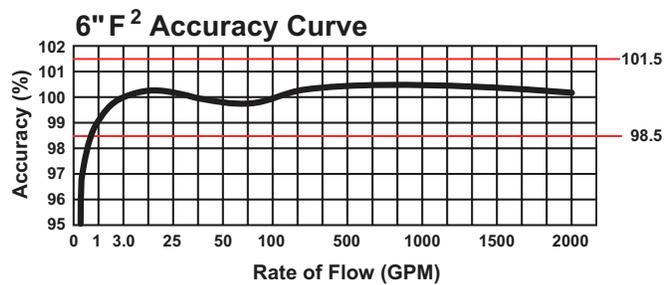
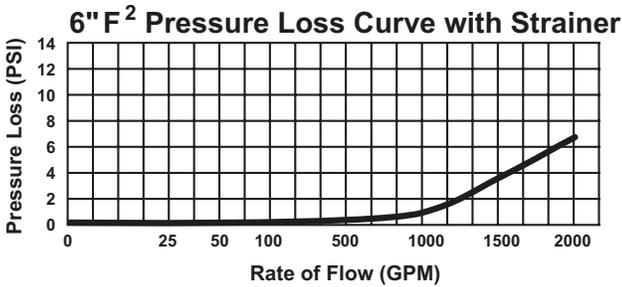
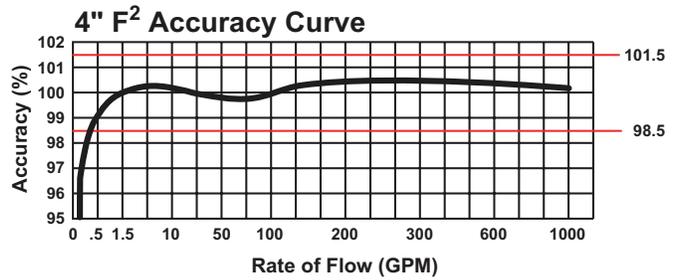
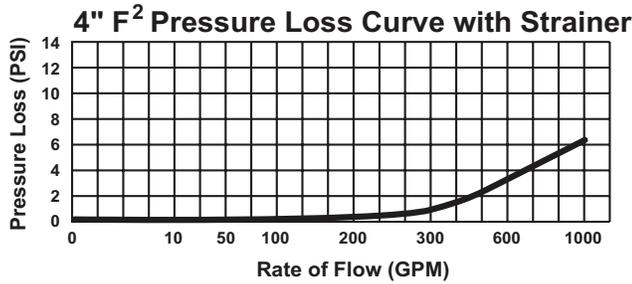
SPECIFICATIONS

SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 °F (56 °C) - 150 °F (65.6 °C)
OPERATING RANGE (100% ± 1.5%)	4": 1.5 – 1000 GPM (.34 - 227 m ³ /hr) 6": 3.0 – 2000 GPM (.34 - 227 m ³ /hr) 8": 4 – 3500 GPM (0.91-795 m ³ /hr) 10": 5 – 5500 GPM (1.1-1249 m ³ /hr)
LOW FLOW (95% – 101.5%)	4": .75 GPM (.06 m ³ /hr) 6": 1.5 GPM (.06 m ³ /hr) 8": 2.5 GPM (0.57 m ³ /hr) 10": 3.5 GPM (0.8 m ³ /hr)
UL MINIMUM FLOW	8": 97% @ 3 GPM (0.68 m ³ /hr) 10": 97% @ 4 GPM (0.9 m ³ /hr)
MAXIMUM CONTINUOUS OPERATION	4": 1000 GPM (227 m ³ /hr) 6": 2000 GPM (454 m ³ /hr) 8": 3500 GPM (795 m ³ /hr) 10": 5500 GPM (1249 m ³ /hr)
MAXIMUM INTERMITTENT OPERATION	4": 1250 GPM (284 m ³ /hr) 6": 2500 GPM (568 m ³ /hr) 8": 4700 GPM (1067 m ³ /hr) 10": 7000 GPM (1590 m ³ /hr)

