CONSTRUCTION STANDARDS

For

Water Utilities within Subdivisions

and rights of way

Graham County Utilities, Inc.

9 W Center Street

Pima, Arizona 85543

www.gce.coop

The standards listed below include any authorized amendments as issued the proponent. Graham County Utilities may amend any of the above standards by Board Resolution.

A. *Part 600, Uniform Standard Specifications for Public Works Construction, Maricopa Association of Governments (MAG), revised (current edition),* for other public improvements including water, with the following exceptions.

1. Exceptions:
   a. Section 610.10 shall require mega lugs with mechanical joint fittings to be installed on C900 water mains in addition to thrust blocking where necessary as per ADEQ Bulletin 10, Chapter 7, Distribution Systems.
   b. Section 601.4.2 shall be superseded by Standard Detail SD-115

B. Tucson Water Standard Specifications and Details, City of Tucson, (current edition). Only the sections below are adopted and modify any MAG standard as follows:

1. 0210.30301.D, all water lines require #12AWG, Blue, Solid Copper Type UF, 600V (UL) direct bury tracing wire and a 600V gel cap connector at each splice. Pipe marking and detecting tape is required for installation of all potable water mainlines > = 2" in diameter.

2. 1404, Polyvinyl Chloride Pipe

3. 1431, Hydrostatic Pressure testing of water facilities
   - Addition: Backflow prevention device and meter shall be used for testing the lines.

C. STANDARD DETAILS

SD108, Joint Use Trench

SD500, Fire Hydrant Installation;

- Exception: Omit Note #4 No shrink shall be used in lieu of concrete thrust block.
- Addition: Graham County Utilities fire hydrant manufacturer is *Clow Valve Company*.

SD115, Pipe Bedding and Trench Backfill

- Addition: Shading material, all HDPE pipe must be shaded with a minimum of six (6) inches of shading material over and under the pipe and a minimum of two (2) inches of shading material on all sides of the pipe. Pipe must not be installed against a trench wall. A minimum of two (2) inches shall be maintained between the pipe and trench wall to accommodate shading material between pipe and trench wall. All shading must be smooth and free of rocks and be able to sift through a 3/8" screen. There shall be a minimum of 44" of finished cover.

City of Safford Standard Details, 2018 edition:

COS-309; Water Service Notes:
COS-330; Air Release Valve Installation
COS-400; Drain Valve Assembly
COS-1809; Temporary Connection for Testing

Graham County Utilities, Inc. Acceptable Materials List, 2020:

Materials List Specific to Residential Applications. Applications for exceptions to the above shall be submitted to the Graham County Utilities Water Superintendent in writing.

engineering bulletin no. 10

Chapter 7

DISTRIBUTION SYSTEMS

ARIZONA DEPARTMENT OF HEALTH SERVICES

MAY 1978

4. DEPTH OF PIPES. Minimum cover over water pipes is essential to provide a distribution of stress from superimposed loads, and to provide protection from frost action. External stress and required cover due to external loadings (static and dynamic superimposed forces and earthfill) can be determined in accordance with the applicable standards of the American Water Works Association for each kind of pipe, or by other acceptable criteria. In no case shall the depth of cover to the top of pipe be less than 3 feet, unless adequate structural protection is provided and justified by the Engineer. Where frost depths are greater than the above minimum, the cover should be equal to the frost depth, particularly for small lines which may not be flowing continuously.

5. WATER HAMMER. Water hammer is the phenomenon of oscillations in the pressure of water about its normal pressure in a closed conduit, flowing full, that results from too rapid acceleration or retardation of flow. Water hammer may produce momentary pressures greatly in excess of normal static pressures, thus increasing the probability of water main failure. Suitable provisions shall be made to protect the system from water hammer pressures. The occurrence and severity of water hammer can be reduced through the use of slow-closing valves, pressure-release valves, surge tanks, and air chambers.

   Pumps are particularly susceptable to surge damage during rapid shut-off. Pumps shall be protected from dynamic head by a spring loaded check valve or other safety valve.

6. DEAD ENDS. Blowoff valves, fire hydrants, or other suitable means shall be installed at the ends of dead-end mains to allow periodic flushing of the lines. The minimum size of blowoff valves shall be 2" I.D. Primary feeder mains and larger distribution mains shall have a blowoff valve in each valved section which should be installed at low points in the mains where the flushing water can be readily discharged to natural drainage channels. Blowoff valves must be designed so that operation which will result in erosion or destruction of wildlife is not permitted. Special care must be taken to eliminate the possibility of contaminated water entering the distribution system through blowoff valves which have not been tightly closed.

7. THRUST BLOCKING. Thrusts on pipelines with unrestrained joints occur wherever a bend or branch outlet exists. Thrust forces can be large and may cause the movement and rupture of an inadequately anchored distribution main with unrestrained joints. If the lengths of pipe are joined by tension joints, such as welded joints in a steel pipeline and lugged joints in concrete and cast-iron pipelines, other forms of anchorage are not usually required. The determination of whether or not a given section of

pipeline needs thrust blocks or other means of anchorage shall be made by a qualified engineer. All thrust anchorages shall be designed for a safety factor of not less than 1.50 under maximum pressure loading.

D. VALVING

1. SHUTOFF VALVES. Shutoff isolation valves installed in water mains at various locations within the distribution system allow sections of the system to be taken out of service for repairs or maintenance without significantly curtailing service in other areas. Sufficient valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Valves should be located at not more than 500 foot intervals in commercial districts and at not more than one block or 800 foot intervals, whichever is the lesser distance, in other districts. Variations in this spacing may be required for transmission mains, or special applications.

