

WATER MAINS

DESCRIPTION

- 1601.1 Water mains and appurtenances of the specified size, class and type shall be placed to the line and grade given by the Engineer and in accordance with the design shown on the Plans.

MATERIALS

- 1602.1 All pipes, fittings, gate valves and fire hydrants shall conform to the American Water Works Association (AWWA) Standards specified herein.
- 1602.2 **Pipelines:** Water mains shall be cast iron, polyvinyl chloride pipe or ductile iron pipe as designated on the plans or as specified in the Special Provisions. Fire hydrant laterals and fire services shall be cast iron, ductile iron, or polyvinyl chloride pipe. Polyvinyl chloride pipe shall be used for the below ground portion only.
- 1602.2A Cast iron pipe shall conform to AWWA C106, Class 150, with one-sixteenth inch (1/16") minimum cement-mortar lining (AWWA C104-80) and push-on joint ends.
- 1602.2B Ductile iron pipe shall conform to AWWA C151, Class 50, with one-sixteenth inch (1/16") minimum cement-mortar lining (AWWA C104) and push-on joint ends.
- 1602.2C Polyvinyl chloride pressure pipe shall conform to AWWA C900, Class 235, with cast iron equivalent outside diameter and "Ring-Tite" ends or approved equal.
- 1602.3 **Gate Valves:** Gate valves shall be resilient-seated and shall conform to AWWA C509, latest revision, with non rising stems and wrench nuts. Valve ends shall be "Ring-Tite" or approved equal, push-on joint for cast iron, ductile iron or polyvinyl chloride pipe, except as permitted in Subsection 1602.5. Valves shall have protective interior coatings in accordance with AWWA C550.
- 1602.4 **Fittings:** Pipeline fittings shall conform to either AWWA C110, minimum working pressure of 250 psi, or AWWA C153 with "Ring-Tite" ends or approved equal and push-on joint ends for cast iron, ductile iron or polyvinyl chloride pipe. Fittings shall have a one-sixteenth inch (1/16") minimum cement-mortar lining conforming to AWWA C104.
- 1602.5 A minimum of three feet (3') clear between fitting on the water main and eighteen inches (18") clear between service connections on said main shall be maintained.
- 1602.5 **Flanged and Mechanical Joints:** Where fittings or fittings and valves are in close proximity, flanged or mechanical joints must be used. When fittings or valves are installed, joints shall be either flanged or mechanical. Flanged fittings shall conform to AWWA C110. Mechanical-joint fittings shall conform to either AWWA C110 or C153. Fittings shall have a one-sixteenth inch (1/16") minimum cement-mortar lining conforming to AWWA C104-80.