PRESSURE LOSS	4": 6.4 psi @ 1000 GPM (.60 bar @ 227 m ³ /hr) 6": 6.7 psi @ 2000 GPM (.56 bar @ 454 m ³ /hr) 8": 5 psi @ 3500 GPM (.34 bar @ 795 m ³ /hr) 10": 7 psi @ 5500 GPM (.48 bar @ 1249 m ³ /hr)																		
MAXIMUM OPERATING PRESSURE	175 PSI (12 bar)																		
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125																		
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Ft./ Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life																		
NSF APPROVED MATERIALS	<table border="0"> <tr> <td>Maincase:</td> <td>Coated Ductile Iron</td> </tr> <tr> <td>Measuring Chamber:</td> <td>Thermoplastic</td> </tr> <tr> <td>Rotor "Floating Ball":</td> <td>Thermoplastic</td> </tr> <tr> <td>Radial Bearings:</td> <td>Hybrid Thermoplastic</td> </tr> <tr> <td>Thrust Bearings:</td> <td>Sapphire/Ceramic Jewel</td> </tr> <tr> <td>Magnets:</td> <td>Ceramic Magnet</td> </tr> <tr> <td>Strainer Screen:</td> <td>Stainless Steel</td> </tr> <tr> <td>Strainer Cover:</td> <td>Coated Ductile Iron</td> </tr> <tr> <td>Test Plug:</td> <td>Coated Ductile Iron</td> </tr> </table>	Maincase:	Coated Ductile Iron	Measuring Chamber:	Thermoplastic	Rotor "Floating Ball":	Thermoplastic	Radial Bearings:	Hybrid Thermoplastic	Thrust Bearings:	Sapphire/Ceramic Jewel	Magnets:	Ceramic Magnet	Strainer Screen:	Stainless Steel	Strainer Cover:	Coated Ductile Iron	Test Plug:	Coated Ductile Iron
Maincase:	Coated Ductile Iron																		
Measuring Chamber:	Thermoplastic																		
Rotor "Floating Ball":	Thermoplastic																		
Radial Bearings:	Hybrid Thermoplastic																		
Thrust Bearings:	Sapphire/Ceramic Jewel																		
Magnets:	Ceramic Magnet																		
Strainer Screen:	Stainless Steel																		
Strainer Cover:	Coated Ductile Iron																		
Test Plug:	Coated Ductile Iron																		

OMNI F²: 4", 6", 8" and 10"

Headloss Curves



© All products purchased and services performed are subject to Sensus' terms of sale, available at either; <http://na.sensus.com/TC/TermsConditions.pdf> or 1-800-METER-IT. Sensus reserves the right to modify these terms and conditions in its own discretion without notice to the customer.

This document is for informational purposes only, and SENSUS MAKES NO EXPRESS WARRANTIES IN THIS DOCUMENT. FURTHERMORE, THERE ARE NO IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. ANY USE OF THE PRODUCTS THAT IS NOT SPECIFICALLY PERMITTED HEREIN IS PROHIBITED.

1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

SCOPE

These specifications set forth the minimum acceptable design criteria and performance requirements for Turbine-type cold water meters including the following potential service applications and general considerations:

- Intended where a moderately wide flow range is anticipated
- Measurement of water usage for typical billing applications
- Measurement intended for typical commercial and industrial applications
- Measurement of low flow usage above OMNI C² Meter threshold levels
- Measurement of constant medium to extended high flow usage

CONFORMANCE TO STANDARDS

The meter package shall meet or exceed all requirements of ANSI/AWWA Standard C701 for Class II turbine meter assemblies. Each meter assembly shall be performance tested to ensure compliance.

The meter package shall meet or exceed all requirements of NSF/ANSI Standard 61, Annex F and G.

MAINCASES

The meter maincase shall be of epoxy coated ductile iron composition. The epoxy coating shall be provided as standard fusion-bonded and adhere to NSF for non-lead regulation compliance.

PERFORMANCE

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum headloss through the meter/strainer assembly shall not exceed those listed in the following table per meter size.

OPERATING CHARACTERISTICS

Meter Size	Low Flow (95% Min.)	Operating Range (98.5 - 101.5%)	Intermittent Flows (98.5 - 101.5%)	Pressure Loss (Not to Exceed)
1-1/2"	.75 GPM	1.25 to 160 GPM	200 GPM	6.9 PSI @ 160 GPM
2"	1.0 GPM	1.5 to 200 GPM	250 GPM	7.0 PSI @ 200 GPM
3"	1.5 GPM	2.5 to 500 GPM	650 GPM	5.1 PSI @ 500 GPM
4"	2.0 GPM	3.0 to 1000 GPM	1250 GPM	8.7 PSI @ 1000 GPM
6"	2.5 GPM	4.0 to 2000 GPM	2500 GPM	8.2 PSI @ 2000 GPM
8"	4 GPM	5 to 3500 GPM	4700 GPM	5.1 PSI @ 3500 GPM
10"	5 GPM	6 to 5500 GPM	7000 GPM	7.2 PSI @ 5500 GPM

MEASURING CHAMBER

The measuring chamber shall consist of a measuring element, removable housing, and all-electronic register. The measuring element shall be mounted on a horizontal, stationary stainless steel shaft with sleeve bearings and be essentially weightless in water. The measuring element comes integrated with the advanced Floating Ball Technology design. The measuring chamber shall be capable of operating within the above listed accuracy limits without calibration when transferred from one maincase to another of the same size. The measuring shall be so configured to capture all flows as specified above.