   All mains branching from feeder mains or loops should be valved as closely adjacent to the feeders as practicable so that the branch mains can be taken out of service without interrupting the supply to other locations. At intersections of distribution mains, the number of valves required will normally be one less than the number of radiating mains; the one valve will be omitted from the line which principally supplies flow to the intersection. As far as practicable, shutoff valves should be installed in standardized locations so they can easily be found in emergencies. For large shutoff valves (approximately 30 inch diameter and larger), it may be necessary to surround the valve operator or entire valve with a manhole to allow for repair or replacement. In important installations and for deep pipe cover, pipe entrance access manholes should be provided so that valve internal parts can be serviced.

   Sufficient valves shall be provided to allow shut-off of lines crossing streams, railroads, major highways, and airports. A valve shall also be provided on each hydrant branch.

2. PRESSURE-REDUCING VALVES. Pressure-reducing valves will normally be required in areas of the distribution system which have pressures in excess of 100 pounds per square inch, or local ordinances or plumbing codes may make pressure reductions the responsibility of the customer. The pressure reducing valves may be installed on the mains serving these areas, or on individual service lines. In some cases, it may be necessary for customers to install pressure-reducing valves only on lines to certain plumbing or heating units which are adversely affected by excessive pressures.

NOTES:

1. ALL SERVICE LINES FOR 3/4" AND 1" METERS SHALL BE 1"

2. ALL SERVICE LINES REQUIRE A TRACER WIRE. THE TRACER WIRE SHALL BE #14 AWG SOLID COPPER TYPE UF, 600V (UL) DIRECT BURY AND A 600V GEL CAP CONNECTOR AT EACH SPLICE AND RUN IN A CONTINUOUS LENGTH FROM THE CURB STOP TO THE CORPORATION. THE TRACER WIRE SHALL BE ATTACHED TO THE SERVICE LINE WITH TAPE OR WIRE TIES AT 1' INTERVALS. A MINIMUM OF 6" COILED WIRE SHALL BE LEFT AT THE CURB STOP. POTABLE WATER REQUIRE A BLUE WIRE; RECLAIMED SERVICES REQUIRE PURPLE WIRE.

3. SHADING MATERIAL, ALL SERVICE LINES MUST BE SHADED WITH A MINIMUM OF SIX (6) INCHES OF SHADING MATERIAL OVER AND UNDER THE PIPE AND A MINIMUM OF TWO (2) INCHES OF SHADING MATERIAL ON ALL SIDES OF THE PIPE. PIPE MUST BE INSTALLED AGAINST A TRENCH WALL. A MINIMUM OF TWO (2) INCHES SHALL BE MAINTAINED BETWEEN THE PIPE AND THE TRENCH WALL. ALL
SHADING MUST BE SMOOTH AND FREE OF ROCKS AND BE ABLE TO SIFT THROUGH A 3/8" SCREEN

4. ALL SERVICE TAPS SHALL BE AT A 45° ANGLE AND MUST FACE THE PROPERTY WHERE THE METER IS INSTALLED.

5. TAPS MADE INTO PVC SHALL BE AT LEAST 2' FROM THE SPIGOT END AND 1' FROM THE BOTTOM OF THE BELL. MULTIPLE TAPS WITHIN AN INDIVIDUAL SECTION OF PVC PIPE SHALL NOT BE LOCATED ON THE SAME AXIS. THE MINIMUM OFFSET SHALL BE 5 DEGREES.

6. TAPS MADE INTO DUCTILE IRON SHALL BE A MINIMUM OF 2' FROM THE SPIGOT AND A MINIMUM OF 1' FROM THE BELL. MULTIPLE TAPS MAY BE MADE AS CLOSE TO EACH OTHER AS PRACTICABLE.

7. METER BOX INSTALLATION IN AREAS SUBJECT TO VEHICULAR TRAFFIC SHALL BE AVOIDED. IF METER BOX INSTALLATION IN AN AREA SUBJECT TO VEHICULAR TRAFFIC IS UNAVOIDABLE #1 CEMENT BOX W/STEEL LID OF THE APPROPRIATE SIZE SHALL BE USED.

8. THE TOP OF THE METER BOX SHALL BE SET 1/2 INCH TO 1 INCH ABOVE GRADE, EXCEPT IN CONCRETE SIDEWALKS, DRIVEWAYS, AND PAVED AREAS WHERE THE METER BOX SHALL BE SET FLUSH WITH THE SURROUNDING SURFACE.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	WATER SERVICE NOTES	City of Safford	COS-309
REVISED:				SHEET 1 OF10

NOTES:

9. IF OBSTRUCTION PREVENT THE METER BOX FROM BEING INSTALLED IN ACCORDANCE WITH THIS DETAIL, CITY OF SAFFORD WATER WILL EVALUATE ALTERNATE LOCATIONS ON A CASE BY CASE BASIS.

10. ALL METER BOX INSTALLATIONS WILL INITIALLY HAVE THE PIPE ACCESS HOLES (MOUSE HOLES) BLOCKED WITH SUITABLE MATERIAL SUCH AS CORRUGATED CARDBOARD TO PREVENT DIRT FROM ENTERING THE BOX.

