

PART IV

MATERIALS

4.1 BACKGROUND:

Configuration management for the system wide standardization of repair parts, appurtenances, and construction materials are necessary to maintain reasonable spare parts inventories for emergency repairs and control the related cost to the benefit of the customer. For these reasons, the Kent County Water Authority has selected material standards that provide the greatest service life, reliability and are consistent with overall infrastructure compatibility. All materials used within the Kent County Water Authority shall be made in United States of America or specifically approved otherwise and conform to the standard requirements contained in this section.

4.2 SERVICES:

4.2.1 Service pipe sizes $\frac{3}{4}$ to 2 inches shall be either copper or H.D.P.E. pipe. Service pipe between the main and curb stop shall be copper. HDPE pipe color must be blue with a virgin clear natural center. Continuous identification markings over the entire length of the pipe with sealed ends and coiled in rolls from 100 ft. minimum. When H.D.P.E. service pipe is chosen, a solid stainless-steel insert shall be installed at each connection and a 12-foot type “K” copper whip shall be installed at the point of entry into any building or structure, and on the inlet and outlet of a meter pit.

4.2.1.1 H.D.P.E. shall conform to ASTM D3350 & D2737 Type III, Grade P34, Class A, Category 5, color blue with virgin clear natural center. AWWA C901, 200 psi (CTS).

4.2.1.2 Copper pipe shall be Type “K” copper tubing designed for potable water service ANSI/ASTM B88.

4.2.2 Services 3 inch and above shall be ductile iron and conform to the requirements for main materials and installation.

4.3 METERS:

4.3.1 All meters shall be compatible with the system utilized by the Kent County Water Authority. The Neptune ProCoder R-900: V5 chip system is standardized in Kent County.

4.3.2 All meters are to read in cubic feet. Must be capable of being read using the Radio Frequency system in place at the Kent County Water Authority. The radio

component shall employ the V5 chip. The register shall contain a 10–digit local registration and 4-8 digits can be communicated for billing purposes.

- 4.3.3 Any meter located in a meter pit or chamber shall be equipped with registers designed specifically for moisture protection and “pit” style application.
- 4.3.4 All fire service meters shall be in accordance with the Kent County Water Authority and NFPA standards with UL/FM approved strainer designed for fire service if required.

4.4 *METER CHAMBER/PITS/ABOVE GRADE ENCLOSURES:*

- 4.4.1 Meter chambers or pits are restricted to meter sizes 2 inch and below.
- 4.4.2 Meter and backflow configuration service sizes 3 inch and greater shall be placed in either and above grade heated enclosure or within the building. Above grade enclosures may be either prefabricated or stick built construction with adequate room to house all components, perform repairs and maintenance.
- 4.4.3 Single-family residential meter pits or chambers shall be prefabricated of either fiberglass or PVC construction and fitted with an inner and outer cover. The inner cover shall be fitted with a gasket and clamping mechanism to prevent the intrusion of water. Pits shall be of sufficient size for installation and maintenance of meters.

4.5 *AIR RELEASE MANHOLE:*

Air Release Manholes shall be watertight pre-cast concrete constructed with watertight cast iron manhole frame and diamond check pattern cover. Cover shall have the word “WATER” cast upon it in 4-inch capital letters. The chamber, frame, cover, and structural components shall be designed to withstand H-20 wheel loading. The frame and watertight cover assembly must conform to the requirements of the Kent County Water Authority for size and dimension. Manhole shall be outfitted with corrosion resistant, non-slip steps. The first step shall be positioned no greater than 15 inches from the cover.

4.6 *THRUST RESTRAINT:*

- 4.6.1 Restraining devices shall be utilized on all mains. Thrust blocks shall be constructed from concrete 4000 PSI at 28 days, sized according to the size of pipeline, type of fitting, water pressure and the characteristics of the soil. The concrete shall be properly formed as to slope for the given application and bearing width. The concrete shall be in contact only with the fitting, not with the pipe itself, fasteners or the joint. Concrete curing time shall be a minimum of 7 days.
- 4.6.1 The use of precast blocks may be used on a case by case basis when warranted due to field conditions. Precast blocks must be sized appropriate for the pressure, fitting and

pipe size. A professional engineer shall perform sizing calculations prior to obtaining approval for use on the project.