DIRECT MAGNETIC DRIVE SYSTEM

The direct magnetic drive shall occur between the motion of the measuring element blade position and the electronic register. The OMNI direct drive system with Floating Ball Technology is designed to extend service life, enhance low flow sensitivity and provide extended flow capacity and overall accuracy of the meter assembly. Any and all additional intermediate, magnetic or mechanical, drive couplings are not acceptable.

ELECTRONIC REGISTER

The meter's register is all-electronic and does not contain any mechanical gearing to display flow and accurate totalization. The electronic register includes the following partial list of features:

- AMR resolution units fully programmable
- Pulse output frequency fully programmable
- Integral data logging capability
- Integral resettable accuracy testing feature
- Large, easy-to-read LCD display
- 10-year battery life guarantee

MAXIMUM OPERATING PRESSURE

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 200 pounds per square inch (psig).

STRAINERS

The meter strainer shall be integral and cast as part of the meter’s maincase. The strainer’s screen shall have a minimum net open area of at least two (2) times the pipe opening and be a V-shaped configuration for the purpose of maintaining a full unobstructed flow pattern. The strainer body shall be a coated ductile iron fusion-bonded epoxy identical to that of the meter’s maincase. All fasteners shall be stainless steel capable of maintaining the following static pressure ratings and physical dimensions:

Meter Size	Maximum Operating Pressure	Centerline to Strainer Base	Overall Length (Not to Exceed)
1-1/2"	200 PSIG	2-5/16 INCHES	13 INCHES
2"	200 PSIG	2-5/16 INCHES	17 INCHES
3"	200 PSIG	4-1/8 INCHES	19 INCHES
4"	200 PSIG	4-3/4 INCHES	23 INCHES
6"	200 PSIG	5-3/4 INCHES	27 INCHES
8"	200 PSIG	6-3/4 INCHES	30-1/8 INCHES

STRAIGHTENING VANES

A straightening vane assembly is mandatory and shall be positioned directly upstream of the measuring element. The straightening vane assembly shall be an integral component of the measuring chamber.

CONNECTIONS

Flanges for the 1-1/2" and 2" size meter assemblies shall be of the 2-bolt oval flange configuration. The 3", 4", 6", 8" and 10" size meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

CERTIFICATIONS AND MARKINGS

All sizes of meter packages shall display the sizes, model, manufacturer name, and direction of flow. Such display shall be cast on the side of the meter maincase.

GUARANTEE AND MAINTENANCE PROGRAM

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange.

INTENT

Subject meter specifications are designed to establish minimum guidelines for selecting an extremely critical metering device. Areas of concern to be evaluated in the selection process include, but are not limited to, ease of installation, operational features and benefits, readability and future system maintenance expense. A design, which reflects longevity of proper operation in all elements and high degree of sustained accuracy within the entire range of the meter assembly, is to be considered mandatory. Enhanced accuracy levels and performance are desired and will not be compromised.