- 1602.6 **Fire Hydrants:** Fire hydrants shall conform to AWWA C503, latest revision, and shall have an "East Bay" design profile with one two and one-half inch (2-1/2") and one four and one-half inch (4-1/2") outlet and shall be painted yellow enamel. Outlet nozzles shall have replaceable National Standard Hose Threads. Hydrant flanges shall have an eleven and one-half inch outside diameter (11-1/2" O.D), with six equally spaced bolt-holes of three-fourths inch (3/4") diameter drilled on a bolt circle of nine and three-eighth inch diameter (9-3/8"). Outlet nozzle caps shall be securely chained to the hydrant barrel.
- 1602.7 **Water Service Lines:** Water service lines shall be 1", 1-1/2", 2", 3", 4", or larger as specified by the Engineer or as shown on the approved plans. All service lines shall have a corporation stop (1", 1-1/2", & 2") or a gate valve (3" and larger) installed at the connection to the water main. Materials shall be as specified on the Standard Drawing or as directed by the Public Works Inspector for that size service, or as directed below, and/or as directed by the Engineer.
- 1602.8 Poly water services shall consist of the following:
- a. Poly Pipe: 200 PSI PE 3408 CTS tubing, SDR-9 ASTM D2737, or equal.
 - b. Poly Insert Stiffener: Stainless Steel Tubular Insert Stiffeners are required on all connections:
A.Y. McDonald: - 6133T stainless steel (1", 1½", & 2") or equal; Ford: insert - 52 (1"), Insert - 54 (1½"), Insert - 55 (2") stainless steel or equal.
 - c. Curb Stop (Teflon ball angle meter valve):
A.Y. McDonald: 74602B-22 (1"), 74602B-22 (1½"), & 74602B-22 (2") or equal; Ford: BA43-444W-NL(1"), BFA43-666W-NL(1½"), and BFA43-777W-NL(2") or equal.
 - d. Corporation Stop (Teflon ball corporation stop, MIP x CTS pack joint):
A.Y. McDonald 74704B-22 (1"), 74704B-22 (1½"), and 74704B-22 (2"), or equal; Ford FB1100-4-NL(1"). FB1100-6-NL(1½"), and FB1100-7-NL(2") or equal.
 - e. Service Saddle:
Smith-Blair 3175 epoxy coated ductile iron with stainless steel double straps (1", 1½", and 2" x main O.D.) or equal.
 - f. Tracer wire:
10 gauge single strand solid copper wire with PVC nylon jacket UL#E14656 on all Poly services, PVC main lines, laterals, or as directed by the Public Works Inspector, or equal.
 - g. Water Meters (equipped with USG 3G Registers, gallon register):
1" 3G USG UC83, MJ09-1GD-AAA-2, 1½" flange 3G USG UC83, MJ11-1GD-AAA-2, 2" 3G USG UC83, MJ13-1GD-AAA-2, (larger sizes are available on request).
 - h. Meter Box:
Meter box is plastic; ductile iron cover with meter reader view door. Meter box and cover are grey in color. Carson Industries Meter Box MSBCF 1324-12XL for 1" meters, Carson Industries Meter Box MSBCF 1730-18XL for 1½" & 2" meters.

- 1602.9 Water Services 3” or larger shall be connected to the main water line by either a Tee or a Stainless Steel Tapping saddle and the service line shall be ductile iron or Class 235 C900 to the meter box.
- 1602.10 Water Services 3” or larger shall have a by-pass with meter as per 3” water service detail and as directed by the Public Works Inspector.
- 1602.11 When installing new water service line to existing services with meter, the meter and box shall remain and the new service connected to it. In cases where an existing service is served by a dual water service line, a new individual service line shall be installed to each existing water service.

CONSTRUCTION PROCEDURE

- 1603.1 **Excavation:** The Contractor shall perform all excavation necessary or required to construct all pipelines and structures covered by these plans and specifications.

Heavy-duty machinery for cutting and breaking pavement shall be used only when permitted by the Engineer.

Street surfaces along the edge of the trench shall be cut to a neat line with a cutting device and prior to the placement of finish pavement. All street surfacing, within the limits of the trench excavation shall be removed and disposed of as excess material before excavating the trench. None of this material will be allowed in the backfill.

- 1603.2 **Bracing and Shoring:** The Contractor shall do all bracing, shoring and sheathing necessary to perform and protect all excavations as required for safety, and to conform to the governing laws, or as directed by the Public Works Inspector.

- 1603.3 **Bedding:** The surface upon which the pipeline is to be constructed shall be firm and true to grade. The subgrade for the pipe shall be so prepared that the entire length of each pipe section shall have a firm and uniform bearing. Where the bottom of the trench when excavated to proper depth does not provide suitable foundation for the pipe, all such unsuitable material under the pipe shall be removed and the space back-filled with suitable material properly compacted to provide adequate support for the pipe.

- 1603.4 **Pipe Laying:** Pipe and fittings shall be carefully inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection. The Engineer shall approve any corrective work and no additional compensation will be allowed for such corrective work. Suitable excavations shall be made to receive the bell or collar to prevent any possibility of bells or couplings resting on original trench bottom.

- 1603.4A Interior of the pipe shall be kept free from dirt and other foreign materials as the pipe laying progresses. The open ends of all pipelines shall be tightly plugged whenever work is stopped for any reason.

