

# **Corporation of the Town of LaSalle**

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# 1 DESIGN STANDARDS: WATER

## 1.1 GENERAL

Watermains and Appurtenances shall be designed and constructed in accordance with the information specified herein. All chemicals and materials used in the drinking water system that comes into contact with water within the system shall meet all applicable standards set by MECP, the Ontario Water Works Association (OWWA) and the American National Standards Institute (ANSI) safety criteria standards NSF/60 and NSF/61. Any deviation from the specifications contained herein and/or proposed alternatives require approval in writings from the Town Engineer.

# 1.2 DESIGN CONSIDERATIONS

In order to establish watermain sizes, the Consulting Engineer is required to design potable water distribution using the following design criteria. The criteria was designed using current Town standards and the Design Guidelines for Drinking-Water Systems as detailed by the MECP. In addition to these written guidelines, reference should also be made to the approved manufacturer's most up-to-date model's products for linear water systems. Proposed development shall consult with the Town to ensure current design is within Town's current water model and standards.

### 1.2.1 FLOW CALCULATIONS

The Owner's Consultant shall propose the size of the watermain to accommodate the development. The watermain size shall be determined by the fire flow plus maximum day use. Peaking factors are based on the below chart:

Population Range	Minimum Rate actor (min. hour)	Maximum Day Factor	Peak Rate Factor (max. hour)
500 -1000	0.40	2.75	4.13
1001 -2000	0.45	2.50	3.75
2001 – 3000	0.45	2.25	3.38
3001 – 10000	0.50	2.00	3.00

10001 – 25000	0.60	1.90	2.85
25001 – 50000	0.65	1.80	2.70
5001 – 75000	0.65	1.75	2.62
75001 – 150000	0.70	1.65	2.48
> 150000	0.80	1.50	2.25

Fire flow testing is required for all development applications to establish and confirm boundary conditions for the development, and will provide the basis for the design proposal.

Fire flows shall adhere to the following criteria:

- Residential: Minimum fire flow = 30 l/s (based on MECP Guidelines)
- Other (based on the OBC 1997):

$$Q = K * V * S_{tot}$$

Where: Q = minim supply of water in litres

K = water supply coefficient (K = 39 (which covers major occupancy classifications A – F2))

V = total building volume in cubic meters

 $S_{tot}$  = total of spatial coefficient values from property line exposures on all side (max. value = 2)

Minimum Residential Pressures shall adhere to the following criteria:

- 140 kPa at max. day demands plus fire flows
- 275 kPa at max. hourly demand
- 350 kPa 550 kPa at max. daily flow

#### 1.2.1.1 HAZEN WILLIAMS EQUATION

$$Q = V * \pi * \frac{D^2}{4}$$

Where:  $Q = Discharge (m^3/s)$ 

D = Diameter of the pipe (m)

V = Velocity (m/s) as found in the below formula:

$$V = K * C * \frac{D^{0.63}}{4} * S^{0.54}$$

Where: K = 0.85 (for SI Units)

C = Hazen Coefficient

D = Diameter of the pipe (m)

S = Energy Slope (m/m) as found in the below formula:

$$S = \frac{H_f}{L}$$

Where:  $H_f$  = Head Loss (m)

L = Length of the pipe (m)

Hazen Williams Coefficient values:

Diameter (mm)	Coefficient Factor
150	100
200 – 250	110
300 - 600	120
> 600	130

#### 1.2.2 WATER DEMANDS

Water demands are to be calculated by the Design Engineer and approved by the Town Engineer. Custom demands for larger volume consumers or those with exceptional peak demands like ICI (Industrial, Commercial and Institutional) projects require special consideration regarding flow calculations.

For projects that require fire protection; the fire flow requires shall be determined through the Formula discussion in "Flow Calculations". A fire flow test will be required by the Owner on hydrants surrounding the project to determine if adequate water is available.

Water Demands should also take into account the following table:

Proposed Land Use	Avg. Daily Flow	Population Densities <sup>(1)</sup>
Chrysler Canada Greenway Extension/Hydro	0	
Corridor		
Employment <sup>(2)</sup>	35 m³/Ha/d	78 people/Ha
Golf Course	95 l/patron/d	4 patrons/Ha
Highway Commercial <sup>(3)</sup>	28 m³/Ha/d	62 people/Ha
Institutional — Heavenly Rest Cemetery (29.8 Ha)	0.12 m³/Ha/d	0.3 people/Ha
— Other (4.9 Ha) (assumed school)	140 l/student/d	165 students/Ha
Neighbourhood Centre	28 m³/Ha/d	62 people/Ha
Park/Open Space <sup>(5)</sup>	1.4 m³/Ha/d	3 people/Ha
Recreation Complex <sup>(6)</sup>	4.2 m³/Ha/d	10 people/Ha
Residential	450 l pcd	60 people/Ha
School	140 l/student/d	165 students/Ha
Stormwater Management Pond	0	
Town Centre (Mixed Use)	36 m³/Ha/d	80 people/Ha
Woodlot/Natural Corridors	0	

1. Refer to Appendix 1 – Detailed Calculations for Equivalent Populations

2. Based on light industrial

3. Commercial/Big box

4. Heavenly Rest Cemetery – sewage flows based on the assumed fixtures of 3 wash basins and 2 water closets.

5. Assumed each park (total of 5) has one washroom facility (men and women) – sewage flows based on the assumed fixtures of 2 urinals, wash basins and 3 water closets

6. Based on 2,500 people and 100 l/person/day

### 1.3 WATERMAINS

### 1.3.1 MINIMUM SIZE

Sizing and looping of watermains will be discussed at the preliminary stage of the project. The Town requires a minimum pipe diameter of 200 mm. Unless required, all watermains within the right-of-way shall be designed for 1, 035 kPa (150 psi) test pressure.

### 1.3.2 LOCATIONS

Pipes shall be laid in an evenly graded trench to provide a minimum of 1.5 m cover below future or existing road grades, whichever is lower. Care must be exercised to prevent deformed sections in the pipe caused by excessive bending. All deformed sections shall be removed and replaced at the Owner's expense. A separation of 2.5 m paralleling sewer service is required.

### 1.3.3 FITTINGS

All PVC fittings shall be restrained in accordance with Standard Drawing L-WD-01. Refer to the section 3.11 Material Specifications for approved materials. Tie in and Thrust Blocking as per Applicable Standard Drawing L-WD-02.

### 1.3.4 BACKFLOW PROTECTION FOR WATERMAIN CONSTRUCTION IN THE RIGHT-OF-WAY

Contractors will be required to follow backflow prevention procedures as required by the MECP. Backflow devices are to be supplied by the contractor and up to date certification.

Applicable Drawing: L-WD-17, L-WD-18, L-WD-19 (same as section 3.10 Backflow Prevention in Buildings)

### 1.3.5 DEAD-END MAINS

Dead-end mains are to be avoided wherever possible. Where dead-ends cannot be avoid, dead-ends on new mains shall be closed with cast iron plugs or caps; such dead ends shall be equipped with suitable blow-off facilities. Auto flushers may also be required as a temporary measure where developments are phased and required by the Town Engineer.

#### 1.3.6 ABANDONMENTS AND SERVICE DISCONNECTIONS

Watermains to be abandoned shall be capped or removed as decided by the Town. All service disconnects are to be completed by the Owner and inspected by the Town.

### 1.3.7 EASEMENTS

The Engineer shall also consider the soil conditions and constructability and future maintenance when selecting the easement width. In addition, if more than one utility is installed in the easement, the easement width should be increased by the separation distance of the utilities.

The minimum easement width shall be 6.1 m for all watermains.

### **1.3.8 TRENCH REQUIREMENTS**

The trench shall be excavated of sufficient as specified in Part III of The Occupational Health & Safety Act, 1980 and Regulations for Construction Projects, and the proper laying and jointing of the pipe. Trench walls shall be vertical to 300 mm (12 in.) above the top of the pipe and the width at this location shall not exceed the maximum. Trench width for a single pipe shall be as per Standard Drawing L-WD-03.

### 1.3.9 REPLACEMENT OR INSTALLATION OF SERVICE FROM MAIN TO PROPERTY LINE

A new service shall be installed from the new main to property line as per Applicable Standard Drawings

The new curb stop shall be installed as close as possible to the property line.

### 1.4 TRACER WIRE

A tracer wirer shall be used with all PVC pipes and hydrants. The wire shall be installed along the side or top of the pipe as close to the pipe as possible. The tracer wire shall be brought to the surface at all fire hydrants and valve locations. Refer to the section <u>3.11 Material Specifications</u> for approved materials.

Applicable Standard Drawing: L-WD-04 (WUC 50.12.01)

### 1.5 MAINLINE VALVES

Mainline valves shall be the same size as the watermain. A valve box shall be provided for every valve. Refer to the section <u>3.11 Material Specifications</u> for approved materials.

### 1.5.1 GATE VALVES

The Town of LaSalle prefers the use of gate valves for pipes 100 mm to 600 mm. Any pipes above 600 mm requires the Contractor to consult with the Town Engineer. Refer to the Material Specification section for approved materials.

### 1.5.2 TAPPING VALVES

Tapping valves are allowed if they are a stainless steel type as approved by the Town Engineer. Refer to the Material Specification section for approved materials.

### 1.5.3 NUMBER AND LOCATION

Two valves are required to isolate a tee intersection and three valves are required to isolate a cross intersection. These valves are to be located close to the intersecting pipes if possible. Valve required on each side of a railway crossing or at each end where the watermain is installed in a casing or under a drain crossing.

Valves are to be placed at intersections and the spaced at a maximum of 250 m.

### 1.5.4 VALVE BOXES AND VALVE BOX PROTECTION

All valves shall be equipped with valve boxes and restrained, unless installed in a chamber. Valve boxes shall be two-piece screw type to suit the size of valves. Valve boxes shall not rest on the valve.

All main line valve boxes are to be protected during construction and during the maintenance period.

### 1.6 HYDRANTS

Hydrants are to adhere to the specifications as described in the Town of LaSalle's list of approved products: Refer to the section <u>3.11 Material Specifications</u> for approved materials.

The Consulting Engineer shall obtain the Fire Chief's written approval of fire hydrant location. The Owner is required to seek preliminary approval from the Fire Chief. This may require flow testing on existing hydrants. Once the Fire Chief is in agreeance with the concepts for fire protection, the Owner can continue on with engineering and design of servicing.

All hydrants shall stand plumb and shall have their nozzles parallel with, or at right angles to the curb (road) with the pumper nozzle facing the road.

In order to prevent confusion of availability of water for firefighting purposes, immediately after installation, all hydrants shall be covered with neutral coloured plastic covers, secured to prevent removal. This cover shall be removed only after the watermain has been completely installed, tested and approved for use by the Owner.

Applicable Standard Drawing: L-WD-05 and L-WD-06.

### 1.6.1 SPACING

Hydrants are to be installed on 150 mm diameter and larger watermains are to be spaced at intersections and at a maximum of 150 m and meet minimum spacing requirements for all proposed dwellings. The maximum spacing may be altered at the Fire Chief's request.

When replacing existing hydrants use the same location if possible. If a new location is required, notify the homeowner in writing prior to engineering approval and provide proof of notification to the Town. Where an existing hydrant does not meet current spacing standards, the current standard shall apply.

### 1.6.2 LOCATIONS

The location of the hydrants in relation to the street line shall be in accordance with the Town of LaSalle approved relevant cross-sections. Any non-standard locations will require individual approval. Hydrants are to be located at intersections.

Hydrants near driveways shall be located at a minimum of 1.2 m clear from the projected garage (or edge of driveway, whichever is greater) in residential applications and 2.5 m separations in ICI areas. Where boulevard grass is limited, hydrant leads may require an additional 90° lead turn T and valve. Hydrants shall be 5 m from street trees.

If subsequent changes are made to the property or design during construction (i.e. driveway widening, entrance feature, etc.), all costs associated with the relocation shall be borne by the Owner, Builder or property owner.

### 1.6.3 DEPTH OF BURY

The depth of bury for the hydrant shall be 1.65 m unless otherwise stated by the Town. The hydrant safety breakaway flange must be located between 50 mm and 100 mm above finished grade and field adjusted if required. Hydrant extension to adjust the length of a hydrant barrel, if necessary, shall be obtained from the manufacturer supplying the hydrant and installed as per manufacturer's direction.

### 1.6.4 PRIVATE HYDRANT MAINTENANCE

The Owner, for private hydrants on private property, must allow Town to access hydrants to conduct annual maintenance. The Owner will be charged for the annual maintenance as per user fee by-law.

# 1.7 WATER SERVICES

All water services shall be single service connections and be supplied as described:

All unutilized water services shall be abandoned at the watermain with valve or curb box removed. Services being utilized for future re-development can be abandoned at the curb box or valve box at the property line.

Private Service connections to the watermain will not be permitted until the watermain has been tested, chlorinated and accepted for service. Dry taps will not be permitted.

### 1.7.1 SERVICE SIZING

The minimum nominal service size shall be 19 mm from the watermain to the property line. The maximum nominal service size shall be 250 mm from the watermain to the property line.