RECOMMENDATION

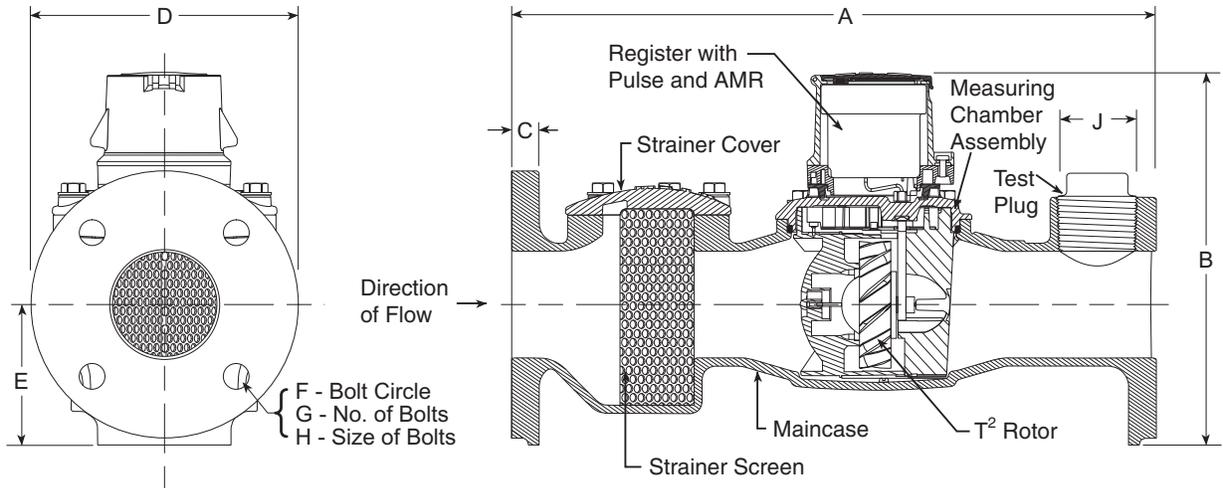
Sensus
OMNI T² Meter

© All products purchased and services performed are subject to Sensus' terms of sale, available at either; <http://na.sensus.com/TC/TermsConditions.pdf> or 1-800-METER-IT. Sensus reserves the right to modify these terms and conditions in its own discretion without notice to the customer.

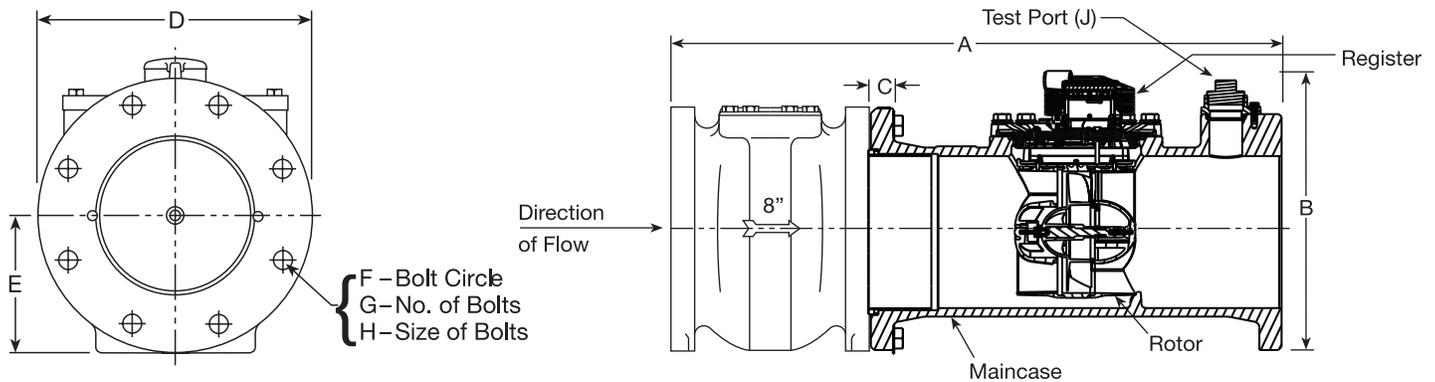
This document is for informational purposes only, and SENSUS MAKES NO EXPRESS WARRANTIES IN THIS DOCUMENT. FURTHERMORE, THERE ARE NO IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. ANY USE OF THE PRODUCTS THAT IS NOT SPECIFICALLY PERMITTED HEREIN IS PROHIBITED.

OMNI T²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

OMNI T²: 1 1/2" - 6"



OMNI T²: 8" - 10"