- 1603.4B **Deflection:** When it is necessary to deflect the pipe from a straight vertical or horizontal alignment, the deflection shall not exceed that shown in Tables 16-1 through 16-2, the manufacturer's recommendation or that shown on the Plans, whichever is smallest.
- 1603.4C **Detector Wire:** Non-metallic water mains and services shall have a No. 10 coated solid copper detector wire placed over the pipeline prior to backfilling. Each end of the detector wire shall be brought up inside the valve box with two feet (2') of wire free or fastened to a vertical metal rod inside the box, or connected to the corporation stop of the service line from the curb stop at the main line. Full compensation for furnishing all labor, materials, tools, equipment, incidentals, for placing this number 10 wire as specified herein, or as designated on the Plans, or as directed by the Engineer, shall be considered as included in the contract price paid for linear foot of water main and no further compensation shall be made therefor.
- 1603.4D **Trench Backfilling:** After placement of the pipe, trench backfilling shall commence. The pipe shall be shaded by hand shovel method with suitable material to one foot (1') above the top of the pipe. If clods exist in the spoil pile, which may damage the pipe, they shall be removed. The backfill material shall be placed and compacted by hand around the pipe in six (6") inch lifts and compacted as detailed in "***Backfill Requirements for AC Streets***" Detail. Backfill placed above this point shall be free of clods or objects larger than four inches (4") in diameter, which shall be removed prior to continuation of backfilling and compaction of said trench.
- 1603.4E **Compaction Testing:** All pipeline trenches shall be compacted as per "***Backfill Requirements for AC streets***" Detail.
- The first compaction test will be paid for by the Owner when the Contractor notifies the Public Works inspector 48 hours prior to testing, otherwise the Contractor will be responsible for payment of that test. If the first test fails, each successive test thereafter will be the responsibility of the Contractor.
- 1603.5 Field jointing of cast iron, ductile iron, and polyvinyl chloride pipe shall be performed in accordance with the pipe manufacturer's recommendations. Lubricant other than that furnished with the pipe shall not be used unless approved by the Engineer.
- 1603.6 **Lead Joints:** Where existing bell and spigot joints necessitating new seals are encountered, lead shall not be used to seal the joints. The Engineer shall approve the method of sealing prior to being used.
- 1603.7 **Thrust and Anchor Blocks:** Concrete thrust blocks shall be installed at all tees, crosses, hydrant burys, pipe ends and horizontal bends. Anchor blocks shall be constructed beneath valves and upper bends. Thrust and anchor blocks shall be installed in accordance with the city Standard Drawings.
- 1603.8 **Gate Valves:** Gate valve stems shall be installed vertical.

- 1603.9 **Order of Work:** The contractor shall submit his schedule of work for approval by the Engineer prior to commencing work.
- 1603.9A All pressure and disinfection tests shall be completed prior to connection to existing mains. Temporary plugs shall be installed on the pipe ends where necessary to allow for pressure tests and disinfection prior to connection to the water system.
- 1603.9B **Pressure and Leakage Test:** After the water pipe has been laid and passed compaction testing, it shall be subjected to a combined pressure and leakage test as specified by the Engineer. Tests shall be made after completion of backfill and compaction and at least 36 hours after placing concrete anchor and thrust blocks.

Preparatory to testing, the section of pipeline to be tested shall be filled with water and placed under a slight pressure for at least 48 hours. The pipeline shall then be brought up to the test pressure specified and maintained on the section under the test for a period of not less than 2 hours. Unless otherwise specified, the test pressure shall be 125 psi and shall not vary over 5 psi± for the duration of the test. The total duration for the combined pressure and leakage tests for each section shall be 2 hours unless otherwise directed by the engineer. The Contractor shall furnish testing apparatus.