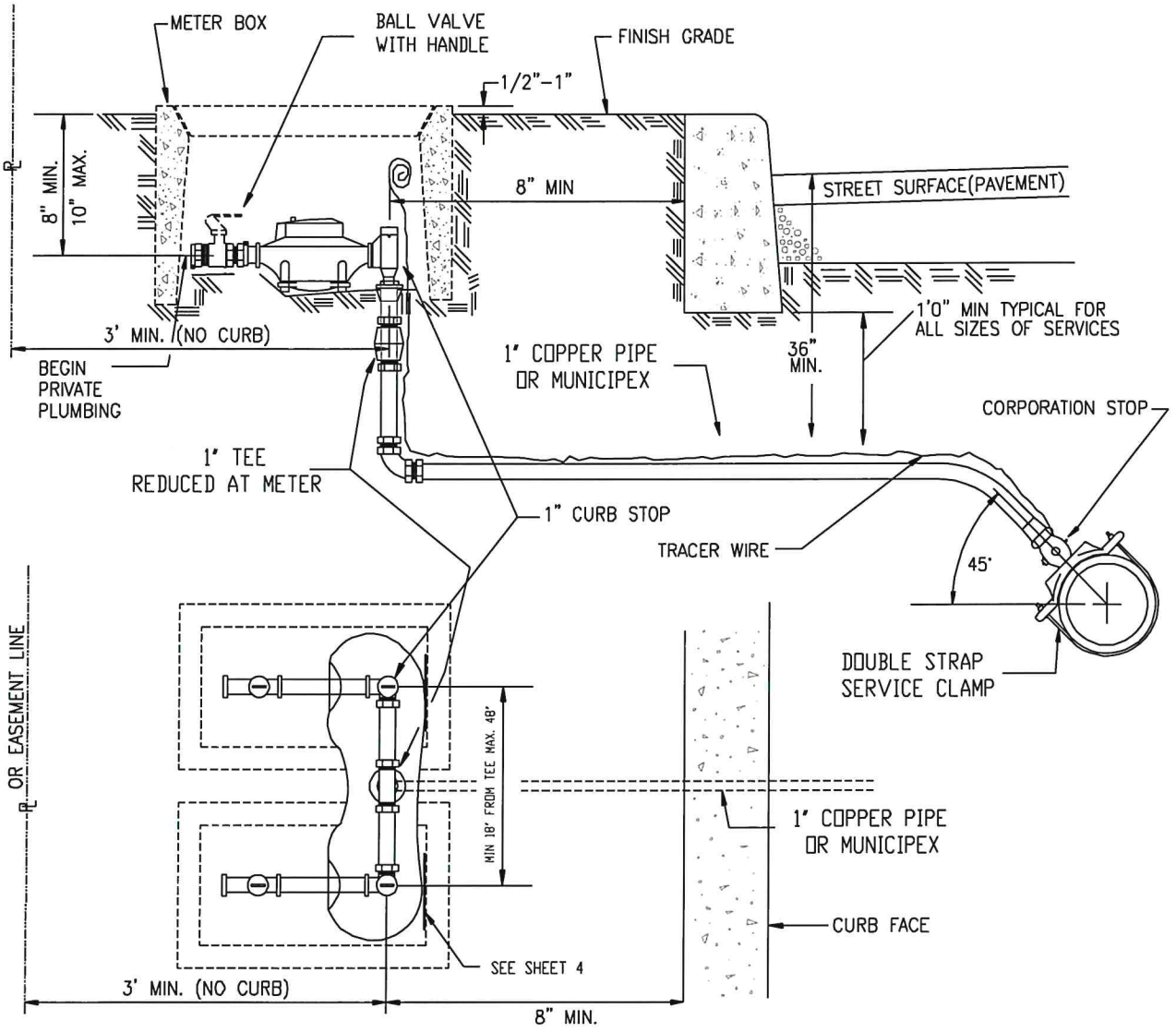
11.

SERVICE LINE DIAMETERS BY LENGTH OF SERVICE LINE*			
	<40'	<40'-100'	>100'
1"	1"	1.5"	1.5"
1.5"	1.5"	2.0"	2.0"
2.0"	2.0"	2.0"	4" MAIN WITH COS APPROVAL

* ONLY REQUIRE UPSIZING OF SERVICE LINE DIAMETER IF PEAK DAY + FIRE FLOW PRESSURE IS <45 PSI

12. WHEN INSTALLING SERVICE LINES, ANY BEND IN THE PIPE 45 DEGREES OR GREATER REQUIRES INSTALLATION OF BRASS ELBOW AT THE BEND.

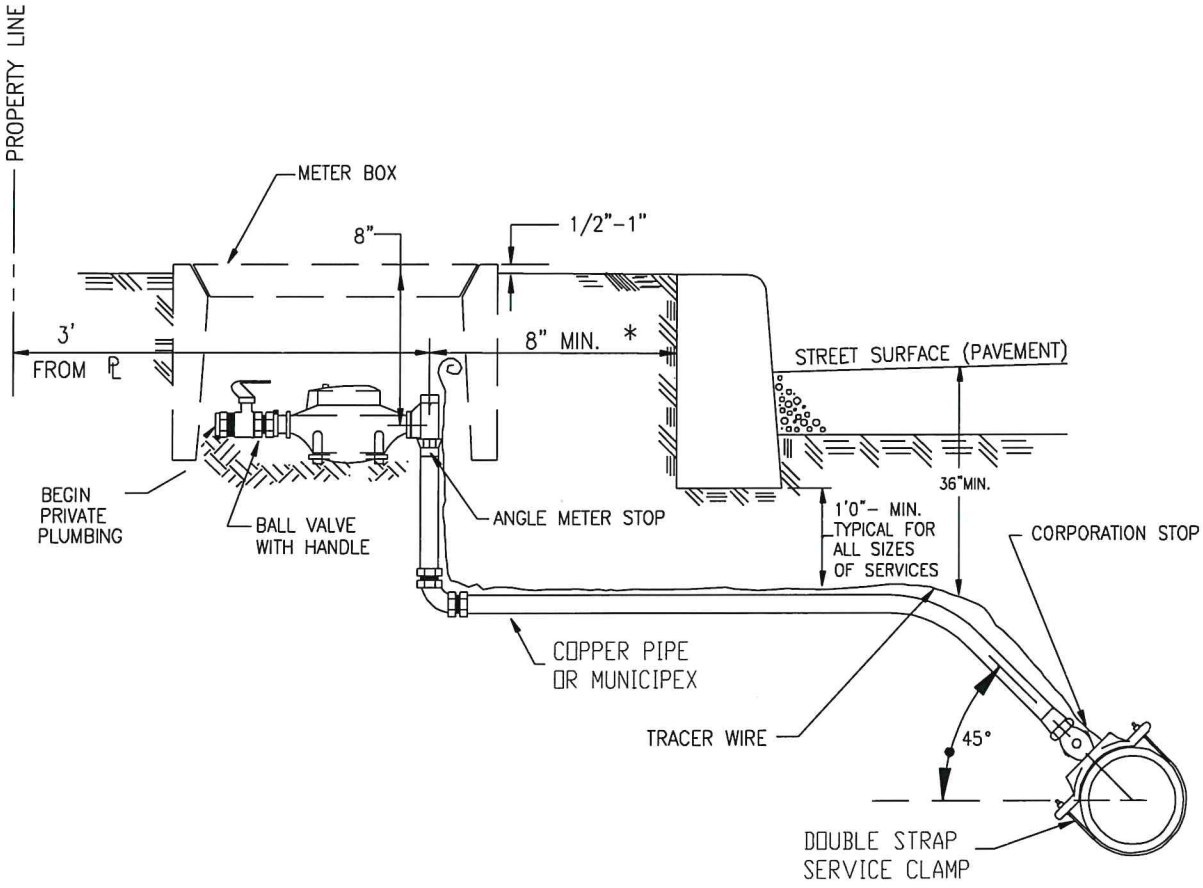
ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	WATER SERVICE NOTES	City of Safford	COS-309
REVISED:				SHEET 2 OF10