- 4.6.2 Thrust restraint may be via restrained joint, ductile iron pipe meeting ANSI/AWWA C151/A21.51 and ANSI/AWWA C11/A21. Restrained joint pipe lengths (restrained length) shall be sufficient to restrain thrust imparted by 1-1/2 times the anticipated working pressure but not less than 150 psi with a 1.5 factor of safety.
- 4.6.3 Gland and restraint components made from Ductile Iron and shall have a bituminous outside coating in accordance with ANSI/AWWA C151/A21.51 and ANSI/AWWA C153/A21.53 respectively. Capable of being used with standardized mechanical joint bell conforming to AWWA C111 and C153. Multiple wedge style restraint mechanism with powder coated heat-treated ductile iron wedges. Proper actuation ensured by torque limiting twist off nuts. Minimum safety factor 2 to 1. Restrained joints shall be suitable for 150 psi working pressure and fabricated of heavy section ductile iron casting. Gaskets shall meet the material requirements of ANSI/AWWA C111 for mechanical joint gaskets. Bolts and nuts as required should be low carbon steel conforming to ASTM A307, Grade B.
- 4.6.4 The use of Field Lock Gaskets may be used on a case by case basis as conditions warrant. Field Lock Gaskets shall be from the same manufacturer as the pipe.

4.7 WATER PIPE:

- 4.7.1 All ductile-iron pipe and appurtenances shall be from a single manufacturer source. Foreign pipe fittings and gaskets are strictly forbidden. Ductile iron pipe shall conform to ANSI/AWWA C151/A21.51, ANSI/AWWA C150/A21.50 Class 52 double cement mortar lined. Gaskets shall conform to ANSI/AWWA C111/A21.1. All pipes shall have a bituminous outside coating in accordance with ANSI/AWWA C151/A21.51 and ANSI/AWWA C153/A21.53 respectively. All pipes shall be cement-mortar lined and seal coated in accordance with ANSI/AWWA C104/A21.14 except the lining thickness shall be twice that specified. Joints for pipe shall be push-on (Tyton style only) or mechanical joint conforming to ANSI/AWWA C111. All mechanical joint pipes shall be supplied with accessories. Restrained joints shall be suitable for 150 psi working pressure and fabricated of heavy section ductile iron casting. Gaskets shall meet the material requirements of ANSI/AWWA and made in the USA.

Type: Ductile Iron meeting ANSI/AWWA C151/A21.51
ANSI/AWWA C150/A21.50.

Class: Special thickness Class 52.

Lining: Double cement mortar meeting ANSI/AWWA
C151/A21.5.

End Joints: Push on – Tyton style only – meeting ANSI/AWWA C111/A21.51.

Mechanical Joint – meeting ANSI/AWWA C111/A21.11.

Coating: Exterior: ANSI/AWWA C104/A21.4.

Interior: All requirements of EPA for potable water.

Gasket: Rubber meeting ANSI/AWWA C111/A21.11.

Nitrile (in contaminated soil).

4.8 PIPE FITTINGS:

Ductile iron fittings shall conform to ANSI/AWWA C153/A21.53. Foreign fittings, gasket glands and accessories are strictly forbidden. All fittings shall have a bituminous outside coating in accordance with ANSI/AWWA C151/A21.51 and ANSI/AWWA C153/A21.53 respectively. All fittings shall be cement-mortar lined and seal coated in accordance with ANSI/AWWA C104/A21.14 except the lining thickness shall be twice that specified. Joints for fittings shall be mechanical joints conforming to ANSI/AWWA C111. All mechanical joint fittings shall be supplied with glands and accessories.

Type: 4 inch to 12 inch Ductile Iron compact meeting ANSI/AWWA C153/A21.53.

16 inch and larger Ductile Iron meeting ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10.

Pressure Class: Pipe fittings shall have a pressure rating of 350 for 24-inch and smaller and 250 psi for 30-inch and larger. Fittings shall at a minimum have the same pressure rating as the connecting pipe.

Gaskets: Rubber meeting ANSI/AWWA C111/A21.11.

Nitrile (in contaminated soil).