For pressure testing of a fire service line systems, must be tested to 1035 kPa (150 psi) for 2 hours.

The service shall not exceed the diameter of the watermains. The material type shall be as per <u>Section</u> <u>3.10: Material Specifications</u>.

### **1.7.2 SERVICE LOCATION**

Water services must be installed perpendicular to the road and/or the watermain. Wherever practical the service shall be installed in the center of the lot frontage. All water services shall have a 2.5 m horizontal separation from all sewers and 1.2 m vertical clearance from structures.

In cases where a fire and domestic service are required one connection from the watermain is made and branched off into two services before the property line. In situations where a fire service is required and a public hydrant is not at a sufficient location to the Siamese connection a private hydrant must be installed. This hydrant must be maintained annually.

### **1.7.3 SERVICE TRANSFER**

Under certain conditions if the existing service is of copper, the Town may decide to transfer the existing service to the new main.

The following procedures must be strictly adhered to;

- 1. Expose and clean surface of main pipe in preparation for tapping.
- 2. Install stainless steel tapping saddle on all watermains.
- 3. Install corporation main stop. Proceed to tap using an approved tapping machine.
- 4. Locate, expose, and clean old water service at the old water main to allow old main stop to be shut and old water service replaced.
- 5. A minimum of 1.0m clearance is recommended at the sides of both water mains to allow proper service pipe installation. Prior to cutting away old metallic water service,
- 6. Contractor must install a temporary jumper connection. Install ground plate. Notify homeowner of water disruption (give ample notice prior to shut off).

Service transfer in ROW shall be as per Standard Drawings L-WD-12.

#### **1.7.4 SERVICE ABANDONMENTS**

Water services to be abandoned based on future usage of said service. If the service is to be used again in the near future it is to be abandoned at the valve at the property line. If the service is not to be re-used then it is shall abandoned at the watermain. Abandonment of watermains to be completed by the Owner and must be approved by the Town.

### 1.7.5 PIPE CROSSING AND CLEARANCE

All water services to be 1.5 m in depth. Where the above mentioned requirements cannot be satisfied, the Owner's Contractor must get approval from the Town Engineer.

Sanitary sewers and watermains located parallel to each other shall be constructed in separate trenches, maintaining a minimum clear horizontal separation distance of 2.5 m from outside edge to outside edge of the pipe. When it is not possible to maintain a separate trench and the minimum horizontal separation distance, the crown of the sewer should be at least 0.5m below the invert of the watermain and separated by in situ material or compacted backfill.

Where a crossing of a sanitary sewer and watermain is required, the watermain should cross above the sewer whenever possible. Whether the watermain crosses above or below the sewer, a minimum vertical distance of 0.5 m between the outside edge of the watermain and the outside edge of the sewer should be provided to allow for proper bedding and structural support of the watermain and sewer pipes.

Applicable Standard Drawing: L-WD-07 (WUC 50.01.03)

### 1.7.6 MAIN STOPS AND CURB STOPS

All water services shall have the same size mainstop as the service pipe. Mainstops are not required on water services greater than 50 mm diameter.

Service Saddles are required for all services connected to concrete pressure pipe manufactured to the latest edition of AWWA C301 and AWWA C303 specifications for all tap sizes.

Main stops or corporation curb stops shall be copper compression type conforming to AWWA C800. All services shall have curbs stops and boxes installed at the property line, be flush with grade and accessible at all times. Non-Draining curb stops are to be used. Curb stops shall be supported with concrete blocks or bricks.

For residential applications, all water service curb stops and boxes are to be installed in grass areas with a minimum distance of 1 m from the edge of the driveway if possible.

### 1.7.7 METERING

All water services shall be metered. All meters shall be accessible at all times. Refer to the section <u>3.11</u> <u>Material Specifications</u> for approved materials. Meters shall not be installed until flushing and testing is complete.

Applicable Standard Drawings: L-WD-08 and L-WD-09

#### 1.7.7.1 METER CHAMBERS AND PITS

Meters in chambers or in pits shall be as per the Towns Standard Drawings. Meters shall not be installed until flushing and testing is complete.

### 1.7.8 SERVICING VACANT LOTS

All materials shall be as per the Town of LaSalle specifications as described herein. The Owner pay a construction rate that begins when connections to curb box is made until the meter is installed.

#### 1.7.8.1 EXISTING WATER SERVICE AT THE PROPERTY LINE

Water service request is created through the building permit process. Inspection is scheduled and completed by the building department. Applicant is to call the Public Works Department a minimum of 48 hours in advanced for meter installation. Meter must be installed prior to occupancy being granted.

#### 1.7.8.2 NO WATER SERIVCE AT THE PROPERTY LINE

Water service request is created through the building permit process. The fee of a 19 mm (3/4") service is collected at this time. This fee covers meter supply and installation.

Applicant must specify that a service and tap to the watermain is also required. This should be communicated verbally as well as noted on the building permit applicant.

The Applicant retains a Contractor that is licensed and bonded with the Town of LaSalle to carry out the work; the Applicant is required to obtain the list from the Public Works Department. Water Service Tap fee will be as per the Towns fee by-lay. The Town to perform the tap at the watermains. All other works such as excavation, traffic control, backfilling, restoration, and materials are to be carried out by Owner. The fee will be billed to the Contractor upon completion of the work. All restoration within the Right-of-Way is to be done as per the Town of LaSalle standards.

# **1.8 CATHODIC PROTECTION**

All metallic underground appurtenances are to have a non-woven synthetic fabric tape fully impregnated with a special blend of adhesive compound based on petrolatum polymers applied. Installers of this tape are to be properly trained as per manufacturer's standards. All mechanical parts that are not PVC must be corrosion protected with Denso Paste; it is applied prior to the tape application (Denso Petrolatum Tapes or Denso Bituminous Tapes). Denso Profiling Mastic will be used to provide a smooth profile on irregular shaped fittings such as flanged and mechanical joints and valves.

Anodes are to be used when connecting new watermains to an existing watermain line. Refer to the section <u>3.11 Material Specifications</u> for approved materials.

# 1.9 TESTING PROCEDURE

### 1.9.1 PRESSURE TESTING

Prior to pressure testing and disinfection, the Engineer and a licensed water operator from the Town shall inspect the installation. During this inspection, each and every valve will be checked using the proper valve operating key. Each valve must fully open or close as required.

Pressure tests shall be witnessed by the Engineer and the Owner.

The Contractor shall notify the Engineer and the Owner at least 48 hours in advance of the intended testing time. The Owner shall be charged for the Town's time and any sampling costs.

The Contractor is responsible for:

- Supplying pressure tester
- Chlorination
- Backflow prevention
- De-chlorination

The Town is responsible for:

- Witnessing the procedure
- Attaining chlorine and microbial samples

The test pressure shall be 1035 kPa (150 psi) for a period not less than two (2) hours. Maximum permissible leakage shall be 2.22 litres per day per mm diameter per km of pipe. Work to be done as per the most current Ontario Watermain Disinfection Procedure.

After the pressure test passes, the new system is filled with highly chlorinated water using continuous feed method with chlorine concentration >25mg/L.

Work to be completed as per Applicable Town of LaSalle's Standard Drawings.

#### **1.9.2 FLUSHING AND DISINFECTING WATERMAINS**

Flushing and disinfecting operations shall be carried out in accordance with the MECP and the requirements of the Town. The Town shall be notified at least 48 hours in advance of the proposed date on which disinfection operations are to commence. The Contractor shall de-chlorinate and flush.

The discharge of chlorinated water shall be in accordance with "Environmental Construction Guidelines for Municipal Road, Sewage and Water Projects" by Municipal Engineers Association, Appendix 'B'.

Watermains shall be swabbed and flushed in a sequence and in accordance with the procedure set out by the Engineer and the Town Engineer. The Engineer may permit or require the flushing to be carried out in stages as sections of the system are completed. No unsuitable matter shall be allowed to enter the sections which have been flushed. A soft foam swab is to be inserted into the main at the filling end.

Once swabbing is complete, water from the existing distribution system shall be allowed to flow at a controlled rate into the new pipeline until flushed and full then the control valve shall be closed immediately. The system shall be tested for residual, documented and left charged with the chlorine solution for 24 hours. All valves and hydrants shall NOT be operated during the 24-hour period.

The chlorine residual will be re-tested in the section after 24 hours. The maximum allowable decrease in chlorine concentration is 40% of the initial chlorine concentration to a maximum decrease of 50 mg/L.

Once acceptable, the section shall be flushed completely and recharged with water normal to the requirements. The chlorination procedure shall be repeated until satisfactory results are obtained. If chlorine residual tests are satisfactory, microbial testing (by an accredited facility) must be carried out on two consecutive days (maximum one every 24 hr. period).

The system shall not be put into operation until approved by the Town.

Sample stations shall be installed where the Public Works Department deems necessary.

Work to be completed as per Applicable Town of LaSalle's Standard Drawings.

### 1.9.3 TRACER WIRE TEST

The Town is to perform a Tracer Wire Test, and the Contractor is responsible for repairing any disruptions found in the test.

# 1.10 BACKFLOW PREVENTION IN BUILDINGS

Installation of backflow prevention devices and all other procedures related to potable drinking water and such are to be to the standard as described by the Cross Connection and Backflow Prevention By-Law #7847. It applies to industrial, commercial, institutional and multi-residential buildings and structures except buildings of residential occupancies.

All new ICI buildings require backflow prevention device to be installed right at the point of entry to the building. Such a device would be determined by the Town building inspector. Isolation and backflow prevention must be maintained when constructing new Municipal Watermains.

Materials shall be installed as per <u>Section 3.11: Material Specifications</u>.

# 1.11 MATERIAL SPECIFICATIONS

The Contractor is required to utilize the materials for all objects related to distribution of the potable water system in the Town as specified in the tables below:

Product	Specification	Manufacturer	Description/Model No.
Pipes	•		
PVC pipe 100 mm – 300 mm (4'' – 12'' dia.)	PVC Class 150 DR-18 AWWA C900, CSA-B137.3 Capped in Factory, blue in colour	IPEX	Blue Brute & Bionax
		REHAU	Aqualoc
		NAPCO	CIOD PVC Pressure Pie
PVC Pipe 350 mm – 400 mm (14" – 16" dia.)	PVC DR-18 (Pressure rated 235 psi) AWWA-C905, CSA-B137.3 Capped at Factory, Blue in Colour	IPEX	Centurion
PVC Pipe	PVC DR-25	IPEX	Centurion

(18" – 24 '') Prior approval required	AWWA-C905, CSA-B137.3 Capped at factory, Blue in colour		
Concrete Pipe	Concrete Pressure Pipe	HYPRESCON	
350 mm – 500 mm	AWWA-C303		
(14" – 20" dia.) High Density Polyethylene	Min. class 14 as approved by TOL High Density Polyethylene DR-11	IFRA PIPE	SCLAIRPIPE
pipe	Ductile Iron Pipe Size (DIPS)		
100 mm – 1575 mm	Pressure rating of 160 psi		
(4" – 63" dia.)	AWWA-C906, CSA B137.1, ASTM D3035/D3350, CGSB 41-GP-25M		
Pipe End Caps	OPSS 441.07.07. Tamper evident seals to		
<u> </u>	display manufacturer or logo.		
Service Piping Copper	Copper tubing	Great Lakes Copper	
19 mm – 50 mm	AWWA-C800	Creat Lakes Copper	
(3/4" – 2" dia.)	Certified ASTM B88-49	CERRO	CERROTUBE
	Type "k" soft copper		
Polyethylene 25 mm – 50 mm	Polyethylene Class 160 CTS AWWA-C901	IPEX LEGEND	BLUE904 AquaPure PE-RT
(1" – 2" dia.)	CSA B137.1	REHAU	Municpex
, , , ,			
D.I. Stand pipes	"Ductile Iron Pipe, Centrifugally Cast for		
	Water"		
Foam Swabs	ANSI/AWWA-C151/A21.51 High Density Polyurethane for Pipe Cleaning		High Density Polyurethane for Pipe
roam Swaps	to fit 100 mm - 300 mm $(4^{\circ} - 12^{\circ})$ dia.)		Cleaning to fit 100 mm - 300 mm
Fittings			
D.I Bends, Tees, Reducers	ANSI A21.10	SIGMA	Notes: Furnished with push-on Tyton
and Crosses LONG BODY	AWWA C153/C111 Cement Mortar lined as per ANSI A21.4	STAR	Joints as per ANSI A21.11 (AWWA- C111)
	(AWWA-C104)	01/11	Only used for tying into existing
		<b>BIBBY/TYLER/UNION</b>	watermains or on special approval
D.I Bends, Tees, Reducers	ANSI A21.10	SIGMA	Notes: Mechanical type ends
and Crosses	AWWA C110	STAR	51
COMPACT FITTINGS SHORT BODY	Cement Mortar lined as per ANSI A21.4 (AWWA-C104)	BIBBY/TYLER/UNION	
D.I Bends, Tees, Reducers	PVC AWWA-C907 Class 150	IPEX	Blue brute injection-molded PVC
and Crosses	CSA-B137.2		100 mm – 400 mm (4" – 16")
	UL listed and FM approved	HARCO	Injection-molded PVC 100 mm – 200 mm (4'' – 8'')
Transition Couplings	To AWWA C-219	VIKING JOHNSON	Maxifit and Large Diameter Maxifit
	Sleeve -Ductile Iron	FORD	Flex FC2w & FC1 (100 mm - 300 mm)
	minimum - ASTM A 536 End Rings -Ductile Iron		, , ,
	ASTM 536 Grade 65-45-12	ROMAC	XR501 (100mm to 300mm)
	Bolts and Nuts	ROBAR	TC400 (300mm to 2400mm) 1406 (100mm to 600mm)
	Stainless steel OR Carbon Steel Exceed ASTM A 307	STRAUB	Straub Flex/Open & Straub Grip
	Epoxy coated to AWWA C-213		
		SMITH BLAIR	Series 441, 441 (100 mm – 400 mm)
2 Bolt Coupling	To AWWA C-219	SMITH BLAIR	Series 411 (450 mm – 500 mm) Series 421
2 Bolt Godpinig	Epoxy coated to AWWA C-213	ROBAR	1696-2B
	Stainless steel or Carbon steel	HYMAX	Hymax 2
	exceed ASTM C-213 304 Stainless steel bolts and nuts		Macro HP
Flonged Courting			
Flanged Couplings	To AWWA C-219 Sleeve -Ductile Iron or carbon steel	SMITH BLAIR	OMNI 912 Series ( 100 mm – 300 mm)
	Minimum - ASTM A 536	ROBAR	7400 Series ( 100 mm – 300 mm)
	End Rings -Ductile Iron		
	ASTM 536 Grade 65-45-12 Bolts and Nuts, Stainless Steel or	ROMAC	FCA 501 (100 mm – 300 mm)
	Carbon Steel exceed ASTM A 307	1	
	Epoxy coated to AWWA C-213	FORD	Flex FFCA (100 mm – 300 mm)