NOTES

1. METER BOX SHALL BE SUPPORTED BY TWO 2" X 4" X 12" SOLID CONCRETE BLOCKS INSTALLED UNDER THE LONG AXIS SIDES OF THE BOX
2. PRIVATE PLUMBING MUST BE ADJUSTED TO MATCH NEW METER ELEVATION.
3. IF METER BOX IS LOCATED IN SIDEWALK AREA, THE BOX SHALL BE INSTALLED ADJACENT TO BACK OF CURB
4. FOR D.I.P., REFER TO NOTE 4 COS-309
5. WHEN USING HDPE, A STEEL POST MUST BE USED FOR SUPPORT. ATTACH SERVICE LINE TO POST WITH NYLON ZIP TIE. THE POST MUST BE SUFFICIENT LENGTH TO SUPPORT THE CURB STOP

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	1 INCH SPLIT SERVICE CONNECTIONS	City of Safford	COS-309
REVISED:				3 OF 16



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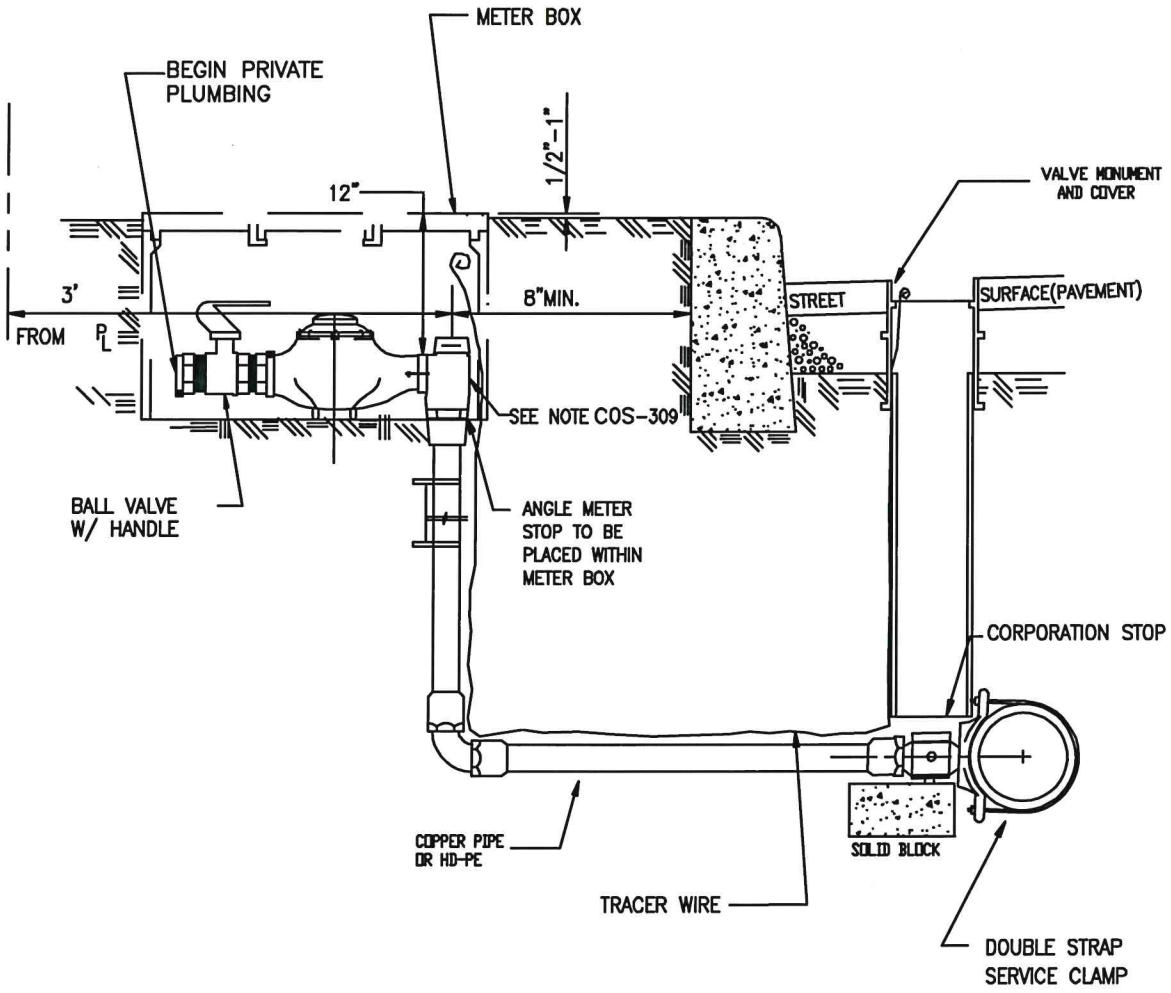
ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	WATER SERVICE CONNECTION	City of Safford	COS-309
REVISED:		1" OR ¾" SINGLE		4 OF 10