Before applying the hydrostatic pressure, all entrapped air shall be thoroughly bled off. For all types of water mains there shall be no visible leakage at any joint or section of pipe and the allowable leakage for the total lengths of all water mains under test shall not exceed that amount specified in Table 16-3 “**Allowable Leakage for PVC or Cast or Ductile Iron Pipes**”. If the test leakage in any section is greater than allowed, the leakage shall be located and all defective elements shall be repaired or removed and replaced, and the section retested until the leakage is within the allowable limits. The Contractor shall replace all materials found to be defective. Accurate means shall be provided for measuring the quantity of water required to maintain full pressure on the line during the test period.

Water for testing may be taken from the nearest blow-off, fire hydrant, or other approved source. Under no condition shall the water be introduced to the new pipe system by a direct tie-in to the existing system. The Contractor can connect the new line to the existing by means of a by-pass line only, with water being introduced into the system through the by-pass line. Said by-pass line shall have an approved Double Check Backflow Prevention Device installed and said by-pass line shall be disconnected prior to pressure testing and disinfecting.

TABLE 16-3 Allowable Leakage for PVC, Cast, or Ductile Iron Pipes.

Allowable Leakage per 50 joints of PVC pipe or 1000 feet of pipe - gph

Hr	psi	Pipe Material	Pipe size (inches)					
			6	8	10	12	14	16
1*	125	Polyvinyl Chloride	0.45	0.60	0.76	0.91	1.06	1.21

*(2 hour minimum test)

Allowable Leakage per 1000 feet of Cast or Ductile iron pipe - gph

1*	125	Cast or Ductile Iron	0.50	0.67	0.84	1.01	1.18	1.34
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*(2 hour minimum test)

If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

Based on AWWA Standards C600 & C605 for “Cast or Ductile Iron Pipe” & “Polyvinyl Chloride Pipe” respectively, most recent update.

All tests shall be made in the presence of the Public Works Inspector.

1603.9C **Disinfection:** Before being placed in service and before certification of completion by the Engineer, all new water pipes shall be cleaned and disinfected in accordance with ANSI/AWWA C651. The Contractor shall furnish materials for disinfection of the lines. When installation has been completed the lines shall retain the disinfected water for a period of 48 hours then flushed.

1603.9D **Water Purity Testing:** There shall be a minimum of two samples per project location.

1603.9E One sample shall be taken for every ten (10) service connections or every five-hundred linear feet (500 LF) of water main installed (i.e. the distance between samples shall not exceed five-hundred feet (500’)); whichever calculates the greater number of samples. Cul-de-sacs that are isolated from the rest of the system will have separate samples taken. Cul-de-sacs that are not isolated will have the ten (10) service connection or five-hundred foot (500’) rule application. All blow-offs, including temporary blow-offs during construction, shall be tested. Fire hydrants shall not be tested.

1603.9F If a sample or samples fail, the City will take a second sample at each of the failed locations before any corrective action is performed on the water or water facilities. If the second sample fails, all samples will be retaken after the Contractor has taken corrective action.

1603.9G Purity Testing shall be in accordance with these specifications and the “Public Works Department’s Water Purity Testing Standard Operational Procedures.”