Reducing Couplings	Sleeve -Ductile Iron	FORD	Flex FRC
	Minimum - ASTM A 536 End Rings -Ductile Iron	SMITH-BLAIR	415
	ASTM 536 Grade 65-45-12 Bolts and Nuts, Stainless Steel or	ROBAR	1506R & 1508R
	Carbon Steel exceed ASTM A 307 Epoxy coated to AWWA C-550	ROMAC	RC501 & RC400
Dura in Olympia			
Repair Clamps	Band – stainless steel Type 304, 18 gauge with tapered conductivity pad	CAMBRIDGE BRASS	Series 425 Teck (100 mm – 300 mm) Series 835 Teck (350 mm – 500 mm)
	Lugs – ASTM A536 epoxy coated Gasket - Grade 60	FORD	FS1 (100 mm – 300 mm) FS3 (400 mm to 600 mm)
	Bridge Plate - stainless steel bolts - Stainless Steel to ASTM A325 or A242	SMITH BLAIR	series 261, 262 (100 mm – 300 mm) series 263 (350 mm – 600 mm)
	Nuts - Type 304 Teflon coated	ROBAR	Robar5616 (100 mm – 300 mm)
		STRAUB	Robar 5636 (350 mm – 750 mm)
		CONCORD	D76R-Series 200 (100 mm - 350 mm)
PVC Repair Coupling 100mm to 300mm (4" to 12"	AWWA C907 Injected molded PVC CSA B137.2 PVC gasketed fittings ASTM D1598	IPEX - Blue Brute Molded PVC Fittings	073404, 073406, 073408, 273529, 273530
Thrust Blocks	OPSS 1350, 20mpa at 28 days		
Concrete Thrust Restraining Devices (	10mpa as per OBA Mechanical)		<u> </u>
Thrust Restraint Device For PVC Pipe	Gland Ring to ASTM 536, Ductile Iron, Side square head clamping bolts and hex nuts to ANSI B 18.2.1 and zinc plated to ASTM A 153.	FORD	Uniflange 1300C w/ mech joint/push on Uniflange 1350C for pipe bell joints Uniflange 1400C MJ retainer gland
	Sizes compatible to AWWA C900 & C905 PVC Extra-long T bolts to AWWA/ANSI	STAR	restraint 1000G2, 4000, & 4000G2 MJ fittings
	C111/A21.11		only 1100G2 for pipe bell joints
			1200G2 PVC fittings only 4300 series
		CLOW	Series 300 & 360 Restrainers
		SIGMA	Series PWP for pipe bell joints
			Series PWM MJ fittings only
			Series PWPF PVC fittings only
		EBAA IRON	Series 1500 & 1600 for pipe bell joints
			Series 2000 MJ fittings only
			Series 2600 PVC fittings only
Thrust Restraint Device	High Tensile Ductile iron to	FORD	Uniflange Series 1400
for Ductile or Cast Iron Pipe	ASTM A 536. dimensions to suit Mechanical fittings made as	EBAA IRON	Megalug Series 1100
	per	CLOW	Tyler Union TufGrip Series 1000
	ANSI/ AWWA C111/A21.11and ANSI/ AWWA	STAR	Series 3000 & 4300
	C153/A21.53 T bolts and nuts to AWWA C 111	SIGMA	One-Lok SLD
Thrust Restraint Device	High Tensile Ductile Iron to	SIGMA	Series PWPF PVC fittings only
for PVC pipe	ASTM A 536		Series PWP for pipe bell joints
(Molecularly oriented PVC	T bolts and nuts to AWWA C-111	01 011	Series PWM MJ fittings only
	CSA B137.3.1-09 certified AWWA C909 and NSF 61 certified	CLOW	Series 300, 360 & 390 Restrainers
		STAR	3500PF & 1200R PVC fittings only
			3500C & 1100C for pipe bell joints 3500, 1000C, & 4000G2 MJ fittings
			only
			series 4300
		FORD	Uniflange Series 1369 PVC fittings only
			Uniflange Series 1399 & 1559 for pipe bell joints
			Uniflange Series 1309-C MJ fittings only
		EBAA IRON	Series 1900 for pipe bell joints
Gland Rings for MJ/Dismant Dismantling Joints	ling joints/Flange Adapters Flanged adaptor body to be carbon steel per	Smith-Blair	Series 971, 972 and 975

	ASTM A36. Follower flange to be ductile iron		
	per ASTM A536, steel section per ASTM A576 GR1020HR. Finish to be fusion bonded flexi-		
	coat epoxy. Flanges to be carbon steel per AWWA C207, Class D		
Flange Adapters for DI pipes Size 100 mm - 300 mm.	High Tensile Ductile iron to ASTM A 536. Grade 65-45-12	FORD	Uniflange Series 200 & 400
(4" - 12" dia.)	colour code red for D.I .O.D. Gasket - EPDM Drilling-ANSI B16.1 for cast iron flange and ANSI B 16.5 for steel Flange	CLOW	Series 40
Flange Adapters for PVC pipes Size 100 mm – 300 mm	High Tensile Ductile iron to ASTM A 536. Grade 65-45-12 colour code red for D.I.O.D.	FORD	Uniflange Series 900
(4" -12" dia.)	Gasket - EPDM Drilling-ANSI B16.1 for cast iron flange and ANSI B 16.5 for steel Flange	CLOW	Series 90-C
MJ Gland Rings	Ductile Iron to ASTM A 536 pressure rated	<b>BIBBY/TYLER/UNION</b>	D011 – D014
For MJ Fittings Sizes 100 mm - 300 mm	same as the pipe rating Asphaltic coating	SIGMA	FMC9149 – 9152
(4" - 12" dia.)	manufactures identity stamped or casted as per AWWA C111 & C153	STAR	MJG06, MJG08, MJG10, MJG12
Hydrants			
Hydrants Valves Gate Valves non rising stem 100 mm - 300 mm (4" - 12" dia.)	AWWA C-502 3-Way Dry Barrel Type Barrel - Two piece with Break away Safety Flange operating nut- CSA 1.5"(37mm) Square open to the left (Counter clockwise) Externally Plugged. 2- 65(2.5") mm hose connection AND ONE 4" Storz nozzle 6" M.J. Shoe 1650mm in bury length unless stated otherwise Exterior above ground - One coat neutral Orange Rust inhibitive Primer and one coat quick dry brushing enamel - Yellow in Colour Ductile under- Ground portion of Hydrant shall be coated with Bitumen. Type 316 Stainless Steel Nuts and Bolts on boot Assembly All interior epoxy coated. Use food grade lubricant on hydrants only. Hydrant bases shall be 150 mm mechanical joint. Each hydrant shall have a shut-off valve. AWWA C-509 & C-515 Red Operating Nut, open clockwise pressure rated to minimum of 200psi Non rising stem Epoxy coated inside and out to C-550 Fully	CLOW CANADA MUELLER CANADA/ CANADA VALVE	McAvity Brigadier M67B         Century & Darling B-50 & B-18         Image: Constraint of the second
Gate Valves	encapsulated Resilient Wedge Mechanical joint only for 250 mm (10") and 300 mm (12") AWWA C-509 & C-515 Red Operating Nut,	CLOW	C.I. MODEL 2640
non rising stem	open clockwise pressure rated to minimum of		D.I. MODEL 2638
> 300mm (> 12")	200psi Non rising stem Epoxy coated inside and out to C-550 Fully Encapsulated Resilient Wedge mechanical joint only	MUELLER	SERIES A-2361
Tapping Valves 100 mm - 300 mm (4" - 12" dia.)	2" sq. Red Operating Nut pressure rated to minimum of 200psi. opening clockwise, one end mechanical unless specified as flanged	MUELLER	SERIES A-2361
( <del>4</del> - 1∠ uia. <i>)</i>	Non Rising Stem Bronze stem Resilient Seat, complete with paper Gasket,	AVK	SERIES 45 (FULL WALL) SERIES 65 (REDUCED WALL)
	fully encapsulated wedge with Elastomer	CLOW	C.I. MODEL 2640 D.I. MODEL 2638

	minimum 8 mm thick Epoxy coated inside only C/W 8 - 3/4" X 4" UNC Type 316 S/Steel	EJ	SERIES 2500
	Hex Head Nuts & Bolts To meet A.W.W.A Specification C-509, C-515 & C-550		
Tapping Valves	2" sq. Red Operating Nut opening clockwise	Requires prior approval	
400 mm - 600 mm (16" - 24" dia.)	one end mechanical unless specified as flanged	from THE TOWN	
	Non Rising stem Bronze stem Resilient Seat, complete with paper Gasket fully encapsulated wedge with Elastomer		
	minimum 8 mm thick Epoxy coated inside only C/W 8 - 3/4" X 4"		
	UNC Type 316 S/Steel Hex Head Nuts & Bolts to meet A.W.W.A		
	specification C-509, C-515 & C-550		
Backflow Preventers	C-309, C-313 & C-330		
Reduced Pressure Principle	Reduced pressure principle back flow	WATTS	
Backflow Preventer (RP)	preventer as per CSA B-46.10 and the Town	WILKENS	
	of LaSalle Backflow Prevention By-law.	FEBCO	
Tapping Sleeves & Service S			
Service Saddles	Saddle Clamp, Single Band, 2-Bolt Stainless Steel, 18 gauge AWWA Tapper Outlet, Stainless Steel Nuts	CAMBRIDGE BRASS	TECK 8403-BW, TECK 8410, 8413, 8415
	and Bolts, Fluorocarbon Teflon coated. 19 mm - 50 mm ( 1" to 2")	SMITH-BLAIR	SERIES 370
	Belleville Washers required on all saddles	ROBAR	2616
Tapping Sleeves for PVC and Iron Mains	Pressure rated to175 psi, min test pressure of 200psi	FORD	Fast Series
100 mm - 300 mm (4" - 12" dia.)	Body, Lugs and neck: Full circumference band 18-8 Type 304 Stainless steel, 18 gauge	ROBAR	6606
	Flange as per AWWA C-207 class D 18-8 Type 304 Stainless Steel, Steinless steel stude and note 10.0 Type 204	ROMAC	SST
	Stainless steel studs and nuts 18-8 Type 304 with Type 304 stainless steel and Nylon Washers- Fluorocarbon / Teflon Coated	SMITH-BLAIR	663
	19mm (3/4") NPT bronze test plug with square head. Nitrile Gaskets	POWERSEAL	3480AS
Tapping Sleeves for PVC and Iron Mains	Pressure rated to100-150 psi, 18-8 Type 304 Stainless steel, 18 gauge		Requires approval from the Town
400 mm - 600 mm (16" - 24" dia.)	Flange as per AWWA C-207 class D 18-8 Type 304 Stainless Steel,		
(10 21 0.0.)	Stainless steel studs and nuts 18-8 Type 304 with Type 304 stainless steel and Nylon		
	Washers- Fluorocarbon / Teflon Coated		
	19mm (3/4") NPT bronze test plug with		
	square head Nitrile Gaskets		
Tapping Sleeves for	Body - ASTM 283 Gr. C or	HANSON	Prior he Town and manufacturer
Concrete pressure pipes	Mild steel plate ASTM A36	SMITH-BLAIR	approval required
Outlet greater than 100 mm – Strap Type	Flange AWWA C 207 Class D ANSI 150 or MSS - SP 60 Gasket Nitrile		
	Straps Type 304 stainless steel or ASTM 36,		
	18 gauge Type 304 stainless steel bolts and nuts		
	Grout Pipes ASTM A 53		
Tapping Sleeve for Concrete pressure pipes. Outlet	As per manufacturer recommendations. Prior approval by the Town required.		
greater than 100 mm			
Gaskets			
Rubber Gaskets for Push on	CAN/CSA-B137.3 and have a minimum	IPEX ROYAL	
Joints	pressure rating of 1100 kPa Flexible elastomeric seals (SBR) as per ASTM	ROYAL DIAMOND	
	D-3139, also AWWA C-111 Sec. 4.4.4	REHAU	