NOTES
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3. FOR D.I.P., REFER TO NOTE 4 COS-309
4. WHEN USING HDPE, A STEEL POST MUST BE USED FOR SUPPORT. ATTACH SERVICE LINE TO POST WITH NYLON ZIP TIE. THE POST MUST BE SUFFICIENT LENGTH TO SUPPORT THE CURB STOP

METER SIZE	BOX TYPE	ST. DET. NO.
1 1/2 & 2"	NO. 3	COS-309

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	WATER SERVICE CONNECTION 1 1/2" OR 2" SINGLE	City of Safford	COS-309
REVISED:				5 of 10

NOTES:

DESCRIPTION

THE UNDER THIS ITEM SHALL CONSIST OF FURNISHING ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO ADJUST WATER METER BOXES AT THE LOCATIONS SHOWN IN THE PROJECT PLANS AND IN ACCORDANCE WITH THE REQUIRMENTS OF THESE SPECIAL PROVISIONS.

MATERIALS:

FOR BADLY WORN OR BROKEN WATER METER BOXES AND COVERS, OR FOR WATER METERS NOT HAVING BOXES OR COVERS, THE CONTRACTOR SHALL NOTIFY THE CITY OF SAFFORD FIELD INSPECTOR. THE CONSTRUCTION SECTION REPRESENTATIVE SHALL MAKE ARRANGEMENTS FOR THE CONTRACTOR TO OBTAIN NEW WATER METER BOXES AND COVERS FROM THE WATER DEPARTMENT AT NO EXPENSE TO THE CONTRACTOR. THE CONTRACTOR SHALL PICK UP THE NEW METER BOXES AND COVERS FROM CITY STORES.

CONSTRUCTION REQUIREMENTS:

WHERE EXISTING WATER METER BOXES WILL BE ADJUSTED TO A NEW FINISHED GRADE, THE EXISTING METER BOXES SHALL BE SET IN ACCORDANCE WITH COS-309.

BASIS OF PAYMENT:

THE COST OF ADJUSTING WATER METER BOXES SHALL BE INCIDENTAL TO THE COST OF THE PROJECT.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	ADJUST METER BOX	City of Safford	COS-309
REVISED:				SHEET 6 OF10

NOTES:

1. BORING TO INSTALL SERVICE LINES WILL BE PERMITTED ONLY IF SHOWN ON THE APPROVED PLANS OR WITH THE APPROVAL OF THE ENGINEER.

2. BORE AND RECEIVING PITS SHALL NOT ENCROACH UPON PRIVATE PROPERTY. ANY LANDSCAPING OR IMPROVEMENTS DAMAGED OR MOVED WILL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE ENGINEER.

3. ONLY MACHINES MANUFACTURED FOR BORING WILL BE USED.

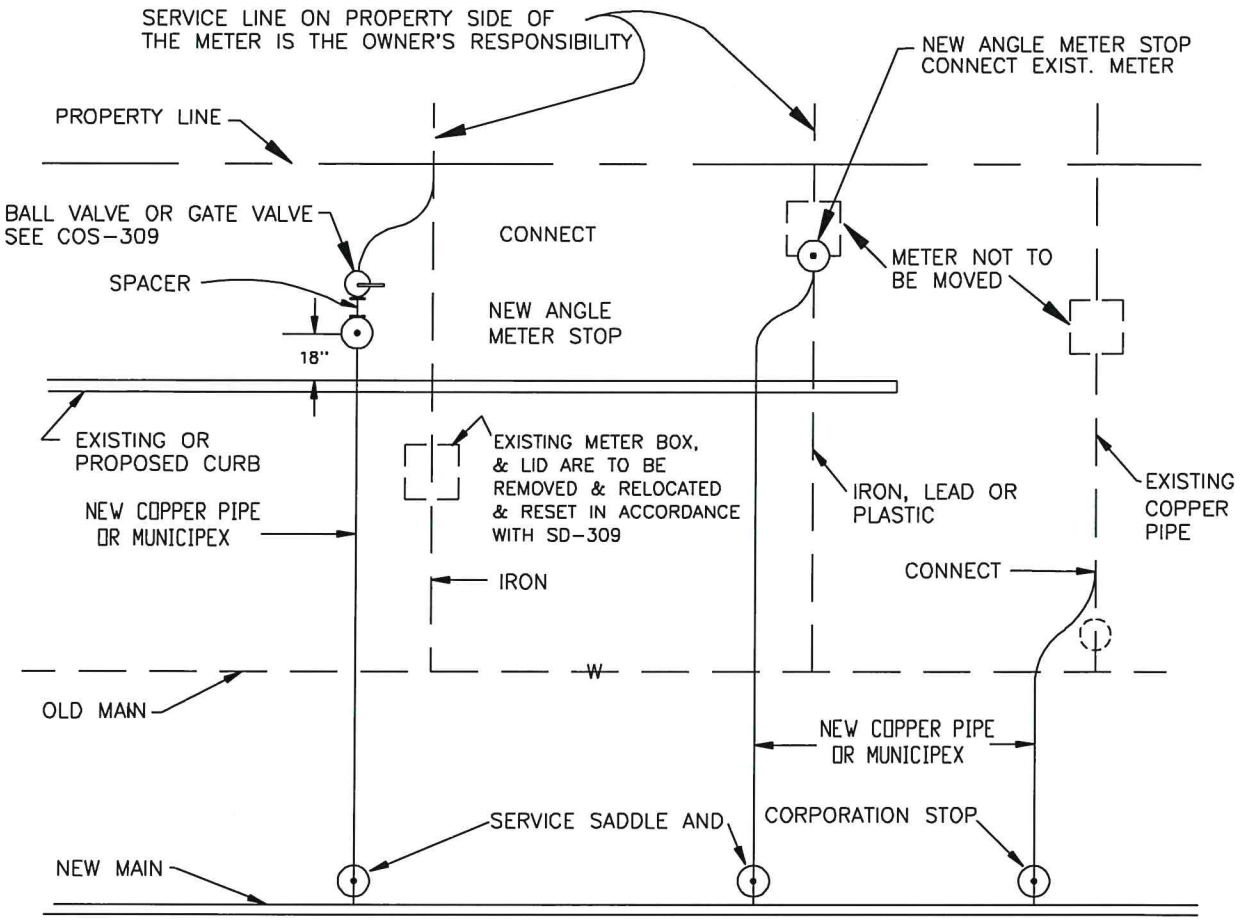
4. DEVIATION FROM A STRAIGHT AND LEVEL BORE MUST FALL WITHIN THE FOLLOWING PARAMETERS TO BE ACCEPTABLE:

   HORIZONTAL: +/− 12 INCHES
   VERTICAL: +/− 6 INCHES

5. ALL BORES SHALL BEGIN AT AN ELEVATION OF 36" BELOW FINISHED GRADE AND AS CLOSE TO THE STATION SHOWN ON THE PLANS AS POSSIBLE. IF NO STATION IS SHOWN FOR AN EXISTING SERVICE TO BE REPLACED, THEN THE BORE SHALL BE AS CLOSE TO PERPENDICULAR AS POSSIBLE.

6. FOR CITY CONTRACTS: WHEN BORING FOR SERVICES IS APPROVED WITHOUT A BID ITEM, THE AMOUNT FOR EACH BORE MUST BE SET AT THE TIME OF APPROVAL. PAYMENTS FOR TRENCHING, BACKFILL, SAW CUTTING, PAVEMENT REPLACEMENT AND CHIP SEALING WILL NOT BE MADE FOR SERVICE LINES AT LOCATIONS WHERE BORING IS DONE IN LIEU OF OPEN CUTTING.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	NOTES FOR BORING SERVICE LINES	City of Safford	C□S-309
REVISED:				SHEET 7 □F10



SERVICE RENEWAL (METER TO BE RELOCATED)

SERVICE RENEWAL (METER NOT RELOCATED)

SERVICE TIE-OVER

TYPICAL SERVICE CONDITIONS

SERVICE RENEWAL
(METER TO BE RELOCATED)

INCLUDES:

- SERVICE SADDLE
- CORPORATION STOP
- TAP
- COPPER, HDPE PIPE, OR MUNICIPEX
- ANGLE METER STOP
- BALL VALVE OR GATE VALVE PER COS-309
- ADAPTER FITTINGS
- CONNECT EXIST. SERVICE LINE
- TRACER WIRE COS-309 NOTE 2

SERVICE RENEWAL
(METER NOT RELOCATED)

INCLUDES:

- SERVICE SADDLE
- CORPORATION STOP
- TAP
- COPPER PIPE (entire length)
- ANGLE METER STOP
- TRACER WIRE COS-309 NOTE 2
- CONNECT EXISTING METER

SERVICE TIE-OVER

INCLUDES:

- SERVICE SADDLE
- CORPORATION STOP
- TAP
- COPPER PIPE (FIRST 5 FEET)
- ADAPTER FITTINGS
- CONNECT EXIST. SERVICE LINE

NOTE
IN ALL CASES THE CONTRACTOR MUST RESET THE METER BOX TO FINAL GRADE IN ACCORDANCE WITH COS-309

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	SERVICE RENEWALS AND TIE-OVERS	City of Safford	COS-309
REVISED:				SHEET 8 OF10

NOTES:

ALL DRILLING OR TAPPING OF ANY WATERMAINS, NEW OR EXISTING, SHALL BE DONE ONLY WITH EQUIPMENT PROVIDED WITH ACTIVE PURGING FACILITIES AS REQUIRED BY THIS SPECIFICATION.

1. NO "DRY" DRILLING OR TAPPING OF WATERMAINS SHALL BE PERMITTED. PRIOR TO ANY DRILLING, THE MAIN TO BE DRILLED SHALL HAVE ALL ENTRAPPED AIR REMOVED AND WATER PRESSURIZED TO 40 P.S.I. OR NORMAL OPERATING SYSTEM PRESSURE, WHICHEVER IS HIGHER.

2. ALL DRILLING MACHINES AND ADAPTORS TO BE USED TO DRILL ANY NEW OR EXISTING MAIN THAT IS OR WILL BECOME A PART OF THE TUCSON WATER DISTRIBUTION SYSTEM SHALL BE MODIFIED AS SHOWN IN STANDARD DETAIL 317 AND APPROVED FOR USE BY THE ENGINEER PRIOR TO THE START OF ANY DRILLING OPERATIONS. DRILLING EQUIPMENT WITHOUT APPROVED PURGING WATER PROVISION SHALL NOT BE UTILIZED.

3. PURGE WATER OPENINGS SHALL BE A MINIMUM OF 3/4" FOR DRILLING HOLES UP TO AND INCLUDING 2" IN DIAMETER AND 1" FOR DRILLING HOLES GREATER THAN 2" IN DIAMETER.