- 1603.9H If the Contractor is directed by the Public Works Inspector, Engineer, or the Plans, to provide a means to take purity samples at points where there are no blow-offs, water services, or fire hydrants, then the Contractor shall install one inch (1") water service saddles with corporation stop, 90° elbow, a riser at the time of testing to be brought up to a minimum of one foot (1') above grade with a one hundred-eighty degree (180°) bend at the top to allow for downward flow of water, and cap where the Water Division personnel can take a sample from. After the purity samples have passed, the contractor shall remove the riser and elbows and insert a cap to the corporation stop as directed by the Public Works Inspector. Full compensation for furnishing all labor, materials, tools, equipment, incidentals, for installing these one inch (1") water purity stations as specified herein, or as designated on the Plans, or as directed by the Public Works Inspector or Engineer, shall be considered as included in the contract price paid for linear foot of water main and no further compensation shall be made therefor.
- 1603.10 **Closing and Opening of Valves:** Water valves on existing mains shall be closed or opened only by Water Division Employees.
- 1603.11 **Abandoned Pipes:** Remove all gate valves and boxes, and plug all ends of the pipelines to be abandoned in place with Class "A" concrete.
- 1603.11A **Water Main Shutdown:** Shutdown procedure shall be in accordance with these specifications and the "Public Works Department's Water Main Shutdown Standard Operational Procedures."
- 1603.11B No residence or business shall be without water due to this project for over four (4) hours at a time. For every hour over four (4) hours shutdown, the Contractor shall be penalized \$200.00 per hour. Hours used in assessing the penalty shall be rounded to the nearest hour.
- 1603.11C In addition to the penalty in subsection 1603.15B, the Contractor shall pay the city for any overtime by its employees which result from the water main shutdown work which is performed between the hours of 5:00 PM and 7:00 AM due to exceeding the four (4) hour shutdown limit or delays in starting the work.
- 1603.11D Prior to notification and tagging of customers affected by the shutdown, each connection to be joined shall be potholed by the Contractor and the existing pipe or fitting to be connected to shall be accurately measured. Measurements shall be witnessed by the Public Works Inspector and Water Utility Superintendent, both of which shall be given 24 hours notice of when witnessing is required.
- 1603.11E Only one tie-in connection to the existing water system shall be in progress at a time. No connection shall be started until all materials required for that connection are at the site and have been verified by the Public Works Inspector and Water Utility Superintendent.

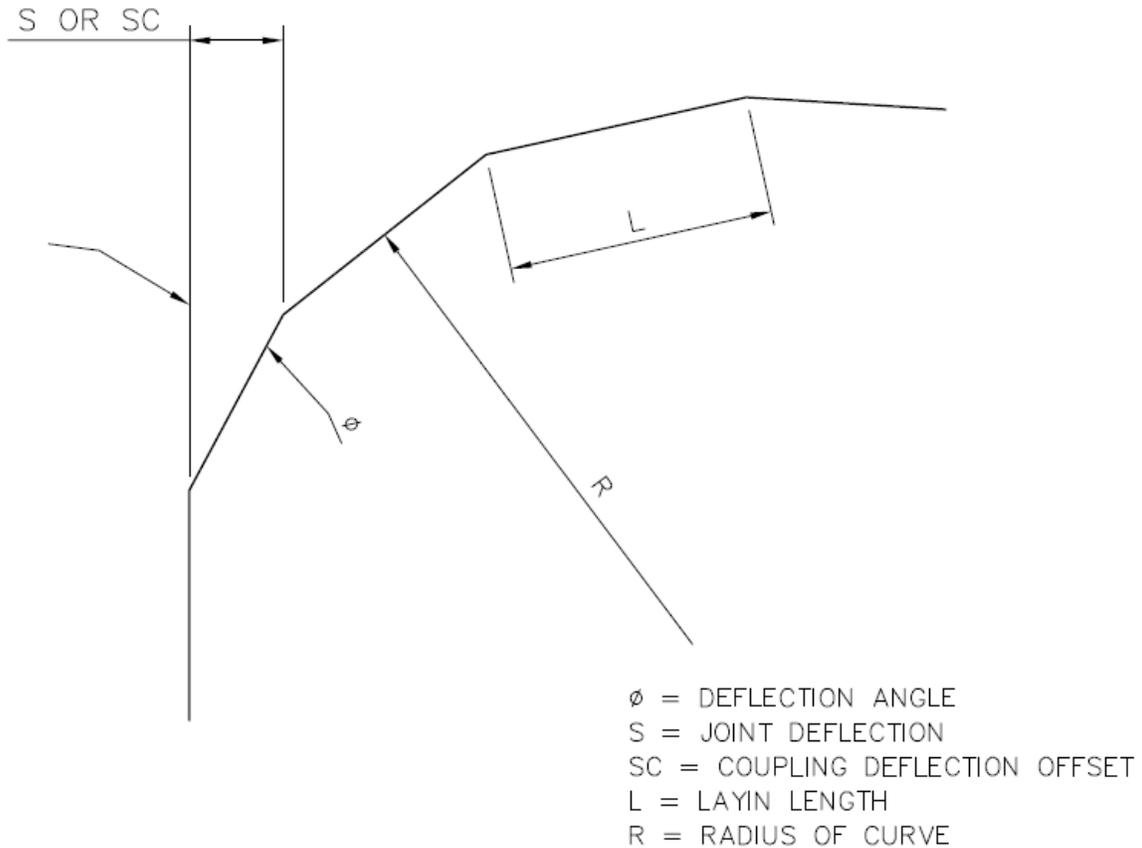
- 1603.12 Full compensations for furnishing all labor, materials, tools, equipment, incidentals, and for doing all the work, in addition to the pressure testing, purity testing, and installation of extra purity stations, as specified herein, as designated on the Plans, and as directed by the Public Works Inspector or Engineer shall be considered as included in the contract price paid per linear foot of water main, quantity of valves, fittings, or fire hydrants, and no additional compensation will be made therefor.
- 1603.13 **Fire Hydrant Reflective Markers:** Blue reflectorized markers for Fire Hydrants shall be set at one foot (1') from the centerline opposite the Fire Hydrant.
- 1603.14 **Red painted curb at fire hydrant locations:** A waterborne base traffic Red paint, quick dry, in the mix formulation as indicated within the Caltrans Standards; shall be applied to the top and face of curb to a point ten foot (10') each side of the fire hydrant on a straight run or from the end of curve of the corner radius opposite the fire hydrant to a point ten foot (10') beyond the fire hydrant, as directed by the Public Works Inspector. At locations where existing fire hydrants are removed, the existing red paint shall be removed by whatever means necessary to achieve a clean smooth surface free of paint and gouges.
- 1604.1 **As-Built Plans:**
- 1604.2 Any deviations from the original plans involving location, alignment, or grade of any part of the water improvements shall be noted and shown on the original set of improvement drawings prior to their submittal to the City and marked "***As-Built.***"
- 1604.3 The distance of each water service at the property line, from the centerline monument shall be measured and recorded on the as-built drawings. All distances shall be determined by level chaining before any backfill is begun.