4.9 VALVES:

4.9.1 Valves shall be cast iron or ductile iron 250-psi working pressure. Operating stem shall be provided with a minimum of two (2) O-ring stem seals. Bonnet and gland bolts/washers shall be stainless steel. Wedges shall be fully encapsulated. The interior and exterior surfaces of all cast iron or ductile iron components shall be fusion bond

epoxy coated, 8 mils minimum thickness. Epoxy coating must be undamaged with no chips or abrasions. Field touch-up of interior coating is not allowed. Field touch-up of exterior surfaces shall be in accordance with manufactures recoating specifications only. Contractors shall use special handling and installation precautions with the use of epoxy coated valves as necessary to ensure that no coating system damage occurs. At a minimum fiber slings or belts shall be used for all handling. All epoxy-coated valves shall be palletized and properly shrink-wrapped upon delivery to assure coating system integrity is not compromised. All epoxy valves found mishandled at delivery or during installation shall be rejected and removed from the job site. Foreign valves and gaskets are strictly forbidden. All valves shall be manufactured to meet or exceed AWWA C509 and ISO 9000 along with the design and operating characteristics of the following devices:

4.9.1.1 Resilient Seat Gate 4 inch to 12 inch:

Type:	Buried Service non-rising stem. Above grade service or pits OS & Y with hand wheel or non-rising stem with hand wheel.
Working Pressure:	250 PSI.
Opening:	Left or right depending on system location.
Stem:	420 Stainless steel or equal with minimum 80,000 PSI yield strength and a yield strength of 32,000 PSI.
Fasteners:	Stainless steel, type 304 for all of the valves.
Coatings:	Internal & exterior to be coated with fuse bonded holiday free epoxy coating minimum 8 mils nominal thickness meeting or exceeding AWWA C550.
Wedges:	Fully rubber encapsulated cast iron, ductile iron or bronze gate meeting AWWA C509.
Operating Nut:	2-inch square operating nut with hexagon stainless steel bolt fastener.
Stem Seal:	Minimum two O-ring seals.
Connection:	Mechanical Joint.

4.9.1.2 Butterfly 16” and larger:

Type:	Rubber seated tight closing or exceeding AWWA
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	C504 underground service. Class 150 or 250 depending upon service application requirements.
Stem:	Grade 18-8 type 304 Stainless Steel.
Valve vane/disc:	Ductile iron or high strength cast iron with either mechanically fastened Buna rubber seal or type 316 stainless steel seal seat ring.
Seat:	Stainless steel or Buna N Rubber. Rubber seat can be either bonded or mechanically fastened and shall not interrupt flow.
Actuator:	Dual link construction within a sealed housing for underground use designed for submergence in water to 25 feet of head and meeting AWWA C504. Valve nut shall be minimum of two-inch square made of ductile iron and fastened to stem. Operator to be traveling nut type capable of withstanding an overload input torque of 450 foot-pounds without damage to the valve or operator.
Opening:	Left or right depending on system location.
Fasteners:	Grade 18-8 stainless steel, type 304 for all fasteners of the valve.
Coatings:	Interior & exterior to be coated with fuse bonded holiday free epoxy minimum thickness 8 mils nominal meeting or exceeding AWWA C-550.
Connection:	Mechanical Joint or Flanged.

4.9.1.3 Tapping Sleeves and Valves:

Valves shall be full body and full port tapping type meeting the requirements paragraph 4.9.1.1 above. Sleeves shall be full port ductile iron or grade 18-8 type 304 stainless steel. Ductile iron sleeves shall be of the same manufacturer as of the valve and bituminous coated. All sleeves shall be manufactured to meet or exceed the design and operating characteristics of one of the following devices:

Type:	Resilient seat gate valves designed specifically for tapping.
Seal:	Stainless steel sleeves shall use grid pattern virgin

rubber ASTM 2000, full 360-degree pipe coverage. Ductile iron sleeves shall use mechanical joint with rubber seals.

Maximum Working Pressure:	4 inch-12 inch 250 PSI, 16 inch-24 inch 200 PSI.
Fastener:	Grade 18-8 Type 304 stainless steel.

4.9.1.4 Swing-Check:

- 4.9.1.4.1 Swing check valves shall utilize iron-body bronze-mounted design. They may employ metal to metal or composition to metal seat construction.
- 4.9.1.4.2 Working pressure shall be a minimum of 175 psi for valves up to 12 inch and 150 psi from 16 inch to 24 inch.
- 4.9.1.4.3 Swing check valves shall be mounted in a horizontal position. Direct access to the valve shall be accomplished by using a pre-cast concrete manhole with heavy-duty cast iron manhole frame and solid cover. The concrete structure and cover shall be capable of withstanding an ASHTO H-20 load. The cover shall have a diamond check pattern with the word "WATER" (in upper case letters) cast upon it. The manhole shall be outfitted with corrosion resistant, non-slip, steps.