4. THE PURGE OPENING SHALL BE POSITIONED IN THE BOTTOM QUADRANT OF THE EQUIPMENT WHEN THE EQUIPMENT IS POSITIONED ON THE MAIN TO BE DRILLED.

5. NO VALVES SHALL BE PERMITTED IN THE PURGE WATER PATH. WHERE THE CONTRACTOR CHOOSES TO PERFORM AN AIR TEST TO DEMONSTRATE THE INTEGRITY OF THE DRILLING MACHINE POSITIONING PRIOR TO THE START OF DRILLING, THE REQUIRED DRAIN HOSE MAY BE REMOVED FROM THE PURGE WATER NIPPLE AND A PIPE CAP INSTALLED. AT THE COMPLETION OF THE AIR LEAK TEST AND PRIOR TO THE START OF ANY DRILLING THIS PIPE CAP MUST BE REMOVED AND THE DRAIN HOSE REINSTALLED.

6. THE DRAIN HOSE SHALL BE FULL SIZE, 3/4" I.D. OR 1" I.D., AND SHALL NOT EXCEED 50 FEET IN LENGTH.

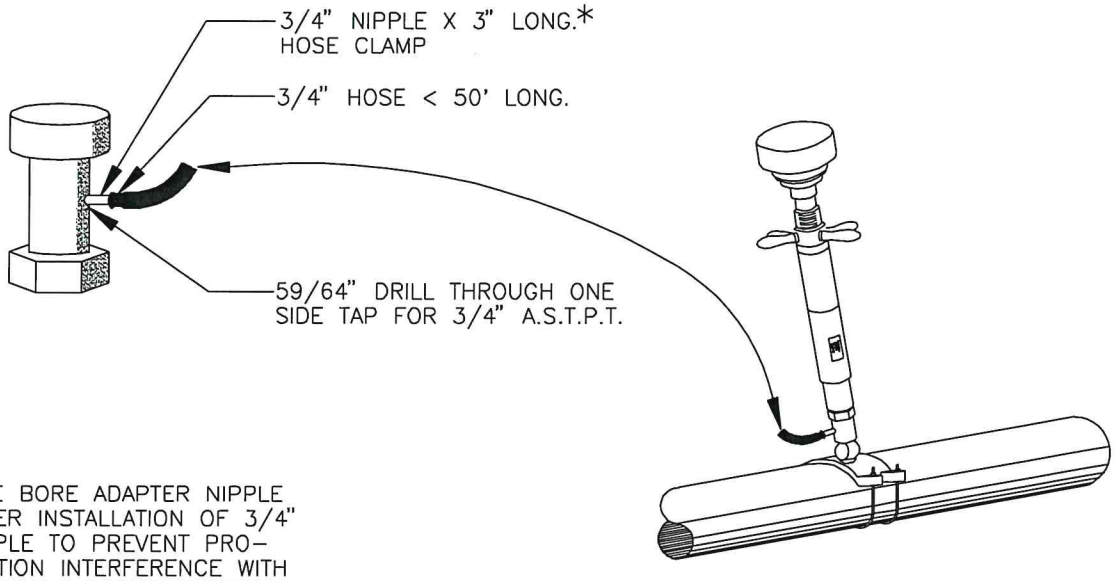
7. DRILLS AND SHELL CUTTERS SHALL BE MAINTAINED SHARP AND OF PROPER DIMENSIONS TO MINIMIZE DAMAGE TO THE PIPE AND TO PRESERVE THE INTEGRITY OF THE REMAINDER OF THE PIPE WALL. DRILLS AND SHELL CUTTERS SHALL PRODUCE CLEAN, EVEN ENTRY CUTS UNDER NORMAL DRILLING MACHINE STRESSES OR THEY SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.

8. ALL PIPE BEDDING AND THRUST BLOCKING SHALL BE IN PLACE AND APPROVED BY THE ENGINEER PRIOR TO THE START OF DRILLING. THRUST AND VALVE SUPPORT BLOCKING SHALL BE IN PLACE FOR ANY TAPPING SLEEVE AND VALVE AND APPROVED BY THE ENGINEER PRIOR TO THE START OF DRILLING.

9. PURGE WATER FLOW SHALL BE CONTAINED UNTIL THE DRILLING MACHINE BORING BAR IS WITHDRAWN AND THE NEW CORPORATION COCK OR TAPPING VALVE CLOSED.

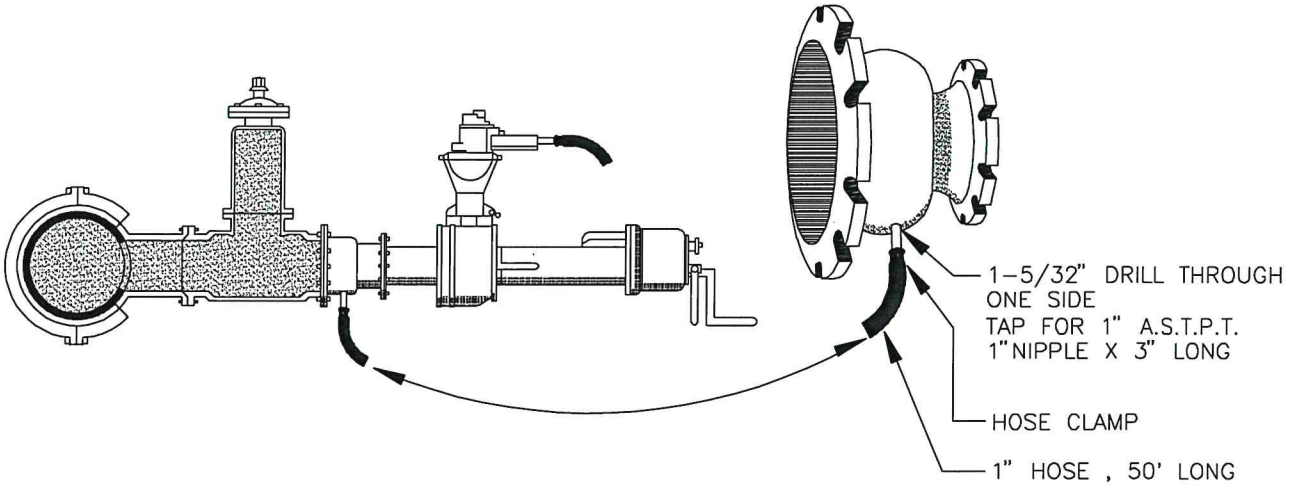
10. PURGE WATER SHALL BE DISPOSED OF IN ADJACENT BACK FILL UNLESS OTHERWISE ALLOWED BY THE ENGINEER.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	NOTES FOR PURGING OF SERVICE LINES	City of Safford	C□S-309
REVISED:				SHEET 9 □F10