Rubber Gaskets for M.J.	Size, mould number, manufactures mark,	SIGMA	PTL (04, 06, 08, 10, 12 SERIES)
fittings	country, year of manufacture shall be moulded	STAR	MJGAS (04, 06, 08, 10, 12 SERIES)
100 mm – 1200 mm (4" - 48" dia.)	or permanently marked on the gasket.	STAR	MJGAS (04, 00, 06, 10, 12 SERIES)
Rubber Gaskets for Flanged Joints			
Nitrile Gaskets for special site conditions	ASTM Designation NBR, Generally resistant to hydrocarbons, fats, oils, greases, hydraulic fluids and chemicals.		
Blow-offs	greases, hydraulic huids and chemicals.		
50 mm Valves	50 mm (2") Brass Gate Valve/Ball Valve		
	F.I.P.T x F.I.P.T		
50 mm dia. Blow-off valve	50 mm (2") Galvanized Pipe 1.5 M (5 ') long M.I.P.T x M.I.P.T		
50 mm dia. Cap	50 mm (2") Galvanized Cap F.I.P.T		
50 mm diameter bend	50 mm (2") Galvanized 45 <sup>0</sup> or 90° elbow F.I.P.T/ F.I.P.T		
50 mm Nipples	50 mm (2") brass or galvanized nipples x 150 mm (6") long		
Cathodic Protection	(		
5.4 Kg (12 Lbs) Zinc	Packaged to meet ASTM B418-73 Type 11	MAPLE AGENCIES	ADZBP12
	Purity Standards Including #10-7 Strand 5' Copper Wire with Jacket	INTERPROVINCIAL CORROSION CONTROL	ICCC: 12S14ZP
		BTI	ZA-12
10.9 Kg (24 Lbs) Zinc	Packaged to meet ASTM B418-73 Type 11 Purity Standards Including #8 Solid Copper Wire with Jacket –	INTERPROVINCIAL CORROSION CONTROL	24SI-4ZP
	5'	CORROSION	2448
		MAPLE AGENCIES	SP-24
		COREXCO	Cor Z-24
		BTI	ZA-24
14.5 Kg (32 lbs)	High Potential Magnesium Supplied with 3 m.	INTERPROVINCIAL	32D5GG – 32lb
Magnesium Anode	10 AWG Copper Wire TWU 75', 600 V Black Coated Jacket	CORROSION CONTROL	
		BTI	MA-32
Petroleum Tape Systems	Anti-corrosion wrap shall consist of Denso paste or Denso priming Solution(cold Temp), Denso Profiling Mastic and Denso LT Tape	Denso North America Inc.	Denso North America Inc
Sac Caps	Benee Freining Maetie and Benee Er Tape		
12 mm – 19 mm	Zinc Caps	INTERPROVINCIAL	
(1/2" – ¾" dia.)	1/2" UNC	CORROSION	
· · · · ·	5/8" UNC ¾" UNC	CONTROL	
Cadweld Powder Cartridge	Cadweld Connections	ERICO PRODUCTS	
Cathodic Protection Test Stations	Flush Mount	PRO-MARK	PM-TS5
Insulation			
Rigid Foam 600 mm x 2400 mm x 50	Expanded, Extruded Polystyrene Boards. Min. R 10 and Blue in colour	DOW CHEMICAL	HI 40
mm	ASTM C578 Type VI or IV UL Classified	CELFORTEC INC.	Formula R-400
Insulated Pipe 25 mm – 600 mm (1" – 24" dia.)	Factory applied Polyurethane Foam	URECON	Refer to Manufacturer's Spec.
Tracer Wire and Appurtenan	ices		•
Tracer Wire	#12 AWG high-strength copper clad steel insulated with a 30 mil,	COPPERHEAD	1230Blue-SF Open Cut only 1245Blue-EHS Directional Drill
	high density polyethylene insulation, blue in colour	PROTRACE	HF-CCD-PE30 Open Cut Only HDD-CCS-PE45 Directional Drill
		DRYCONN	Direct Bury Waterproof Connectors
Insulating Mastic Tape		PLYMOUTH BISHOP	#10 Polyseal
Curb Boxes			
		<b>BIBBY/TYLER/UNION</b>	VSB1 19 mm – 25 mm (3/4 " – 1")
Curb Service Box	1.35 m - 1.65 m (4.5' - 5.5' ) Deep Marked "water"	STE. CROIX	VSB1 19 mm $= 25 \text{ mm} (3/4) = 1$ VSB2 37 mm $= 50 \text{ mm} (1 \frac{1}{2}) = 2^{\circ}$