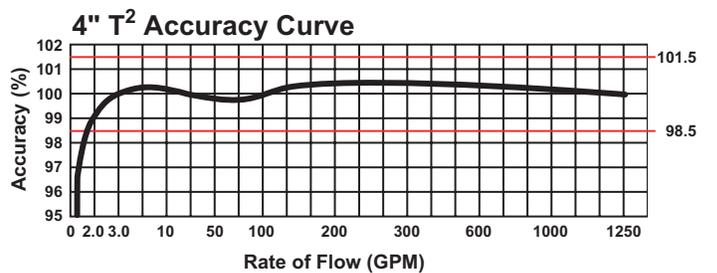
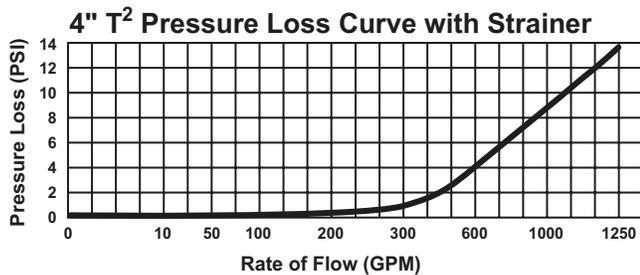
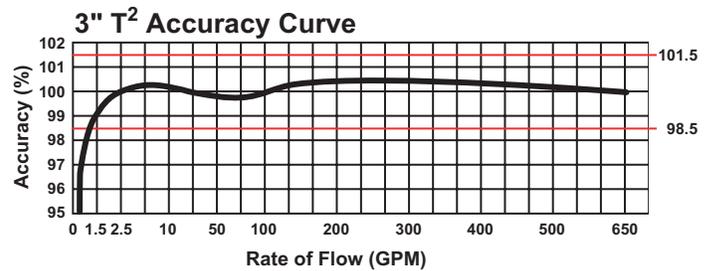
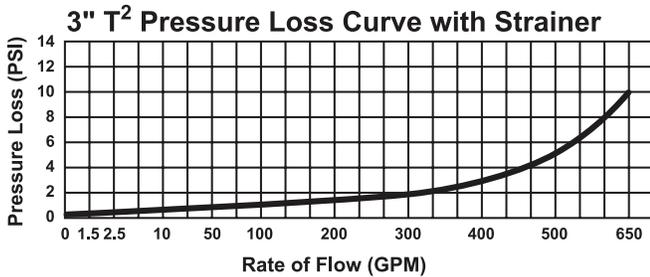
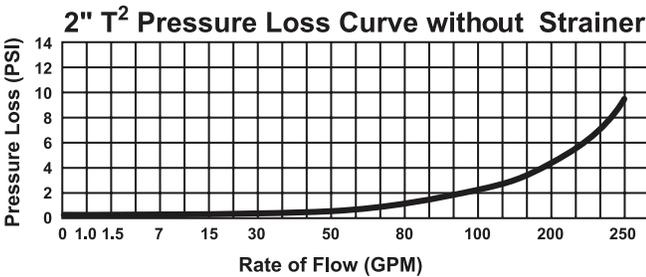
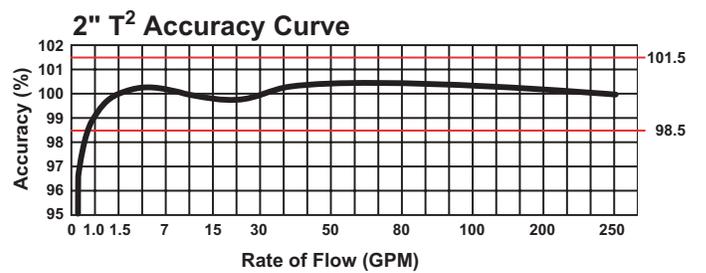
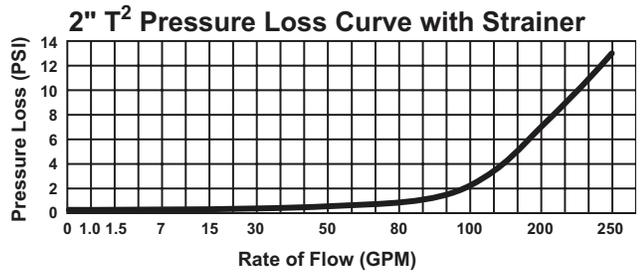
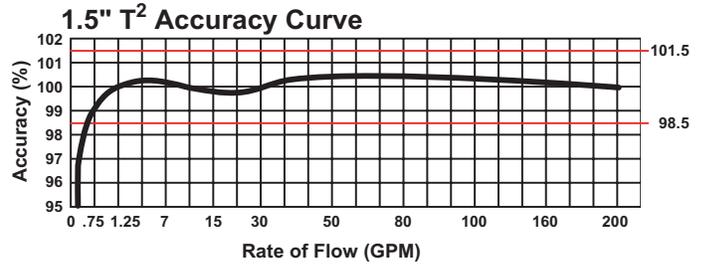
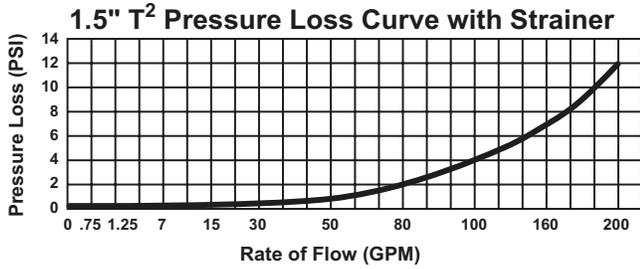