4.9.2 Valve Road Box:

- 4.9.2.1 All valves (except swing-check) shall be equipped with a cast iron "Buffalo" type, adjustable (sliding) valve road box. The upper portion shall be 26 inches long and the bottom section 48 inch (min). Covers shall be 5-1/4" in diameter solid ring seat with the word "WATER" (in caps) cast upon it.
- 4.9.2.2 The upper portion of the box shall be manufactured with a heavy flange having sufficient bearing area to prevent settlement. The lower section shall be configured to enclose the valve stuffing box with an inside diameter of at least 4-1/4 inch. The installed box shall be capable of vertical adjustment of a minimum of 6 inches while maintaining an overlap of a least 4 inches between sections.

4.10 **HYDRANTS:**

To maintain system wide standardization, hydrants shall be dry barrel type with 5¼ inch valve. Hydrants shall conform to the “Standard Specifications for Fire Hydrants for Ordinary Water Works Service,” AWWA C-502, and shall in addition meet the specific requirements of the Kent County Water Authority as listed. Foreign hydrants and gaskets are strictly forbidden. Hydrants shall be UL rated for 250-psi working pressure and service installation in a trench that will provide various minimum cover. Hydrants shall be according to manufacturer’s standard pattern unless noted otherwise and of standard size, and shall be equipped with 6 inch mechanical joint connection for 6” ductile iron pipe, one 4 ½ inch steamer nozzle and two 2 ½ inch hose nozzles, brass or brass sleeved drains, National Standard Thread, hydrant inlet connections. Hydrants shall be of the full compression design, opening against and closing with the water pressure. The hydrants shall be designed to permit rotary movement of the upper barrel any number of degrees required to effect proper alignment without shutting down service or removing flange bolts and nuts. Hydrant must open turning operating nut to left (counterclockwise) and must be marked with an arrow and word “open” to indicate the direction to turn stem to open. All fasteners used shall be stainless steel.

Boot coatings to be fuse bonded epoxy or thermal set epoxy for interior and exterior-holiday free with minimum thickness 8 mils meeting or exceeding AWWA C550. Epoxy coating must be undamaged with no chips or abrasions. The lower barrel shall be bituminous coated or epoxy coated. Field touch-up of epoxy interior coating is not allowed. Field touch-up of exterior surfaces shall be in accordance with manufactures recoating specifications only. Contractors shall use special handling and installation precautions with the use of epoxy coated appurtenances as necessary to ensure that no coating system damage occurs. All epoxy appurtenances found mishandled at delivery or during installation shall be rejected and removed from the job site. Above grade exposed hydrant components shall be coated with one coat zinc rich urethane primer @ 2.5-3.5 mils dry film thickness. The hydrant barrel, breakaway flange, shall be coated with pherolic urethane enamel gloss aluminum, two coats @ 4.0 mils dry film thickness each coat. Topcoat shall produce a consistent and holiday free color coating. Caps and Bonnet shall receive two coats of gloss safety red, phenolic urethane enamel 4.0 mils dry film thickness each coat. Color coats shall produce a consistent and holiday free color coating. Surface shall be sand blasted to SSPC/SP-6 prior to coatings. All hydrants shall be shipped without chains. Manufacture shall provide a ten-year warranty on all parts and workmanship. Hydrant repair kits shall be original manufacture specifically designed for the hydrant. All hydrants shall also be manufactured to meet or exceed additional design and operating characteristics listed below:

Type:	5 ¼ inch valve opening/3 port style, dry barrel.
Opening:	Open left.
Depth of Bury:	5’-0” minimum from bury line to top flange of hydrant boot.
Ports:	Two 2 ½ inch bronze hose ports 180° apart NST

	thread.
	One 4 ½ inch bronze pumper/steamer 90° from each hose port, NST thread.
Breakaway:	All hydrants have traffic breakaway flange.
Drain Ways:	Sliding drain seal type. The drain channel shall be 360 degrees and contain a minimum of two bronze or brass sleeved outlet ports.
Coatings:	Prior to priming, sand blast hydrant to SSPC/SP-6 primed with zinc rich urethane compatible coating. Top coat with two coats each safety red conforming to KCWA standard color red barrel, cap and bonnet. Boot coatings to be fuse bonded epoxy or thermal set epoxy for interior and exterior – holiday free with minimum thickness 8 mils meeting or exceeding AWWA C550. Exterior lower barrel to be bituminous coated or epoxy coated.
Stem:	Stainless steel upper and lower stem. All wetted parts such as springs, pins and fasteners, shall be stainless steel or other compatible lead-free noncorrosive materials.
Main Valve:	Ductile iron or cast iron core fully encapsulated in rubber or multiple piece. The seat may be either bronze or stainless steel.
Weather shield and cap:	Ductile Iron.
Chains:	No chains to be supplied.