Arch Base Type         Arch Base Type         Arch Base Type         Arch Base Type           Staintess steet road for curb box if more carb box if mor			ſ	
Stantess steel rou for cum service box with an wide x 6.5 mm thick (1* x ½)         BibBYTT-LERAINION Stantess Steel Color PM           Stantess Steel Color PM         304 Stantess steel Same Dox Repair Cover Marked * water 37° set Same Dox Repair Cover Marked * water 37° set Dox Cost fron to ASTM-A48 or ASTM-A536 Drilled for tracer wire Type)         BibBYTSE CROIX BibBYTSE CROIX STAR         VB650           Lower Section         OFSS 1850 Cost fron to ASTM-A48 or ASTM-A536 Drilled for tracer wire Type)         BibBYTSE CROIX BibBYTSE CROIX STAR         VB650           Valve Box Base         OFSS 1850 Cost fron to ASTM-A48 or ASTM-A536 Drilled for tracer wire Cost fron to ASTM-A48 or ASTM-A536         BibBYTSE CROIX BibBYTSE CROIX STAR         VB500 Drilled for tracer wire DoxCAST           Valve Box Base         OFSS 1850 Cast fron to ASTM-A48 or ASTM-A536         BibBYTSE CROIX BibBYTSE CROIX STAR         VB-607 Drilled STAR           Valve Box Base         OFSS 1850 Cast fron to ASTM-A48 or ASTM-A536         BibBYTSE CROIX STAR         VB-607 Drilled STAR           Valve Box Base         OFSS 1850 Cast fron to ASTM-A48 or ASTM-A536         BibBYTSE CROIX STAR         VB-607 Drilled STAR           Valve Cater */ UNC x4 4 ½?         AWWA-C110 High Strength, Corten (low alov */ UNC A4 ½?         BibBYTSE CROIX         VB502 STAR         Balt Ar40           */ UNC Cater Nuta Water Sevice Matheds		Arch Base Type	50110107	A-728 37 mm – 50 mm ( 1 ½" – 2")
service box         800 mm (38') Long Top of the rod Starves Box Repair Cover         STE_CRO(X DOMCAST           Stainless Steel Colter Pin         304 Stainless steel         Muetier         185           Service Box Repair Cover         Marked "valier" 378" set Service Dox Repair Cover         Muetier         185           Valve Box Set Upper Section         Cast Ion to ASTM-A48 or ASTM-A536 Diffed for tracer wire 130 mm (5 %') diak X700 mm (28' Screw Type)         BIBBY/STE_CRO1K         V9650           Lower Section         Oct Ion to ASTM-A48 or ASTM-A536 000 mm (5 %') diak X700 mm (28' Screw Type)         BIBBY/STE_CRO1K         V96500           Lower Section         Oct Ion to ASTM-A48 or ASTM-A536 000 mm (5 %') diak X700 mm (28' Screw Type)         BIBBY/STE_CRO1K         V96500           Ion Cover         OP55 1850         BIBBY/STE_CRO1K         V96205         Cast Ion to ASTM-A48 or ASTM-A536           Valve Box Base         OP55 1850         BIBBY/STE_CRO1K         V96300         Cast Ion to ASTM-A48 or ASTM-A536           Valve Box Base         OP55 1850         Cast Ion to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           Valve Cast Astron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES         Cast Ion to ASTM-A48 or ASTM-A536           Valve Cast Astron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES         Cast Ion to ASTM-A48 or ASTM-A536	<u></u>			DF9007
Shaped 25 mm Wide x 6.5 mm thick (1* x'/x)         MUELER           Stainless Steel Cotter Pr         304 Stainless steel         OMAGST           Service Box Repair Cover         Mittreadwater 30° set Service Box Repair Cover         Mueller         165           Valve Boxes         Open Section         Difference         Difference         Difference           Upper Section         Cast non to ASTM-A48 or ASTM-A536 Difference         BiBB YISTE CROIX         VBe500           Cast non to ASTM-A48 or ASTM-A536 DOMCAST         DF89 SERIES         VB-5007           Cast non to ASTM-A48 or ASTM-A536 DOMCAST         DOMCAST         DF89 SERIES           Cast non to ASTM-A48 or ASTM-A536 DOMCAST         DF89 SERIES         DE800           Valve Box Base         OPS8 1850 Cast non to ASTM-A48 or ASTM-A536         DOMCAST         DF89 SERIES           Extensions         S00 mm (12) Long OPS8 1850 Cast non to ASTM-A48 or ASTM-A536         BIBBY/STE CROIX         VB-5007           T-odds with nuts         AWWA-C110 High Strength. Corten (low alloy 3FTAR         VB-502, VB-				
Stainless Steel Cotter Pin         304 Stainless steel         DOMCAST           Service Box Repair Cover         Marked "valer" 3/8" ret Service Box Repair Cover         165           Valve Boxs         OPSS 1850 Cast Iton to ASTM-A48 or ASTM-A536 Cast Iton to ASTM-A48 or ASTM-A536 B00 mm (54") dia. X 700 mm (28" screw Type)         BIBBY/STE. CROIX         VB650           Lower Section         OPSS 1850 Cast Iton to ASTM-A48 or ASTM-A536 B00 mm (24")         BIBBY/STE. CROIX         VB550           Lower Section         OPSS 1850 Cast Iton to ASTM-A48 or ASTM-A536 B00 mm (24")         BIBBY/STE. CROIX         VB550           Valve Box Base         OPSS 1850 Cast Iton to ASTM-A48 or ASTM-A536         BIBBY/STE. CROIX         VB550           Valve Box Base         OPSS 1850 Cast Iton to ASTM-A48 or ASTM-A536         BIBBY/STE. CROIX         VB500           Valve Box Base         OPSS 1850 Cast Iton to ASTM-A48 or ASTM-A536         BIBBY/STE. CROIX         VB500           Strat         VB-5002         VB502         Strat         VB-5023, VB-5024, VB-5025, VB-5024, VB-5025, VB-5024, VB-5025, VB-5024, VB-5025, VB-5024, VB-5025, VB-5023, VB-5024, VB-5025, VB-5024, VB-5025, VB-5024, VB-5025, VB-5024, VB-5025, VB-5023, VB-5024, VB-5025, VB-5024, VB-5024, VB-5024, VB-5025, VB-5024, VB-5025, VB-5024, VB-5024, VB-502	service box			-
Starlines Steel Cotter Pin         304 Starlines steel         Image: Service Box Repair Cover         Marked Vater 3's' set Service Box Repair Cover         Steel Serve - Unhreaded 1' ppe           Upper Section         OPSS 1850         Cast Inot to STM-A48 or ASTM-A536 Driled for tracer wire 150 mm (5 X') dax. X'00 mm (28' Screw         BIBBY/STE_CROIX         VB650           Lower Section         Cast Inot to STM-A48 or ASTM-A536 600 mm (2 X')         BIBBY/STE_CROIX         VB500           I cover Section         Cast Inot to ASTM-A48 or ASTM-A536 600 mm (2 X')         BIBBY/STE_CROIX         VB500           Valve Box Base         OPSS 1850         BIBBY/STE_CROIX         VB500         Cast Inot to ASTM-A48 or ASTM-A536           Valve Box Base         OPSS 1850         Cast Inot to ASTM-A48 or ASTM-A536         BIBBY/STE_CROIX         VB500           Valve Box Base         OPSS 1850         Cast Inot to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           Valve Cast         OPSS 1850         Cast Inot to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           Valve Cast         OPSS 1850         Cast Inot to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           Valve Cast         OPSS 1850         Cast Inot to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           VUNC X 4* Anit rotatotals         VWWA-C110 High Strengh, Corten (l		Shaped 25 mm white x 6.5 mm thick ( 1 x <sup>7</sup> / <sub>4</sub> )		-
Service Box Repair Cover         Marked "valer" 38" set service Post - Unthreaded 1" pipe         Mueller         165           Valve Boxes         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536 Diffed for trace-wire 'Type]         BIBBY/STE. CROIX         VB650           Lower Section         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBBY/STE. CROIX         VB650           Lower Section         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBBY/STE. CROIX         VB550           Valve Box Base         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE. CROIX         VB550           Valve Box Base         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE. CROIX         VB500           Valve Box Base         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE. CROIX         VB5023, VB-5024, VB-5025           Valve Box Base         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DP69 SERIES           Tbolts with nuts         MWWA-C110 High Strength. Corten (row alloy STAR         VB 5023, VB-5024, VB-5025         DOMCAST           VINC X 4' 'V UNC	Stainlaga Staal Cattor Din	204 Stainlaga ataal	DOMCAST	
Screw – Unthreaded 1* pipe         View Boxes           Upper Section         OPSS 1850 Direl of or tracer wire 100 mm (5 ½*) dia. X 700 mm (28*) Screw Tipe         BIBBY/STE_CROIX         VB650           Lower Section         OSI font 0.ASTM.A48 or ASTM.A536 Dolled for tracer wire 100         BIBBY/STE_CROIX         VB500           Lower Section         Osat from 0.ASTM.A48 or ASTM.A536 600 mm (24*)         BIBBY/STE_CROIX         VB500           Iron Cover         OPSS 1850 Cast from to ASTM.A48 or ASTM.A536         BIBBY/STE_CROIX         VB825           Valve Box Base         OPSS 1850 Cast from to ASTM.A48 or ASTM.A536         BIBBY/STE_CROIX         VB826           Valve Box Base         OPSS 1850 Cast from to ASTM.A48 or ASTM.A536         BIBBY/STE_CROIX         VB826           T-botts with nuts         AWWA.C10 Ing OPSS 1650         BIBBY/STE_CROIX         VB826           Y UNC X 4*         AWWA.C10 High Strength, Corten (low alloy astel), min yield strength of 45, 000 psi         STAR         VB-023, VB-5024, VB-5025           Y'UNC X 4* Anii Rotatornal         AWWA.C10 High Strength, Corten (low alloy 3'/ UNC Cata Anii Rotatornal         AWWA.C10         Bit CS40, CS45           Y'UNC X 4* Anii Rotatornal         AWWA.C200         STAR         Bott CS40, CS45           Y'UNC X 4* Anii Rotatornal         AWWA.C200         STAR         Bott CS40, CS45           Y'UNC X 4* An			NA	405
Valve Boxe         OPSS 1850         OPSS 1850         BIBBY/STE_CROIX         VB650           Lower Section         OPSS 1850         BIBBY/STE_CROIX         VB650           Lower Section         OPSS 1850         BIBBY/STE_CROIX         VB650           Iton Cover         OPSS 1850         BIBBY/STE_CROIX         VB550           Valve Box Base         OPSS 1860         BIBBY/STE_CROIX         VB550           Valve Box Base         OPSS 1860         BIBBY/STE_CROIX         VB550           Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE_CROIX         VB550           OpSS 1850         Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         VB5507           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF98 SERIES         DOMCAST           OPSS 1850         Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE_CROIX         VB5007           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF98 SERIES         DOMCAST           Star A         VB-S007         BIBBY/STE_CROIX         VB750         DOMCAST           Yolk X 4/Y         Star N         BIBBY/STE_CROIX         VB750         DOMCAST           Yolk X 4/Y         AWWA-C101 High Strength. Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bot C540, C545	Service Box Repair Cover		Mueller	165
Upper Section         OPSS 1850 (130 mm (5 ½) dia, XT0 mm (28' Screw Type)         BiBEV/STE_CROIX         VB650 STAR         VB650 VB550           Lower Section         OPSS 1850 Creat Iron to ASTM-A48 or ASTM-A536 600 mm (24')         DOMCAST         DF69 SERIES           Iron Cover         OPSS 1850 Creat Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBEV/STE_CROIX         VB550           Valve Box Base         OPSS 1850 Creat Iron to ASTM-A48 or ASTM-A536         BIBEV/STE_CROIX         VB520           Valve Box Base         OPSS 1850 Creat Iron to ASTM-A48 or ASTM-A536         BIBEV/STE_CROIX         VB5007           Valve Box Base         OPSS 1850 Creat Iron to ASTM-A48 or ASTM-A536         BIBEV/STE_CROIX         VB5007           Extensions         300 mm (12') Long OPSS 1850         BIBEV/STE_CROIX         VB500           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           7-bots with nulb         AVWA-C101 Big Strength. Corten (low alloy SCIAR         BIBEV         FMC2337, FMC2112           30 OFS 1850 Creat Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           30 OFS 1850 Creat Iron to ASTM-A48 or ASTM-A536         DOMCAST         VB6023(VB-5024, VB-5024, VB-5025           31 Traced Ast or AsTM-A48 or ASTM-A536         DOMCAST         VB602(SCR)         DF69 SERIES           7-bots with nulb         AVWA-C	Value Bayes	Screw – Unthreaded T pipe		
Cast Iron to ASTM-A48 or ASTM-A536 DIIEd for tracer wire 130 mm (5 %) dia. X 700 mm (28' Screw Type)         STAR         VB-6007           Lower Section         Cast Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBBY/STE_CROIX         WB500           Iron Cover         OPSS 1850         STAR         VB-000 VBD/HD           Iron Cover         OPSS 1850         BIBBY/STE_CROIX         VB200           Valve Box Base         OPSS 1850         BIBBY/STE_CROIX         VB200           Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE_CROIX         VB200           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF99 SERIES           Valve Box Base         OPSS 1850         BIBBY/STE_CROIX         VB300           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF99 SERIES           300 mm (12') Long OPS 1850         OPSS 1850         BIBBY/STE_CROIX         VB300           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF99 SERIES         DOMCAST           7' UNC X 4''         Star         VB-500 / P59 1850         BIBBY/STE_CROIX         VB300           Yulv UNC Avainzed         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bit CS40, CS45           Y' UNC CX 4' X''         Strent Steel, Materials         Strent Strent Materials		0000 1050		VPCEO
Dilled for tracer wire 130 mm (5 ½) dia. X100 mm (28' Screw Type)         STAR         V=0-007 bits           Lower Section         OFSS 1850 Cast Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBEVISTE_CROIX         VB550           Iron Cover         Cast Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBEVISTE_CROIX         VB255           Iron Cover         OFSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBEVISTE_CROIX         VB255           Valve Box Base         OPSS 1850 ODMCAST         BIBEVISTE_CROIX         VB255           Extensions         300 mm (12') Long OPSS 1850         BIBEVISTE_CROIX         VB900           Cast Iron to ASTM-A48 or ASTM-A536         BIBEVISTE_CROIX         VB900           Fasteners         300 mm (12') Long OPSS 1850         BIBEVISTE_CROIX         VB900           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           7-botts with nuts         Start R         VB-0007         BIBEV           7-botts with nuts         AWWA-C110 High Strength, Corten (tow alloy Start R         STAR         Bott CS40, CS45           %' UNC X 4* Anit Rotational AUT breaded Rod         AWWA-C100 High Strength, Corten (tow alloy Start Berley, Mark 1997         STAR         Bott CS40, CS45           %' UNC Carten Nuts         AWWA-C800 Ball type and Non-draining Intel/Outlet Compression Joints for CTS         CAMBRIDGE BRA	Opper Section			
Type)         Def         Def         Strike           Lower Section         OPSS 1850         Def         Def         Strike           Lower Section         OPSS 1850         BIBS/VSTE_CRUX         V8500         Strike           Iron Cover         OPSS 1850         BIBS/VSTE_CRUX         V8500         V8500           Valve Box Base         Cast Iron to ASTM-A48 or ASTM-A536         BIBS/VSTE_CRUX         V8500         DOMCAST         DF69 SERIES           Valve Box Base         OPSS 1850         Cast Iron to ASTM-A48 or ASTM-A536         BIBS/VSTE_CRUX         V8500         DOMCAST         DF69 SERIES           Strike         Strike         V8500         Strike         V8500         DOMCAST         DF69 SERIES           Strike         OPSS 1850         Cast Iron to ASTM-A48 or ASTM-A536         Strike         V8500         DOMCAST         DF69 SERIES           Festemers         T-botis with nuts         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         Strike         Str			STAR	VB-5007
Lower Section         Type)         BIBBY/STE_CROIX         VB550           Lower Section         0.95S 1850         STAR         VB006 VBDHD         DOMCAST         DF60 SERIES           Iron Cover         Cast Iron to ASTM-A48 or ASTM-A536         BIBBY/STE_CROIX         VB250         DOMCAST         DF60 SERIES           Valve Box Base         OPSS 1850         BIBBY/STE_CROIX         VB250         DOMCAST         DF60 SERIES           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF60 SERIES         DOMCAST         DF60 SERIES           Extensions         300 mm (12) Long OPSS 1850         DF60 SERIES         DOMCAST         DF60 SERIES           Festeners			DOMCAST	DF69 SERIES
Lower Section         CPSS 1850 600 mm (24')         BIBB/VSTE_CROIX         VE500           Iron Cover         CPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536 600 mm (24')         BIBB/VSTE_CROIX         VE500           Valve Box Base         CPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBB/VSTE_CROIX         VE500           Valve Box Base         CPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBB/VSTE_CROIX         VE5007           Extensions         300 mm 1/2' Long CPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBB/VSTE_CROIX         VE5007           Fabtoms         300 mm 1/2' Long CPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBB/VSTE_CROIX         VE500.           Fabtoms         AWWA-C10 High Strength. Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         VE5023, VB-5024, VB-5025           %' UNC X 4' Arti Y' UNC X 4' Arti Rotatonal AT threated Rod         AWWA-C10 High Strength. Corten (low alloy STAR         BIB/STE_CROIX         VB-602           %' UNC Gationabed Plated AT Threated Rod         AWWA-C10 High Strength. Corten (low alloy STAR         STAR         Bol CS40, CS45           %' UNC Gationabed Plate AT Threated Rod         AWWA-C800         STAR         Bol CS40, CS45           SULC Corter Nuls         AWWA-C800         CAMBRIDGE         202ML-4444.25 mm (1') 202ML-4474.42 Ant 25 mm (1') 202ML-4474.75 G mm (2)           Main Stop				