DIMENSIONS AND NET WEIGHTS

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight
1-1/2" DN 40mm	1.25 gpm .28 m ³ /hr	200 gpm 45 m ³ /hr	Flanged	13" 330mm	7-7/8" 200mm	15/16" 24mm	5-1/8" 130mm	2-5/16" 59mm	4" 102mm	2	5/8" 16mm	1" 25mm	18.8 lbs. 8.53 kg.	22.5 lbs. 10.20 kg.
2" DN 50mm	1.5 gpm .34 m ³ /hr	250 gpm 57 m ³ /hr	Flanged	17" 432mm	7-7/8" 200mm	1" 25mm	5-3/4" 146mm	2-5/16" 59mm	4-1/2" 114mm	2	3/4" 19mm	1-1/2" 40mm	27.4 lbs. 12.42 kg.	34.5 lbs. 15.65 kg.
3" DN 80mm	2.5 gpm .57 m ³ /hr	650 gpm 148 m ³ /hr	Flanged	19" 432mm	8-3/4" 222mm	3/4" 19mm	7-7/8" 200mm	4-1/8" 105mm	6" 153mm	4	5/8" 16mm	2" 50mm	48.5 lbs. 22.00 kg.	57.4 lbs. 26.04 kg.
4" DN 100mm	3.0 gpm .68 m ³ /hr	1250 gpm 284 m ³ /hr	Flanged	23" 584mm	11-3/16" 284mm	15/16" 24mm	9-1/8" 232mm	4-3/4" 121mm	7-1/2" 191mm	8	5/8" 16mm	2" 50mm	67.9 lbs. 30.80 kg.	75.8 lbs. 34.38 kg.
6" DN 150mm	4 gpm .91 m ³ /hr	2500 gpm 568 m ³ /hr	Flanged	27" 685mm	13-1/4" 336mm	15/16" 24mm	11" 279mm	5-3/4" 146mm	9-1/2" 242mm	8	3/4" 19mm	2" 50mm	140 lbs. 52.3 kg.	165 lbs. 61.6 kg.
8" DN 200mm	5 gpm 1.1 m ³ /hr	3500 gpm 795 m ³ /hr	Flanged	30-1/8" 765 mm	15" 381 mm	11/16" 17 mm	13-1/2" 343 mm	6-3/4" 172 mm	11-3/4" 300 mm	8	3/4" 19 mm	2" NPT	471 lbs. 214 kg.	521 lbs. 236 kg.
10" DN 250mm	6 gpm 1.4 m ³ /hr	5500 gpm 1249 m ³ /hr	Flanged	41-1/8"	19" 485mm	11/16" 17mm	16" 406mm	8-1/2" 216mm	14-1/4" 362mm	12	7/8" 22mm	2" NPT	685 lbs. 311 kg.	745 lbs. 338 kg.

OMNI T²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

Headloss Curves





Columbia County, Georgia
Project Construction Cost

Date:

Complete Name of Development (Section/Phase):

Name of Developer:

Name of Engineering Firm/Surveyor:

Name of Contractor:

Total Number of Lots:_____

Total Roadway Cost:_____ Total Length:_____

Total Sanitary Sewer Cost:_____ Total Length:_____

Total Storm Sewer Cost:_____ Total Length:_____

Total Water Cost:_____ Total Length:_____

Total Sidewalk Cost:_____ Total Length:_____



Columbia County Water Utility
Engineering/Inspections Department
P.O. Box 960 – Grovetown, GA 30813
Phone: (706) 651-0433 Fax: (706) 651-0648

Sewer Flow Test Request Form

Date: _____

Project: _____

Requested By: _____

Phone Number: _____

Email Address: _____

Billing Address: _____

Size of Sanitary Sewer Line: _____

Location of Test: _____

Office Use Only

Type of Sanitary Sewer Line: _____

Test Performed By: _____

Start Date: _____

Finish Date: _____

Remarks: _____

This form is also available on the website. The form can be completed and forwarded directly to the Engineering / Inspection Department for processing. www.columbiacountyga.gov

Please email request to Sewerflowtest@columbiacountyga.gov



Columbia County Water Utility
Engineering/Inspections Department
P.O. Box 960 - Grovetown, GA 30813
Phone: (706) 651-0433 Fax: (706) 651-0648

Water Flow Test Request Form

Date: _____

Project: _____

Requested By: _____

Phone Number: _____

Email Address: _____

Billing Address: _____

Size of Water Line: _____

Location of Test: _____

Hydrant-1 Number (Static Hydrant) : _____

Hydrant-2 Number (Flow Hydrant) : _____

Office Use Only

Test Performed By: _____

Start Date: _____

Finish Date: _____

Pressure System Zone: _____

Remarks: _____

This form is also available on the website. The form can be completed and forwarded directly to the Engineering / Inspection Department for processing. www.columbiacountyga.gov