4.11 CORPORATION STOP:

Corporation stops shall be ball type with either stainless steel, Synthetic coated brass ball or nickel coated brass ball designed for potable water service up to 300 PSI. Body shall be heavy cast lead free "EnviroBrassII" UNS Alloy Number C89520 ASTM B584-98a and/or AWWA C800/ASTM B-62 meeting or exceeding the lead leaching performance specifications of ANSI/NSF 61 Standard. All corporation stops shall meet or exceed design standards of AWWA C800 along with the design and operating characteristics of the following:

Type:	Ford or equal.
Sizes:	$\frac{3}{4}$, 1 inch, 1 $\frac{1}{2}$ inch, and 2 inches
Opening:	Open left.
End Connections:	Compression with non-corrosive grip ring meeting ASTM B-159-Buna N Rubber and conductivity ring. The threaded end shall be AWWA CC taper thread for direct tap.
Material:	Heavy cast lead free "EnviroBrassII" UNS Alloy Number C89520 ASTM B584-98a and/or AWWA C800/ASTM B-62 meeting or exceeding the lead leaching performances specifications of ANSI/NSF 61 Standard.

4.12 CURB STOPS:

Curb stops shall be ball type with either stainless steel, synthetic coated brass or nickel coated brass ball designed for water service up to 300 psi. Body shall be heavy cast lead free "EnviroBrassII" UNS Alloy Number C89520 ASTM B584-98a and/or meet or exceed the lead leaching performance specifications of ANSI/NSF 61 Standard. All curb stops to meet or exceed the design standards of AWWA C800 along with the design and operating characteristics of the following:

Type:	Ford or equal.
Sizes:	$\frac{3}{4}$ inch, 1 inch, 1 $\frac{1}{2}$ inch, and 2 inches
Opening:	Open left.
End Connections:	Compression with noncorrosive grip ring meeting ASTM B-159-Buna N Rubber and conductivity ring.
Material:	Heavy cast lead free "EnviroBrassII" UNS Alloy Number C89520 ASTM B584-98a and/or AWWA C800/ASTM B-62 meeting or exceeding the lead leaching performance specifications of ANSI/NSF 61 Standard.
Opening:	Open left.
Drain:	None.

4.13 SERVICE & GATE BOX:

- 4.13.1 Curb boxes may be manufactured in North America or selected foreign made. Selected foreign made boxes must receive prior approval based on design and style samples to be provided for review. They shall be heavy pattern cast iron, buffalo style, slip adjustable type with heavy cast iron cover and brass bolt fastener type lock. The word "WATER" shall be cast upon the cover in heavy pattern raised letters. Covers shall be drop in type without fins solid ring. Boxes shall have a bituminous internal and external coating in accordance with ANSI/AWWA C151/A21.51 and ANSI/AWWA C153/A21.53 respectively. Boxes shall have barrels of not less than 2 ½ inch in diameter. The upper section of each box shall have a bottom flange of sufficient bearing area to prevent settling. The base of the lower section shall be a reinforced arch configuration and sized to enclose the curb stop. Box sections shall be of sufficient length to provide complete coverage for the depth of bury.
- 4.13.2 Gate valve boxes may be either manufactured in North America or selected foreign made. Selected foreign made boxes must receive prior approval based on design and style samples to be provided for review. They shall be heavy pattern cast iron, slip adjustable type and provided with heavy cast iron cover. Cover shall have the word "WATER" cast upon in heavy pattern raised letters 5 ¼ inch diameter. The cover shall be drop in type without fins solid ring. Boxes shall have a bituminous internal and external coating in accordance with ANSI/AWWA C151/A21.51 and ANSI/AWWA C153/A21.53 respectively. The upper section of each box shall have a bottom flange of sufficient bearing area to prevent settling. The bottom of the lower section shall be bell shaped and sized to enclose the stuffing box and operating nut of the valve. Boxes shall have barrels of not less than 5" in diameter. Box sections shall be of sufficient length to provide complete coverage for the depth of bury. The upper portion shall be 26" long and the bottom Section 48" (min) in length.