MEASUREMENT AND PAYMENT

- 1605.1 **Measurement:** The work performed under "***Water Mains***", and paid for by contract items will be measured by the linear foot, or by the number of items or by other methods specified on the Plans or in the Special Provisions.
- 1605.2 **Payment:** Items of work, measured as specified above, will be paid for at the unit price per linear foot or number of items installed, or as otherwise provided by the Plans or Special Provisions.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installation of water mains or fittings, or other items being installed as specified in these specifications, the Special Provisions, and as directed by the Engineer.

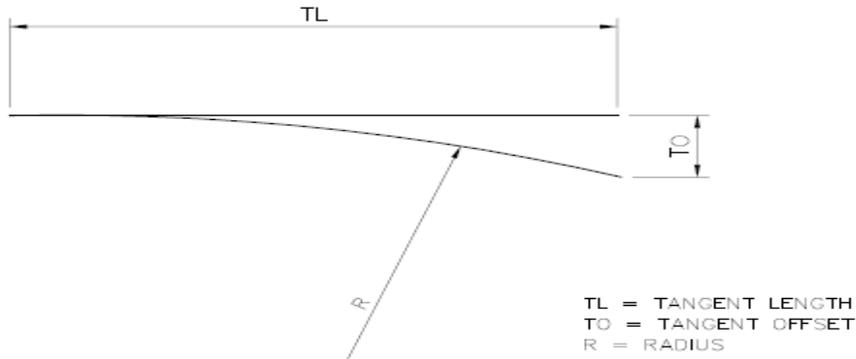
TABLE 16-1 Maximum Deflection for full length Cast Iron or Ductile Iron Pipes