Cast Iron to ASTM-A48 or ASTM-A536         STAR         VP-006 VBDHD           Iron Cover         Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           Valve Box Base         OPSS 1850         BIBB/VSTE_CRXIX         VB250           Cast Iron to ASTM-A48 or ASTM-A536         BIBB/VSTE_CRXIX         VB260           DOMCAST         DF69 SERIES         DOMCAST         DF69 SERIES           Cast Iron to ASTM-A48 or ASTM-A536         BIBB/VSTE_CRXIX         VB5007           DOMCAST         DF69 SERIES         DOMCAST         DF69 SERIES           Star         QPSS 1850         BIBB/VSTE_CRXIX         VB5007           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           DOMCAST         DF69 SERIES         DOMCAST         DF69 SERIES           T-botts with nuts         AWWA-C110 High Strength, Corten (low alloy 'X' UNC X 4' 'A''         SIGMA         DMC237_FMC2112           'Y' UNC X 4' 'A''         SIGMA         Bott CS40, CS45         SIGMA           'Y' UNC X 4' Arti Rotational 'Y' UNC X 4'Art Rotational AI Threaded Rod         AWWA-C800         SIGMA         DMC240_CS260_CS45           Sigma Artific A struct Arti	Lower Section		BIBBY/STE CROIX	VB550
600 mm (24*)         DOMCAST         DF69 SERIES           Iron Cover         OPSS 1850         STAR         VB5007           Valve Box Base         OPSS 1850         STAR         VB 5007           Cast Iron to ASTM-A48 or ASTM-A536         STAR         VB 5007           Cast Iron to ASTM-A48 or ASTM-A536         DDMCAST         DP69 SERIES           300 mm (12*) Long OPS 1850         DOMCAST         VB 5007           Cast Iron to ASTM-A48 or ASTM-A536         DDMCAST         VB 5007           T-bolts with nuts         300 mm (12*) Long OPS 1850         DMCAST         VB 5007           Zast Iron to ASTM-A48 or ASTM-A536         DDMCAST         VB 5007           T-bolts with nuts         AWWA-C110 High Strength, Corten (low alloy stee), min yield strength of 45, 000 psi         STAR         VB-5023, VB-5024, VB-5025           Y' UNC x 4* // ''' UNC x 4* // '''' UNC x 4* // '''' UNC x 4* // '''''''''''''''''''''''''''''''''''				
Iron Cover         OPS5 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBBYSTE CROIX VB:0007         VB:2507           Valve Box Base         OPS5 1850 Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF09 SERIES           STAR         VB:5007         VB:5007           Cast Iron to ASTM-A48 or ASTM-A536         STAR         VB:5007           DOMCAST         DF09 SERIES         DIMCAGT           Star         VB:5007         VB:5007           OPS 1850         STAR         VB:5007           Cast Iron to ASTM-A48 or ASTM-A536         STAR         VB:5007           T-botis with nuts         STAR         VB:5007           *Z' UNC x4*         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         BIBBY STE CROIX           *Z' UNC x4*         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Boit CS40, CS45           *Z' UNC Galvanized Plated All Threaded Rod         AWWA-C800         STAR         Boit AR40           *Z' UNC Corten Nuts         Water Service Materials         202NL-C472 S mm (1*) 202NL-C475 9 mm (2*) 202NL-C475 9 mm (2*) 202NL-C477 9 mm (2*)           Main Stop         AWWA-C800 Bail type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS 301NL-ARC63 7 mm (1 ½*) 201NL-ARC63 7 mm (1 ½*) 201NL-ARC63 7 mm (1				
Cast Iron to ASTM-A48 or ASTM-A536         STAR         VB-5007           Valve Box Base         OPSS 1850         Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           Extensions         30 mm (12') Long OPSS 1850         DBIBDY/STE_CROIX         VB:5007           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           BIBDY/STE_CROIX         VB:5007           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         DF69 SERIES           BIBDY/STE_CROIX         VB:5007         DOMCAST         DF69 SERIES           Fasteners         Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         PF602337, FMC2112           */* UNC X 4*         Stard         BIBBY/STE_CROIX         VB:5002         DOMCAST           */* UNC X 4* 3*/*         Stard         BIBBY/STE_CROIX         PF02337, FMC2112         Stard           */* UNC X 4* 3*/*         Stard         BIBBY         FMC2337, FMC2112         Stard           */* UNC X 4* 3*/*         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt AR40         Stard           */* UNC X 4* ANT         AWWA-C800         Ball Type, Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-H4H 42 Stmm (1)         202NL-H4H 42 Stmm (1)         202NL-GCG 37 m	Iron Cover			
Valve Box Base         OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST STAR         DF09 SERES           Extensions         300 mm (12') Long OPSS 1850         STAR         VB-5007           Cast Iron to ASTM-A48 or ASTM-A536         STAR         VB-5007           DOMCAST         DF09 SERES         DOMCAST           Zast Iron to ASTM-A48 or ASTM-A536         STAR         VB-5023, VB-5024, VB-5025           Fasteners         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY STE, CROIX         VB-5023, VB-5024, VB-5025           Y' UNC x 4"         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY STE         FMC2337, FMC2112           Y'' UNC X 4" Anti Rotational T'' Bolk R Nut         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Boit CS40, CS45           Y'' UNC Galvanized Plated All Threaded Rod         STAR         Boit AR40         STAR           Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-H4H4 25 mm (1') 202NL-C4C4 Copper flare 25 mm (1') 202NL-C4C3 25 mm (1') 202NL-C4C4 26 mm (2') 202NL-C4C4 26 mm (2') 202NL-C4C3 25 mm (1') 202NL-C4C3 25 mm (1') 202NL-AG63 37 mm (1 ½') 202NL-AG7 50 mm (2') 202NL-AG7 50 mm (2') 202NL-AG7 50 mm (2') 202NL-AG7 50 mm (2') 202NL-AG7 50 mm (2') 203NL-AG7 50 mm (2') 203NL-	ITON COVER			
Value Box Base         OPSS 1850         BIBBY/STE_CR01X         V9900           Cast fron to ASTM-A48 or ASTM-A536         BIBBY/STE_CR01X         V9900           Extensions         300 mm (127) Long OPSS 1850         DOMCAST         DF69 SERIES           T-bolts with nuts         AWWA-C110 High Strength, Corten (iow alloy 3'C UNC x 4''         STAR         VB-5023, VB-5024, VB-5024, VB-5026           Z'' UNC X 4''         AWWA-C110 High Strength, Corten (iow alloy 3'C UNC x 4' x''         FMC2337, FMC2112         INGERSOL FASTNER           ''' UNC X 4''         steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           ''' UNC X 4''         steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           ''' UNC CArainized Plated All Threaded Rod X'' UNC Carten Nuts         AWWA-C10 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           ''' UNC Carten Nuts         AWWA-C800 Ball Type and Non-draining Intel/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-HH4 25 mm (1') 202NL-HH7H7 To mm (1 /2') 202NL-HH7H7 To mm (1 /2') 202NL-HH7H7 To mm (1 /2') 202NL-H7H7 To mm (1 /2') 202N				
Cast Iron to ASTM-A48 or ASTM-A536         STAR         VE-5007           Extensions         300 mm (12") Long OPS 81800         DOMCAST         DF69 SERIES           Cast Iron to ASTM-A48 or ASTM-A536         DOMCAST         VB-5023, VB-5024, VB-5025           T-botis with nuts         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           %" UNC x 4"         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           %" UNC x 4"         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           %" UNC Carlvanized Plated AI Threaded Rod         STAR         Bolt AR40         STAR           %" UNC Carlvanized Plated Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-F4H4 25 mm (1") 202NL-64C 20per flare 25 mm (1) 202NL-64C 20per flare 25 mm (1) 202NL-64C 20per flare 25 mm (1) 202NL-64C 20per flare 25 mm (1") 202NL-64C 20per flare 25 mm (1") 202NL-64C 202Per flare 25 mm (1") 202NL-64C 202NL-747 75 mm (2")           Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS 301NL-A4C56 37 mm (1") 301NL-A6EG 37 mm (1") 301NL-A4C56 37 mm (1") 301NL-A4C5 37 mm (1") 301NL-A4H1 31 mm (34") 118NL+H414 31 mm (34") 118NL+H414 31	Valvo Box Baso	OPSS 1850		
Extensions         DOMCAST         Dré9 SERIES           300 mm (12") Long OPSS 1850 Cast iron to ASTM-A48 or ASTM-A536         BIBBY/STE CROIX         VB-5023, VB-5024, VB-5024, VB-5025           Fasteners         T-botis with nuts         AWWA-C110 High Strength, Corten (low alloy 3tell), min yield strength of 45, 000 psi         FMC2337, FMC2112           %' UNC x 4"         Stell, min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           %' UNC x 4 ½"         Stell, min yield strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           %' UNC X 4"         Stell, min yield strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bot CS40, CS45           %' UNC Galvanized Plated All Threaded Rod         STAR         Bot CS40, CS45         Stell           %' UNC Catre Nuts         Mater Service Materials         Z02NL-H4H4 25 mm (1*) 202NL-6C61 7 mm (1 1/2*) 202NL-6C61 7 mm (1 1/2*) 202NL-6C62 7 mm (1*) 202NL-6C62 7 mm (1*) 202NL-6C62 7 mm (1*) 202NL-6C63 7 mm (1*) 301NL-A626 3 7 mm (1 *) 301NL-A626 3 7 mm (1	valve box base			
Extensions         300 mm (12°) Long OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         BIBEVYSTE_CROIX         VB:5023, VB:5024, VB:5024           Fastemers         WWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           ½" UNC x 4"         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           "X" UNC x 4" Anti Rotational "T" Bolk Nut         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           "X" UNC Catvanized Plated All Threaded Rod         STAR         Bolt CS40, CS45         STAR           Water Service Materials         AWWA-C800 Ball Type and Non-draining Intel/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-H4H4 25 mm (1") 202NL-C424 Capper fare 25 mm (1") 202NL-V474 75 0 mm (2") 202NL-C474 75 0 mm (2"		Cast II UII LU AS TIVI-A40 UI AS TIVI-A330		
OPSS 1850 Cast Iron to ASTM-A48 or ASTM-A536         STAR         VB-5023, VB-5024, VB-5025           Fasteners         VB-5023, VB-5024, VB-5024, VB-5025         DOMCAST           7.* UNC x 4*         AWWA-C110 High Strength, Corten (low alloy 3/* UNC x 4*/a         FMC2337, FMC2112           7.* UNC x 4*         INGERSOL, FASTNER         SELCO           7.* UNC x 4*/a         SELCO         SELCO           7.* UNC x 4*/a         Bolt RAU         STAR         Bolt CS40, CS45           7.* UNC x 4* Anti Rotational         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           7.* UNC converted Materials         STAR         Bolt CS40, CS45         STAR           7.* UNC converted Materials         Bolt Threaded Rod         STAR         Bolt CS40, CS45           7.* UNC converted Materials         AWWA-C800         CAMBRIDGE         202NL-C4C4 Copper flare 25 mm (1*)           8 all Type and Non-draining Inlet/Outlet Compression Joints for CTS         MUELLER         B2209N         202NL-C4C6 37 mm (1 1/2')           202NL-C4C6 To B mm (2')         202NL-C4C6 37 mm (1 1/2')         202NL-C4C6 37 mm (1')         202NL-C4C6 37 mm (1')           8 all Type, finite male AWWA-C800         Start Best Best Best Best Best Best Best Bes	Extensions	200 mm (12") Long		
Cast Iron to ASTM-A48 or ASTM-A536     DOMCAST     DOMCAST       Fasteners     AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi     BIBBY     FMC2337, FMC2112       ½" UNC x 4"     MWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi     BIBBY     FMC2337, FMC2112       ½" UNC x 4" Anti Rotational     AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi     STAR     Bolt CS40, CS45       "" UNC Galvanized Plated All Threaded Rod     STAR     Bolt CS40, CS45     STAR       "" UNC Corten Nuts     Star Bolt CS40, CS45     STAR     Bolt CS40, CS45       "" UNC Corten Nuts     STAR     Bolt RA40     STAR       Water Service Materials     Corten Nuts     Star (Star Corten Nuts)     Star (Star Corten Nuts)       Water Service Materials     AWWA-C800     CAMBRIDGE     202NL-H4H4 25 mm (1")       Q2NL-LC7C7 50 mm (2')     202NL-GC63 37 mm (1 1/2')     202NL-GC76 50 mm (2')       Wain Stop     AWWA-C800     CAMBRIDGE BRASS     301NL-A6H6 37 mm (1 1/2')       Main Stop     AWWA-C800     CAMBRIDGE BRASS     301NL-A6H6 37 mm (1 1/2')       Mult LLER     ES209N     S01NL-AAH7 50 mm (2')     301NL-A6H6 37 mm (1 1/2')       Compression joint for CTS     CAMBRIDGE BRASS     301NL-A6H6 37 mm (1 1/2')       Stoware Corter Nuts     Star Stor M (1') <td< td=""><td></td><td></td><td></td><td></td></td<>				
Fasteners     AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45,000 psi     BIBBY     FMC2337, FMC2112       */* UNC x 4*     Steel), min yield strength of 45,000 psi     INGERSOL FASTNER     SELCO       */* UNC x 4* Anti Rotational */* UNC x 4* Anti Rotational */* UNC corten Nuts     AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45,000 psi     STAR     Bolt CS40, CS45       */* UNC x 4* Anti Rotational */* UNC Gavanized Plated All Threaded Rod */* UNC Corten Nuts     AWWA-C800 Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS     CAMBRIDGE     202NL-H4H4 25 mm (1*) 202NL-C6C6 37 mm (1 1/2*) 202NL-C6C6 37 mm (1 1/2*) 202NL-C4C4 Copper flare 25 mm (1*) 202NL-C4C4 25 mm (1*) 301NL-A6B6 37 mm (1 1/2*) 301NL-A6B6 37 mm (1 1/2*) 301NL-A7B7 50 mm (2*) 301NL-A7B7 50 mm (1*) 118NL-H414 45 mm (34*) 112NL-YYY 50 mm (1*) 12NL-YYY 50 mm (12*) 301NL-A7D7 50 mm (1*) 12NL-YYY 50 mm (12*) 301NL-A7D7 50 mm (1*) 12NL-YYY 50 mm (12*) 301NL-A7D7 50 mm (1*) 301NL-A7D7 50				VB-5023, VB-5024, VB-5025
T-bolts with nuts         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         BIBBY         FMC2337, FMC2112           ½" UNC x 4"         INGERSOL FASTNER         INGERSOL FASTNER         INGERSOL FASTNER           ½" UNC x 4"         SELCO         SIGMA         SELCO           ½" UNC x 4" Anti Rotational         AWWA-C110 High Strength, Corten (low alloy "T Bd R Nut         STAR         Bolt CS40, CS45           ½" UNC Galvanized Plated All Threaded Rod         STAR         Bolt AR40         STAR           ½" UNC Corten Nuts         AWWA-C800 Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-44H4 25 mm (1*) 202NL-46H6 37 mm (1 1/2*) 202NL-47C7 50 mm (2*)           Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS 301NL-AAC4 25 mm (1*) 301NL-A6H6 37 mm (1 ½*) 301NL-A6H6 37 mm (1 ½*) 301NL-A6H6 37 mm (1 ½*) 301NL-A6H6 37 mm (1 ½*) 301NL-A6H6 37 mm (1 ½*) 301NL-A7H7 50 mm (2*)           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS 118NL-1414 25 mm (1*) 118NL-1414 25 mm (1*) 120NL-VV7 50 mm (2*)	-	Cast Iron to ASTM-A46 of ASTM-A556	DOMCAST	
Steel), min yield strength of 45, 000 psi     INGERSOL FASTNER       3/* UNC x 4 '/*'     Stell, min yield strength of 45, 000 psi     StellOM       3/* UNC x 4 '/*'     AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi     STAR     Bolt CS40, CS45       3/* UNC x 4 'Anti Rotational "V UNC x 4'/*'     AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi     STAR     Bolt CS40, CS45       3/* UNC Corten Nuts     Water Service Materials     UNC x 4'/*'     Bolt AR40       Curb Stops     AWWA-C800     CAMBRIDGE     202NL-44H4 25 mm (1')       Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS     CAMBRIDGE     202NL-46H6 37 mm (1 1/2')       202NL-47H7 50 mm (2')     202NL-47H7 50 mm (2')     202NL-46H6 37 mm (1 1/2')       202NL-47H7 50 mm (2')     202NL-46H6 37 mm (1 1/2')     202NL-46H6 37 mm (1 1/2')       Main Stop     AWWA-C800     FORD     B-44-444-0-NL 25 mm (1')       Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS     CAMBRIDGE BRASS     301NL-A7C7 50 mm (1 2')       MUELLER     B25008N     PGRD     FB100-7-Q-NL 50 mm (1')       FB100-7-Q-NL 50 mm (2')     FB100-7-Q-NL 50 mm (2')       Compression Coupling     Inlet/outlet compression for CTS     CAMBRIDGE BRASS     118NL-14H41 25 mm (1')       FB100-7-Q-NL 50 mm (2')     FB100-7-Q-NL 50 mm (1')     118NL-14H41 25 mm (1'		AVANALA CAAO Lizzh Otrag ath, Cantag (lavy allav	BIBBY	
%* UNC x 4"         SELCO           %* UNC x 4"         SIGMA           %* UNC x 4" Anti Rotational         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           %* UNC davanized Plated All Threaded Rod %* UNC Corten Nuts         STAR         Bolt AR40           %* UNC Corten Nuts          202NL-44H4 25 mm (1")           Water Service Materials          202NL-46H6 37 mm (1 1/2")           Curb Stops         AWWA-C800 Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-44H4 25 mm (1")           202NL-4066 37 mm (1 1/2")         202NL-44H4 -25 mm (1")         202NL-44H4 -25 mm (1")           202NL-4066 37 mm (1 1/2")         202NL-44H4 -25 mm (1")         202NL-44H4 -25 mm (1")           Main Stop         AWWA-C800 Ball type, Iniet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS         301NL-A4C4 25 mm (1")           301NL-AAC63 37 mm (1 ½")         301NL-AAC63 37 mm (1 ½")         301NL-AAC63 37 mm (1 ½")           Ball type, Iniet male AWWA Taper Thread/Outlet compression for CTS         CAMBRIDGE BRASS         301NL-AAC63 37 mm (1 ½")           Gotton-AWUA -25 0 mm (2")         301NL-AAC64 32 mm (1")         301NL-AAC64 32 mm (1")           118NL-14H4 425 mm (1")         118NL-14H4 425 mm (1")         118NL-14H4 425 mm (1")	I-doits with nuts			FMC2337, FMC2112
½" UNC x 4 ½"         SIGMA           2%" UNC x 4 "Anti Rotational T" Bolt & Nut         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt CS40, CS45           3%" UNC Stavanized Plated All Threaded Rod         AWWA-C800         Bolt Croten Nuts         Descent Plated           Water Service Materials         Curb Stops         AWWA-C800 Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-H4H4 25 mm (1") 202NL-C4C4 Copper flare 25 mm (1)/2 202NL-H7H7 50 mm (2") 202NL-H7H7 50 mm (2") 202NL-GE66 37 mm (1 ½") 202NL-C4C4 Copper flare 25 mm (1") 202NL-GE66 37 mm (1 ½") 202NL-GE6 37 mm (1 ½") 202NL-A7C7 50 mm (2")           Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS 301NL-A4C4 25 mm (1") 301NL-A4C4 25 mm (1") 301NL-A7C7 50 mm (2") 301NL-A7C7 50	2/11/11/00 /11	steel), min yield strength of 45, 000 psi		