Please email request to Waterflowtest@columbiacountyga.gov

COLUMBIA COUNTY WATER UTILITY
GDOT UTILITY ENCROACHMENT PERMIT CHECK LIST

- ___ Beginning mile point (distance from nearest intersection)
- ___ Ending mile point (distance from nearest intersection)
- ___ Traffic Control Type
- ___ Work Description
- ___ Estimated number of work days
- ___ Impact bridge or wall attachments (Yes or No)
- ___ Minimum distance from edge of pavement
- ___ Maximum distance from edge of pavement
- ___ Pipe size
- ___ Pipe material
- ___ Casing diameter
- ___ Casing material
- ___ Valve quality
- ___ Manhole quantity
- ___ Minimum depth of utility
- ___ Maximum depth of utility
- ___ Involves pavement cutting (* Yes or No)
- ___ Involves blasting (Yes or No)
- ___ Location map (pdf format)
- ___ Utility plan sheet (pdf format)
- ___ Utility profile sheet (pdf format) [required for road bores]

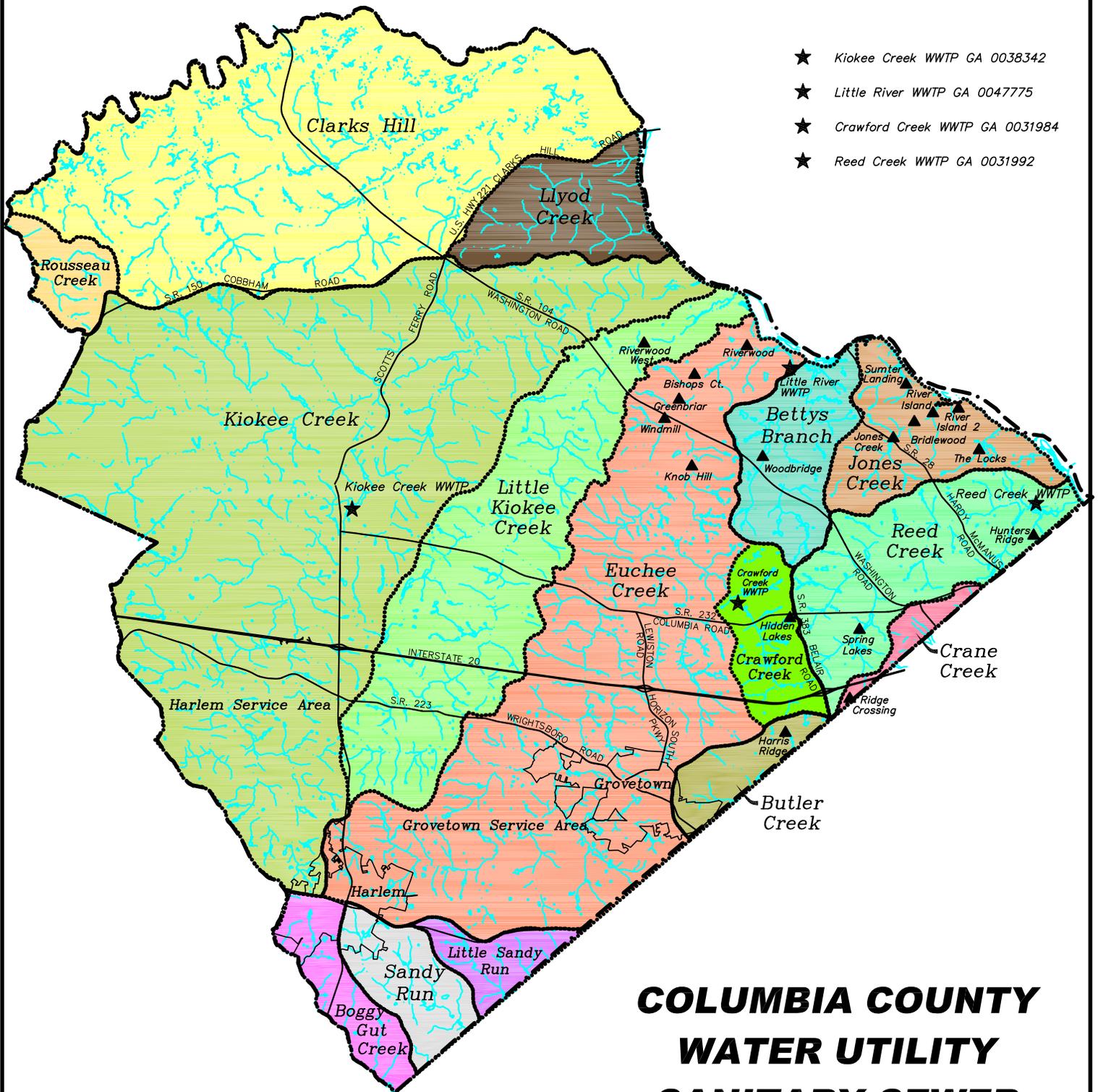
****Requires a pavement repair detail***



Legend

- Primary Roads
- Basin Distinction Line
- ★ Waste Water Treatment Plant
- ▲ Lift Station