4.14 SADDLES:

Service saddles and repair saddles shall be ductile iron or type 304 stainless steel, with stainless steel bolts, washers, nuts and bands. Ductile iron components shall be coated with fusion bonded epoxy minimum 8 mils thickness meeting or exceeding AWWA C550 or nylon coated. Saddles shall be manufactured to meet or exceed the design and operating characteristics of following:

4.14.1 Service:

Type:	Ford or equal.
Body:	Ductile iron or grade 18-8 type 304 stainless steel.
Coating:	Ductile iron components shall be epoxy coated

	AWWA C 500 or nylon coated.
Band:	Grade 18-8 type 304 stainless steel double band.
Fasteners:	304 stainless steel stud, nut & washers.
Gasket:	Virgin rubber ASTM 2000.
Outlet:	Threaded outlet tapped to AWWA C 800 for the appropriate service size.

4.14.2 Repair:

Type:	Ford or equal.
Body:	Ductile iron or grade 18-8 type 304 stainless steel.
Coating:	Ductile iron components shall be epoxy coated AWWA C 500 or nylon coated.
Band:	Grade 18-8 type 304 stainless steel double band.
Fasteners:	304 stainless steel stud, nut & washers.
Gasket:	Virgin rubber ASTM 2000.
Outlet:	Threaded outlet tapped to AWWA C 800 for the appropriate service size.

4.15 FULL CIRCLE REPAIR:

All components and fasteners shall be type 304 stainless steel. The gasket shall be virgin rubber for water service. All repair clamps shall be manufactured to be equal to the material and design requirements the following:

Type:	Ford or equal.
Body:	Grade 18-8 type 304 stainless steel.
Fasteners:	304 stainless steel stud, nut & washers.
Gasket:	Grid pattern virgin rubber ASTM 2000, full 360 degree coverage.

4.16 DUCTILE IRON COUPLINGS:

Straight and transition couplings shall be ductile iron manufactured to meet AWWA C 219 and fitted with stainless steel bolts washers and nuts. Ductile iron components shall be coated with fusion bonded epoxy minimum 8 mils thickness meeting or exceeding AWWA C550. Couplings shall be manufactured to meet or exceed the design and operating characteristics of the following:

4.16.1 Straight:

Type:	Ford or equal.
Body:	Ductile iron.
Coating:	Ductile iron components shall be epoxy coated AWWA C 500.
Fasteners:	304 stainless steel stud, nut & washers.
Gasket:	Rubber ASTM 2000.

4.16.2 Transitional:

Type:	Ford or equal.
Body:	Ductile iron.
Coating:	Ductile iron components shall be epoxy coated AWWA C 500.
Fasteners:	304 stainless steel stud, nut & washers.
Gasket:	Rubber ASTM 2000.

4.17 BACKFLOW PREVENTERS:

All devices must have been approved by the University of Southern California (FCCCHR, USC), American Water Works Association and American Society of Sanitary Engineers. Backflow device assemblies tested with manufactures isolation valves to meet FCCCHR, USC standards shall be installed with the manufacturer valves as an assembly. Bronze or brass components shall meet or exceed the lead leaching performance specifications of ANSI/NSF 61 Standard or be manufactured with lead free “Enviro Brass II” USN Alloy Number C89520, ASTM B584-98a. The use of Victolic connections is allowed when the components are part of the USC approved device and these fittings meet NSF approval for potable water use.

4.17.1 Testable Double Check:

Type:	Watts or equal.
Body:	Cast iron, bronze or stainless steel depending on size.
Coating:	Iron components shall be epoxy coated AWWA C-500.
Springs:	Stainless Steel.
Pressure:	Maximum 150 psi Minimum 10 psi.

4.17.2 Testable Reduced Pressure:

Type:	Watts or equal.
Body:	Cast iron, bronze or stainless steel depending on size.
Coating:	Iron components shall be epoxy coated AWWA C-500.
Springs:	Stainless Steel.
Pressure:	Maximum 175 psi – Minimum 10 psi.

4.17.3 Household Dual Check:

Type:	Watts or equal.
Body:	Cast bronze.
Springs:	Stainless Steel.
Pressure:	Maximum 150 psi – Minimum 10 psi.

4.18 BACKFILL:

- 4.18.1 Pipe bedding shall be processed borrow gravel, granular in nature, the major portion of which may be sand or gravel. It shall be free from peat, vegetable or organic matter or any other debris and readily compactable. Recycled road sweepings and contaminated materials are forbidden.
- 4.18.2 Selected backfill may be from excavated materials that shall be free draining, clean, granular soil suitable for backfill. It shall be free from peat, vegetable or organic matter or any other debris and shall be readily compactable to the requirements of

Kent County Water Authority, type 5 trench. Recycled road sweepings and contaminated material are forbidden. Up to 20 percent may be rock like material, not to exceed 3 inch in length or diameter and must be evenly distributed within the total volume of the fill.