STAR         Bott CS40, CS45           "2" UNC x 4" Anti Rotational T" Bolt & Nut         AWWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45, 000 psi         STAR         Bolt AR40           "3" UNC Galvanized Plated All Threaded Rod         AWWA-C300         Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-H4H4 25 mm (1") 202NL-C64C3 Copper flare 25 mm (1") 202NL-C64C3 Tom (1 1/2") 202NL-C64C3 Tom (1 1/2") 202NL-C67C5 TO mm (2")           Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS 301NL-A64C6 37 mm (1 1/2") 202NL-C76T 50 mm (2")           Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression for CTS         CAMBRIDGE BRASS 301NL-A64C6 37 mm (1 ½") 301NL-A76T 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS 202NL-C77 S0 mm (2")           MUELLER         B25209N         301NL-A64C6 37 mm (1 ½") 301NL-A64C6 37 mm (1 ½") 301NL-A76T 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS 202NL-C77 S0 mm (2")           MUELLER         B25008N         FORD         FB1000-4-NL 25 mm (1") FB1000-4-NL 25 mm (1") FB1000-4-	3⁄4″ UNC x 4″			
3/2" UNC x4" Anti Rotational x4WWA-C110 High Strength, Corten (low alloy steel), min yield strength of 45,000 psi       STAR       Bolt AR40         3/2" UNC Galvanized Plated All Threaded Rod	3⁄4" UNC x 4 1⁄2"			
"T" Bolt & Nut         steel), min yield strength of 45, 000 psi           %" UNC Galvanized Plated All Threaded Rod All Threaded Rod				
3/* UNC Galvanized Plated All Threaded Rod          Water Service Materials          Curb Stops       AWWA-C800 Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS       CAMBRIDGE       202NL-H4H4 25 mm (1") 202NL-C4C4 Copper flare 25 mm (1") 202NL-C4C4 Copper flare 25 mm (1") 202NL-C4C6 37 mm (1 1/2") 202NL-C4C6 37 mm (1 1/2") 202NL-C4C4 Copper flare 25 mm (1") B44+560-Q-NL 37 mm (1 1/2") B44+560-Q-NL 37 mm (1 1/2") B44+560-Q-NL 37 mm (1 1/2") 301NL-A4C6 37 mm (1 1/2") 301NL-A4C6 37 mm (1 1/2") 301NL-A4C6 37 mm (1 1/2") 301NL-A7H7 50 mm (2") MUELLER         Main Stop       AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS       CAMBRIDGE BRASS 301NL-A7H7 50 mm (2") 301NL-A6C6 37 mm (1 1/2") 301NL-A7H7 50 mm (2") 301NL-A7H7 50 mm (2") 301			STAR	Bolt AR40
All Threaded Rod            %" UNC Corten Nuts            Water Service Materials         202NL-14H4 25 mm (1")           Curb Stops         AWWA-C800           Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE           Multication         202NL-14H4 25 mm (1")           202NL-16H6 37 mm (1 1/2")         202NL-16H6 37 mm (1 1/2")           202NL-17H7 50 mm (2")         202NL-17H7 50 mm (2")           202NL-17H7 50 mm (2")         202NL-14H4 25 mm (1")           202NL-17H7 50 mm (2")         202NL-14H4 25 mm (1")           Main Stop         AWWA-C800           Ball type,         Inlet male AWWA Taper Thread/Outlet           compression joint for CTS         CAMBRIDGE BRASS           MUELLER         82509N           Ball type,         301NL-AAC6 37 mm (1 ½")           Inlet male AWWA Taper Thread/Outlet         301NL-AAC6 37 mm (1 ½")           Ommerssion joint for CTS         CAMBRIDGE BRASS           MUELLER         82509N           Ford         FB100-4-0-NL 25 mm (1")           301NL-AAC6 37 mm (1 ½")         301NL-AAH4 37 mm (1 ½")           301NL-AAH5 31 19 mm (34")         118NL-H31 319 mm (34")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS		steel), min yield strength of 45, 000 psi		
½" UNC Corten Nuts         Mater Service Materials           Water Service Materials         AWWA-C800 Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-44H4 25 mm (1") 202NL-4646 37 mm (1 1/2") 202NL-C6C6 37 mm (1 1/2") 202NL-C7C7 50 mm (2") 202NL-C7C7 50 mm (1") 202NL-A7C7 50 mm (2") 202NL-C7C7 50 mm (2") 202NL-V4V4 25 mm (1") 202NL-V4V4 25 mm (1				
Water Service Materials         AWWA-C800         CAMBRIDGE         202NL-H4H4 25 mm (1")           Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-4646 37 mm (1 1/2")           202NL-H4H4 25 mm (1")         202NL-4646 37 mm (1 1/2")         202NL-4646 37 mm (1 1/2")           202NL-H6H6 37 mm (1 1/2")         202NL-4646 37 mm (1 1/2")         202NL-4646 37 mm (1 1/2")           202NL-H7H7 50 mm (2")         202NL-H7H7 50 mm (2")         202NL-47H7 50 mm (2")           Muence         B444-444-Q-NL 25 mm (1")         B-44-4566-Q-NL 37 mm (1 1/2")           Main Stop         AWWA-C800         CAMBRIDGE BRASS         301NL-A404 25 mm (1")           Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS         301NL-A666 37 mm (1 1/2")           301NL-A6C6 63 7 mm (1 1/2")         301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")           301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           FB100-6-Q-NL 37 mm (1 1/2")         FB100-7-Q-NL 50 mm (2")         118NL-H4H4 25 mm (1")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           120NL-V3V4 42 50 mm (1") <td></td> <td></td> <td></td> <td></td>				
Curb Stops         AWWA-C800 Bail Type and Non-draining Inlet/Outlet Compression Joints for CTS         CAMBRIDGE         202NL-H4H4 25 mm (1") 202NL-C4C4 Copper flare 25 mm (1") 202NL-C4C4 Copper flare 25 mm (1") 202NL-C6C6 37 mm (1 1/2") 202NL-C7C7 50 mm (2") 202NL-C7C7 50 mm (2")           Main Stop         AWWA-C800 Bail type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         MUELLER EA44-777-Q-NL 50 mm (1") B-444-777-Q-NL 50 mm (1") B-44-777-Q-NL 50 mm (1")           Muex Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS MUELLER FORD         301NL-AAC4 25 mm (1") B-44-777-Q-NL 50 mm (2") B-44-777-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS CAMBRIDGE BRASS         301NL-AAC4 25 mm (1") B-44-777-Q-NL 25 mm (1")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         301NL-ACC 75 0 mm (2") B-44-777-Q-NL 25 mm (1")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H2 5 mm (1") FB100-6-Q-NL 37 mm (1 ½") FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H2 5 mm (1") FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H2 5 mm (1") FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118N				
Ball Type and Non-draining Inlet/Outlet Compression Joints for CTS         202NL-C4C4 Copper flare 25 mm (1") 202NL-C6C6 37 mm (1 1/2") 202NL-C6C6 37 mm (1 1/2") 202NL-C6C6 37 mm (1 1/2") 202NL-C7C7 50 mm (2")           Mueller         B5209N           FORD         B-44-444-Q-NL 25 mm (1") B-44-566-Q-NL 37 mm (1 ½") B-44-566-Q-NL 37 mm (1 ½") B-44-566-Q-NL 37 mm (1 ½") B-44-77-Q-NL 50 mm (2")           Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS 301NL-A6C6 37 mm (1 ½") 301NL-A7H7 50 mm (2")           MUELLER         B2509N           Compression Coupling         Inlet/outlet compression for CTS           CAMBRIDGE BRASS         Inlet/out				
Inlet/Outlet Compression Joints for CTS         202NL-H6H6 37 mm (1 1/2")           202NL-H7H7 50 mm (2")         202NL-H7H7 50 mm (2")           202NL-H7H7 50 mm (2")         202NL-H7H7 50 mm (2")           202NL-H7H7 50 mm (2")         202NL-H7H7 50 mm (2")           MUELLER         B25209N           FORD         B-44-444-Q-NL 25 mm (1")           B-44-566-Q-NL 37 mm (1 ½")         B-44-777-Q-NL 50 mm (2")           Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS           MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1")           B25008N         FB100-4-NL 25 mm (1")           FB100-4-NL 25 mm (1")         FB100-4-NL 25 mm (1")           T8NL-H4H4 25 mm (1")         T18NL-H4H3 19 mm (3/4")           T18NL-H4H3 19 mm (3/4")         T18NL-H4H3 19 mm (3/4")           T120NL-V3V3 19 mm (3/4")         T120NL-V4V4 25 mm (1")           T20NL-V4V4 25 mm (1")         T20NL-V7V7 50 mm (2")	Curb Stops		CAMBRIDGE	
Main Stop         AWWA-C800         CAMBRIDGE BRASS         B-44-444-Q-NL 25 mm (1")           Ball type,         Inlet male AWWA Taper Thread/Outlet         CAMBRIDGE BRASS         301NL-A6C6 37 mm (1 ½")           MUELLER         B25209N         B-44-777-Q-NL 50 mm (2")         301NL-A6C6 37 mm (1 ½")           Ball type,         Inlet male AWWA Taper Thread/Outlet         CAMBRIDGE BRASS         301NL-A6C6 37 mm (1 ½")           OMUELLER         B25008N         B-44-777-Q-NL 50 mm (2")         301NL-A6C6 37 mm (1 ½")           Compression joint for CTS         MUELLER         B25008N         B111/2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           120NL-V7V7 50 mm (1")         120NL-V7V7 50 mm (1")         120NL-V7V7 50 mm (1")         120NL-V7V7 50 mm (1")				202NL-C4C4 Copper flare 25 mm (1")
Main Stop         AWWA-C800         MUELLER         B25209N           Main Stop         AWWA-C800         B-44-444-Q-NL 25 mm (1")           B-44-566-Q-NL 37 mm (1 ½")         B-44-566-Q-NL 37 mm (1 ½")           B-44-777-Q-NL 50 mm (2")         B-44-777-Q-NL 50 mm (2")           Multiple         301NL-A6H6 37 mm (1 ½")           Ball type,         301NL-A6H6 37 mm (1 ½")           Inlet male AWWA Taper Thread/Outlet         301NL-A6H6 37 mm (1 ½")           Ompression joint for CTS         MUELLER           B25008N         B25008N           FB100-6-Q-NL 37 mm (1 ½")           FB100-7-Q-NL 50 mm (2")           MUELLER         B25008N           FORD         FB100-6-Q-NL 37 mm (1 ½")           FB100-7-Q-NL 50 mm (2")         MUELLER           B25008N         FORD           FB100-6-Q-NL 37 mm (1 ½")           FB100-7-Q-NL 50 mm (2")           MUELLER         B25008N           FORD         FB100-7-Q-NL 50 mm (2")           T18NL-H3H3 19 mm (3/4")         118NL-H3H3 19 mm (3/4")           118NL-H3H3 19 mm (3/4")         118NL-H3H3 19 mm (3/4")           120NL-VGV3 3 19 mm (3/4")         120NL-VGV4 25 mm (1")           120NL-VGV6 37 mm (1 ½")         120NL-VGV6 37 mm (1 ½")				
Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS AWWA-C800         301NL-A4C4 25 mm (1") B-44-777-Q-NL 50 mm (2")           Main Stop         AWWA-C800         CAMBRIDGE BRASS Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         301NL-A4C4 25 mm (1") 301NL-A6H6 37 mm (1 ½")           MUELLER         B25008N         301NL-AAC4 25 mm (1")           Builtype, Inlet/outlet compression for CTS         MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1")         301NL-A7C7 50 mm (2")           MUELLER         B25008N         FB100-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           COMBRIDGE BRASS         118NL-H4H4 25 mm (1")           I18NL-H4H3 19 mm 3/4")         118NL-H4H3 19 mm 3/4")           I18NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           I18NL-H4H3 19 mm (3/4")         1120NL-V4V4 25 mm (1")           I20NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           I20NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")				
Mueller         B25209N           FORD         B-44-444-Q-NL 25 mm (1")           B-44-566-Q-NL 37 mm (1 ½")         B-44-566-Q-NL 37 mm (1 ½")           B-44-777-Q-NL 50 mm (2")         B-44-777-Q-NL 50 mm (1")           Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS         301NL-A4C4 25 mm (1")           MUELLER         B25008N         301NL-A7T7 50 mm (2")         301NL-A7T7 50 mm (2")           MUELLER         B25008N         FORD         FB1000-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-6-Q-NL 37 mm (1 ½")         FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           I18NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           I20NL-V3V3 19 mm (3/4")         120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")				
FORD         B-44-444-Q-NL 25 mm (1")           B-44-566-Q-NL 37 mm (1 ½")         B-44-566-Q-NL 37 mm (1 ½")           B-44-566-Q-NL 37 mm (1 ½")         B-44-70-NL 50 mm (2")           Main Stop         AWWA-C800         CAMBRIDGE BRASS           Ball type,         Inlet male AWWA Taper Thread/Outlet         301NL-A6H6 37 mm (1 ½")           compression joint for CTS         MUELLER         301NL-A7H7 50 mm (2")           MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-6-Q-NL 37 mm (1 ½")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           1120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V7V7 50 mm (2")				
Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS         301NL-A4C4 25 mm (1") 301NL-A4C6 37 mm (1 ½") 301NL-A6C6 37 mm (1 ½") 301NL-A7TH 750 mm (2") 301NL-A7TH 750 mm (2")           MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1") FB100-6-Q-NL 37 mm (1 ½")           Compression Coupling         Inlet/outlet compression for CTS           CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           118NL-H4H3 19 mm (3/4")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")				
Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS         301NL-A4C4 25 mm (1")           301NL-A6C6 37 mm (1 ½")         301NL-A6C6 37 mm (1 ½")         301NL-A7H7 50 mm (2")           301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")           301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")           301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")           MUELLER         B25008N           FORD         FB100-6-Q-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-6-Q-NL 37 mm (1 ½")           T18NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           118NL-H4H3 19 mm x 25 mm         120NL-V4V4 25 mm (3/4")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V6V6 37 mm (1 ½")         120NL-V7V7 50 mm (2")			FORD	
Main Stop         AWWA-C800 Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         CAMBRIDGE BRASS         301NL-A4C4 25 mm (1")           301NL-A6C6 37 mm (1 ½")         301NL-A6C6 37 mm (1 ½")         301NL-A7H7 50 mm (2")           301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (1")         B25008N           FORD         FB1000-4-NL 25 mm (1")         FB100-6-Q-NL 37 mm (1 ½")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")         118NL-H4H3 19 mm (3/4")           Interview         Interview         Interview         Interview         Interview           Interview         Interview         Interview         Interview         Interview           Interview         Interview         Interview         Interview         Interview           Interview         Interview         In				
Ball type, Inlet male AWWA Taper Thread/Outlet compression joint for CTS         301NL-A6H6 37 mm (1 ½")           MUELLER         301NL-A7H7 50 mm (2")           MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1")           FB100-4-NL 25 mm (1")         FB100-4-NL 25 mm (1")           FB100-7-Q-NL 50 mm (2")         FB100-7-Q-NL 50 mm (1")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           118NL-H4H3 19 mm x 25 mm transition         120NL-V3V3 19 mm (3/4")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")				
Inlet male AWWA Taper Thread/Outlet compression joint for CTS         301NL-A6C6 37 mm (1 ½")           MUELLER         301NL-A7H7 50 mm (2")           MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           118NL-H4H4 25 mm (1")         118NL-H3H3 19 mm (3/4")           118NL-H4H3 19 mm x 25 mm         1120NL-V3V3 19 mm (3/4")           120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V7V7 50 mm (2")	Main Stop		CAMBRIDGE BRASS	
compression joint for CTS         301NL-A7H7 50 mm (2")           301NL-A7C7 50 mm (2")         301NL-A7C7 50 mm (2")           MUELLER         B25008N           FORD         FB100-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1½")         FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")				
Interview         Interview <thinterview< th="">         Interview         <thinterview< th="">         Interview         Interview</thinterview<></thinterview<>				
MUELLER         B25008N           FORD         FB1000-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-7-Q-NL 50 mm (2")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS           118NL-H4H4 25 mm (1")         118NL-H4H4 25 mm (1")           118NL-H4H3 19 mm (3/4")         118NL-H4H3 19 mm (3/4")           1120NL-V3V3 19 mm (3/4")         120NL-V3V3 19 mm (3/4")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V6V6 37 mm (1 ½")         120NL-V7V7 50 mm (2")		compression joint for CTS		
FORD         FB1000-4-NL 25 mm (1")           FB100-6-Q-NL 37 mm (1 ½")         FB100-6-Q-NL 37 mm (1 ½")           Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           118NL-H3H3 19 mm (3/4")         118NL-H4H3 19 mm x 25 mm         transition           120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V7 50 mm (2")         120NL-V7V7 50 mm (2")				301NL-A7C7 50 mm (2")
FB100-6-Q-NL 37 mm (1 ½")           FB100-7-Q-NL 50 mm (2")           Compression Coupling           Inlet/outlet compression for CTS           CAMBRIDGE BRASS           118NL-H4H4 25 mm (1")           118NL-H3H3 19 mm (3/4")           118NL-H4H3 19 mm x 25 mm           transition           120NL-V3V3 19 mm (3/4")           120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")           120NL-V6V6 37 mm (1 ½")           120NL-V7V7 50 mm (2")				
FB100-6-Q-NL 37 mm (1 ½")           FB100-7-Q-NL 50 mm (2")           Compression Coupling           Inlet/outlet compression for CTS           CAMBRIDGE BRASS           118NL-H4H4 25 mm (1")           118NL-H3H3 19 mm (3/4")           118NL-H4H3 19 mm x 25 mm           transition           120NL-V3V3 19 mm (3/4")           120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")           120NL-V6V6 37 mm (1 ½")           120NL-V7V7 50 mm (2")			FORD	
Compression Coupling         Inlet/outlet compression for CTS         CAMBRIDGE BRASS         118NL-H4H4 25 mm (1")           118NL-H3H3 19 mm (3/4")         118NL-H4H3 19 mm x 25 mm transition         118NL-H4H3 19 mm x 25 mm transition           120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")           120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")         120NL-V4V4 25 mm (1")				FB100-6-Q-NL 37 mm ( 1 1/2")
118NL-H3H3 19 mm (3/4")         118NL-H4H3 19 mm x 25 mm         transition         120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")         120NL-V6V6 37 mm ( 1 ½")         120NL-V7V7 50 mm ( 2")				
118NL-H3H3 19 mm (3/4")         118NL-H4H3 19 mm x 25 mm         transition         120NL-V3V3 19 mm (3/4")         120NL-V4V4 25 mm (1")         120NL-V6V6 37 mm (1 ½")         120NL-V7V7 50 mm (2")	Compression Coupling	Inlet/outlet compression for CTS	CAMBRIDGE BRASS	118NL-H4H4 25 mm (1")
118NL-H4H3 19 mm x 25 mm transition 120NL-V3V3 19 mm (3/4") 120NL-V4V4 25 mm (1") 120NL-V6V6 37 mm ( 1 ½") 120NL-V7V7 50 mm ( 2")				
transition 120NL-V3V3 19 mm (3/4") 120NL-V4V4 25 mm (1") 120NL-V6V6 37 mm ( 1 ½") 120NL-V7V7 50 mm ( 2")				
120NL-V3V3 19 mm (3/4") 120NL-V4V4 25 mm (1") 120NL-V6V6 37 mm ( 1 ½") 120NL-V7V7 50 mm ( 2")				
120NL-V4V4 25 mm (1") 120NL-V6V6 37 mm ( 1 ½") 120NL-V7V7 50 mm ( 2")				
120NL-V6V6 37 mm ( 1 ½") 120NL-V7V7 50 mm ( 2")				
120NL-V7V7 50 mm ( 2")				
			MUELLED	