RIGID PIPELINE CURVE GEOMETRY

Joint Type	Normal Pipe Size (Inches)	Deflection Angle - θ (Degrees)	Maximum Offset - S (Inches)		Minimum Radius of Curvature - R (feet)	
			L=18 ft.	20 ft.	L=18 ft.	20 ft.
Push-On	4 to 12	5	19	21	205	230
	14 up	3	11	12	340	380
Mechanical	14 & 16	3-3.5	13.5	15	285	320
	8 to 12	5-21	20	22	195	220
	6	7-07	27	30	145	160

TABLE 16-2 Maximum Deflection for Polyvinyl Chloride Pipes



FLEXIBLE PIPELINE CURVE GEOMETRY

Nominal Pipe Size (Inches)	Maximum Tangent Offset - TO (Feet)											Minimum Radius of Curvature - R (Feet)
	Tangent Length - TL (Feet)											
	20	40	60	80	100	120	140	160	180	200	220	
6	1.0	4.0	9.2	16.7	26.8	40.0	57.2	80.	112.8	200.0	-	200
8	0.8	3.2	7.3	13.1	20.8	30.7	42.9	57.9	76.5	100.0	131.3	250
10	0.7	2.7	6.1	10.9	17.2	25.0	34.7	46.2	60.0	76.4	96.0	300
12	1.5	2.1	4.8	8.6	13.6	19.7	27.1	35.8	46.0	57.3	71.3	375

OVERSIZE (3" OR LARGER) WATER METER INFORMATION

SUPPLIER:

HD Supply
25108 Rye Canyon Loop
Valencia, CA 91355
Chris Lambros - Product Specialist
Phone Number: 909-376-3141

Local Distributor:

HD Supply
3050 South Cedar Street
Fresno, CA 93725
Don Fritz - Product Specialist
Phone Number: 559-237-7488

3G Part Numbers for Specs:

Residential - Utility Code #83

5/8" x 3/4" 3G USG Bottom Load EBII Body Meter #83	BL05-1MD-NAA-2, #83
3/4" x 7-1/2" 3G USG Bottom Load EBII Body Meter #83	BL06-1MD-NAA-2, #83
3/4" x 9" 3G USG Bottom Load EBII Body Meter #83	BL07-1MD-NAA-2, #83
1" 3G USG Bottom Load Standard Body Meter #83	BL09-1MD-AAA-2, #83
1" 3G USG Top Load Standard Body Meter #83	MJ09-1MD-AAA-2, #83
1-1/2" 3G USG Flanged Standard Body Meter #83	MJ11-1MD-AAA-2, #83
2" 3G USG Flanged Standard Body Meter #83	MJ13-1MD-AAA-2, #83

Turbine w/Separate Strainer

1-1/2" WZ Bronze Body Turbine Meter - USG	TM11-1BM-AAG-2
3G-WR Clip-On Wireless Transceiver	199-004-55
1-1/2" Bronze Body Strainer	907-150-TSA
2" WZ Bronze Body Turbine Meter - USG	TM13-1BM-AAG-2
3G-WR Clip-On Wireless Transceiver	199-004-55
2" Body Strainer	907-200-TSA
3" MMT Bronze Body Turbine Meter - USG	TM14-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	199-004-55
3" Bronze Body Strainer	907-300-TSA
4" MMT Bronze Body Turbine Meter - USG	TM15-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	199-004-55
4" Bronze Body Strainer	907-400-TSA
6" MMT Bronze Body Turbine Meter - USG	TM16-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	199-004-55
6" Bronze Body Strainer	907-600-TSA
8" MMT Bronze Body Turbine Meter - USG	TM16-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	199-004-55
8" Cast Iron Body Strainer	907-800-TS
10" WT Cast Iron Body Turbine Meter - USG	WT18-1BM-JAA-2
3G-WR Clip-On Wireless Transceiver	199-004-55
10" Cast Iron Body Strainer	907-900-TS
12" WT Cast Iron Body Turbine Meter - USG	WT19-1BM-JAA-2