- ★ Kiokee Creek WWTP GA 0038342
- ★ Little River WWTP GA 0047775
- ★ Crawford Creek WWTP GA 0031984
- ★ Reed Creek WWTP GA 0031992



COLUMBIA COUNTY WATER UTILITY SANITARY SEWER BASIN MAP

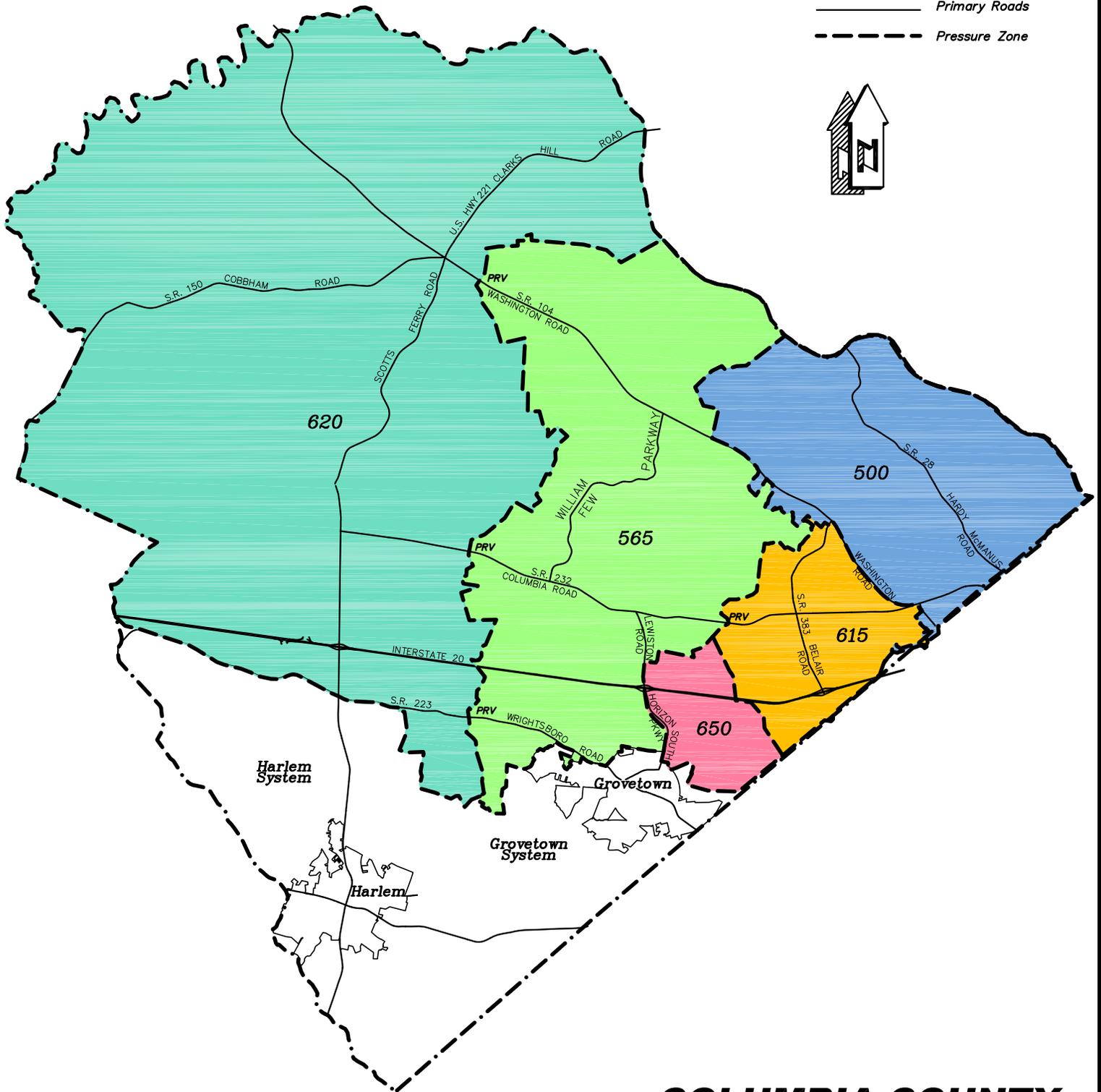
1"=16,000'

Betty's Branch and Jones Creek Basins are served by the Little River WWTP.

Service in the Crawford Creek Basin Area may be served by Little River WWTP (Euchee Creek Basin).

Legend

- Primary Roads
- - - - - Pressure Zone



**COLUMBIA COUNTY
WATER UTILITY
PRESSURE SYSTEM
ZONE MAP**

1"=16,000'