		FORD	C44-44-NL 25 mm (1")
			C44-33-NL 19 mm (3/4")
			C44-34-NL 19 mm x 25 mm transition
Transition Couplings		•	·
5/8" XS x 3/4" CTS	Inlet Compression for CTS/Outlet compression	CAMBRIDGE BRASS	Q24-23
Lead x Copper/Plastic Coupling	joints for various pipe size	FORD	CB119NL U2, U3, U4, U5
5/8" XXS x 3/4" CTS	Inlet Compression for CTS/Outlet compression	CAMBRIDGE BRASS	Q34-23
Lead x Copper/Plastic Coupling	joints for various pipe size	FORD	CB119NL U2, U3, U4, U5
3⁄4" XS x 3⁄4" CTS	Inlet Compression for CTS/Outlet compression	CAMBRIDGE BRASS	Q24-33
Lead x Copper/Plastic Coupling	joints for various pipe size	FORD	CB119NL U2, U3, U4, U5
3⁄4" XXS x 3⁄4" CTS	Inlet Compression for CTS/Outlet compression	CAMBRIDGE BRASS	Q34-33
Lead x Copper/Plastic Coupling	joints for various pipe size	FORD	CB119NL U2, U3, U4, U5
1" XXS x 1" CTS	Inlet Compression for CTS/Outlet compression	CAMBRIDGE BRASS	Q34-44
Lead x Copper/Plastic Coupling	joints for various pipe size	FORD	CB119NL U2, U3, U4, U5
Inserts	Stainless steel inserts fluted end for 100	FORD	INSERT-51, 52, 54, 55
19 mm (3/4") – CTS	Compression connection	CAMBRIDGE BRASS	86-3, 86-4, 86-6, 86-7
25 mm (1") – CTS 37 mm (1 ½") –CTS 50 mm (2") – CTS		MUELLER	INSERTS
Meter Pits	Seek Lasalle Water Dept. Approval		
Sample Station		KUPFERLE	Model #88 Eclipse Sampling Station
Miscellaneous			-
Pipe Joint Lubricant	NSF/ANSI 61-2008 AWWA-C111 SEC. 4.4.4 Lubricant to be food grade only		
Casing Spacers	Plastic, polyethylene Town Approval Required	ADVANCED PRODUCTS & SYSTEM	Model SS1 or CI
Casing Rubber End Seals	Synthetic Rubber	LINK SEAL	Thunderline Link Seal
		ADVANCED PRODUCTS & SYSTEM	
		PSI	PSI End Seal
Automatic and Continuous Flusher		KUPFERLE	Eclipse #9800
Hardwood Wedges	Seek Lasalle Water Dept. Approval		
Solid Concrete Bricks/Blocks	Seek Lasalle Water Dept. Approval		