3G-WR Clip-On Wireless Transceiver	199-004-55
10" Cast Iron Body Strainer	907-910-TS

Turbine W/Integral Strainer

2" MMT-S Bronze Body Turbine Meter - USG	TS13-1BM-AKG-2
3G-WR Clip-On Wireless Transceiver	199-004-55
3" MMT-S Bronze Body Turbine Meter - USG	TS14-1BM-AKA-2
3G-WR Clip-On Wireless Transceiver	199-004-55
4" MMT-S Bronze Body Turbine Meter - USG	TS15-1BM-AKA-2
3G-WR Clip-On Wireless Transceiver	199-004-55

Compound W/Separate Strainer

2" Dual Body Compound Meter Bronze Body - USG	DC13-1BM-AAG-2
3G-WR Clip-On Wireless Transceiver	(2EACH) 199-004-55
2" Bronze Body Strainer	907-200-TSA
3" Dual Body Compound Meter Bronze Body - USG	DC14-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	(2 each) 199-004-55
3" Bronze Strainer	907-300-TSA
4" Dual Body Compound Meter Bronze Body - USG	DC15-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	(2 each) 199-004-55
4" Bronze Body Strainer	907-400-TSA
6" Dual Body Compound Meter Bronze Body - USG	DC16-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	(2 each) 199-004-55
6" Bronze Body Strainer	907-600-TSA

Fire Service Meter W/Strainer

4" Fire Service Compound Meter - USG	FC15-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	(2 each) 199-004-55
6" Fire Service Compound Meter - USG	FC16-1BM-AAA-2
3G-WR Clip-On Wireless Transceiver	(2 each) 199-004-55
8" Fire Service Compound Meter - USG	FC17-1BM-AAA-2
3G-WR Clip-On Wireless Compound Meter - USG	(2 each) 199-004-55

Types of meter application/uses

Turbine Meter is for steady draw water flow. Compound Meter is for intermittent small draw water flows

Internal or exterior strainer, either one doesn't make any difference, but external appears to be better suited to the water in this area.

3" or larger water service lines shall be connected to the main by either a Tee or a Stainless Steel Tapping sleeve (in no case shall the service be same size or larger than the main line), followed by a gate valve, and either ductile iron, C900 pipe to the meter box.

SPECIFICATIONS FOR DIALOG 3G METERS

Description:	Dialog 3G true Wireless RF Water Meter		
Type:	Dialog 3G RF Transceiver inside the register - meter manufactures by Master Meter, Inc.		
Optional:	Dialog 3G Universal units - for external connection to Master Meter's water meters with Dialog registers and competition's meters with AMR compatible registers.		
Universal Unit Input:	Dry input Maximum frequency, 0.2 Hz, min close time>1 sec. Competitive AMR Compatible registers - Invensys AMR Encoders - Badger AMR Registers Single & Dual Pulse Registers Maximum distance from unit to meter - 40 feet		
Universal Unit Size:	4.9 inches x 6.9 inches x 3 inches	Weight:	13.4 ounces
Power Supply - Battery:	2.7 - 3.6 volts 40 mA at transmission burst Power - down mode - up to 2 mA	Operational Life:	10 years
RF Input:	Data Rate: 40Kbps	RF Output for Pit Settings:	14dBm (25mWatt) Data Rates: 120Kbps
Frequencies:	916MHz	Modulation:	FSK
Interface:	Dialog 3G inside the meter one single meter input Dialog 3G Universal: 1-4 separate meter inputs		
Wakeup:	Periodic - Internal timer	Operating Temp:	4° F to +140° F
Configuration Storage:	Non-volatile Memory	RF Regulation Standard:	FCC, Part 15 NTAXMETER2
Environment:	Dialog 3G IP-68, Dialog 3G™ Universal IP-68		
Internal Reading Parameters:	ID No 12-character numeric Read 9 digits, numeric, compatible with a water meter Mechanical counter. Factor Multiplication input count unit factor.		