*LINE BORE ADAPTER NIPPLE AFTER INSTALLATION OF 3/4" NIPPLE TO PREVENT PROJECTION INTERFERENCE WITH DRILLING MACHINE BORING BAR.

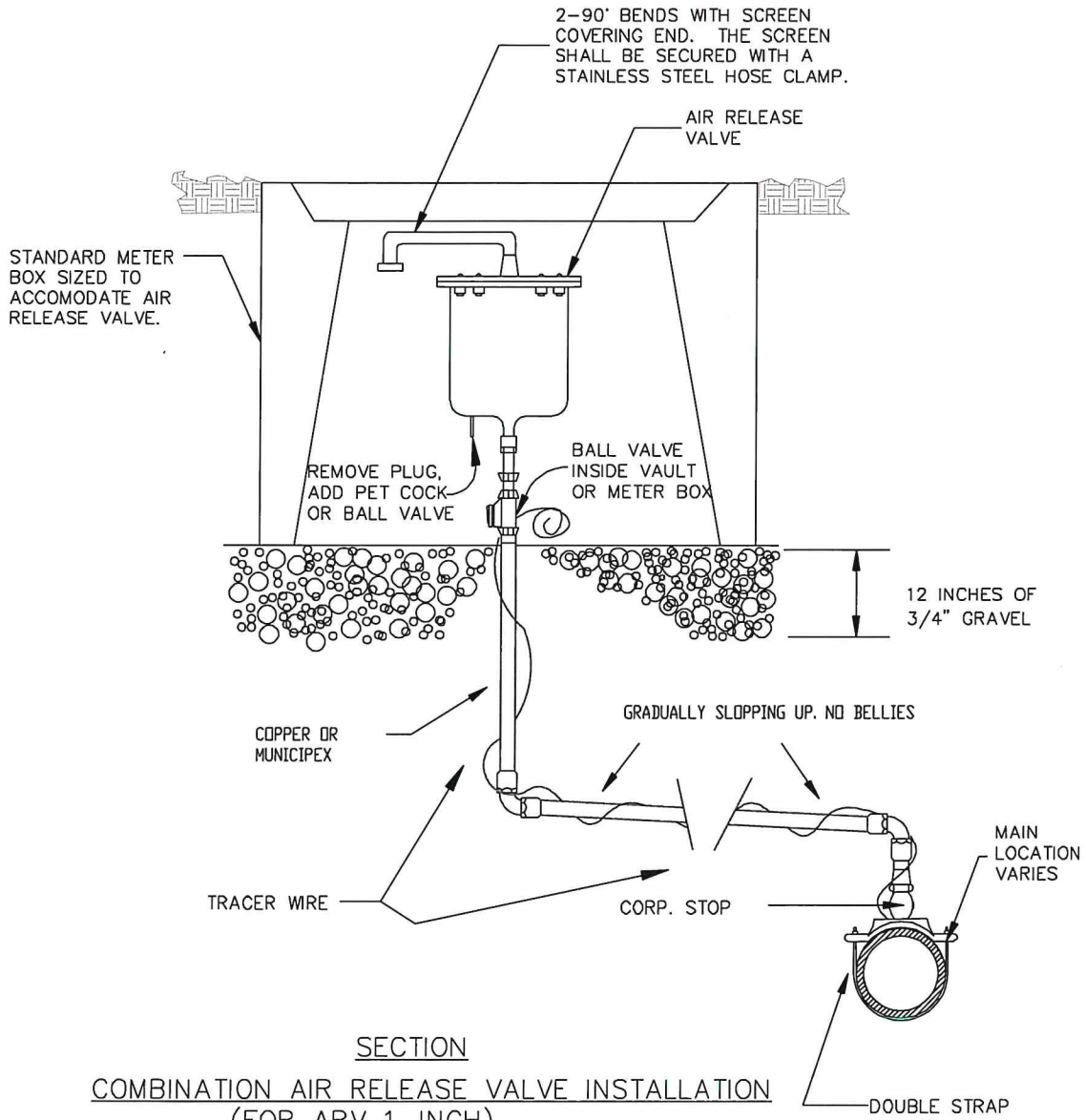
DRILLING MACHINE ADAPTER NIPPLE MODIFICATIONS 2" Ø AND SMALLER



DRILLING MACHINE ADAPTER MODIFICATIONS LARGER THAN 2" Ø

*FACE OFF INNER END OF 1" NIPPLE AFTER INSTALLATION TO PREVENT PROJECTION INTERFERENCE WITH SHELL CUTTER.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	PURGING OF SERVICE LINES	City of Safford	COS-309
REVISED:				SHEET 10 OF 10



SECTION

COMBINATION AIR RELEASE VALVE INSTALLATION
(FOR ARV 1-INCH)

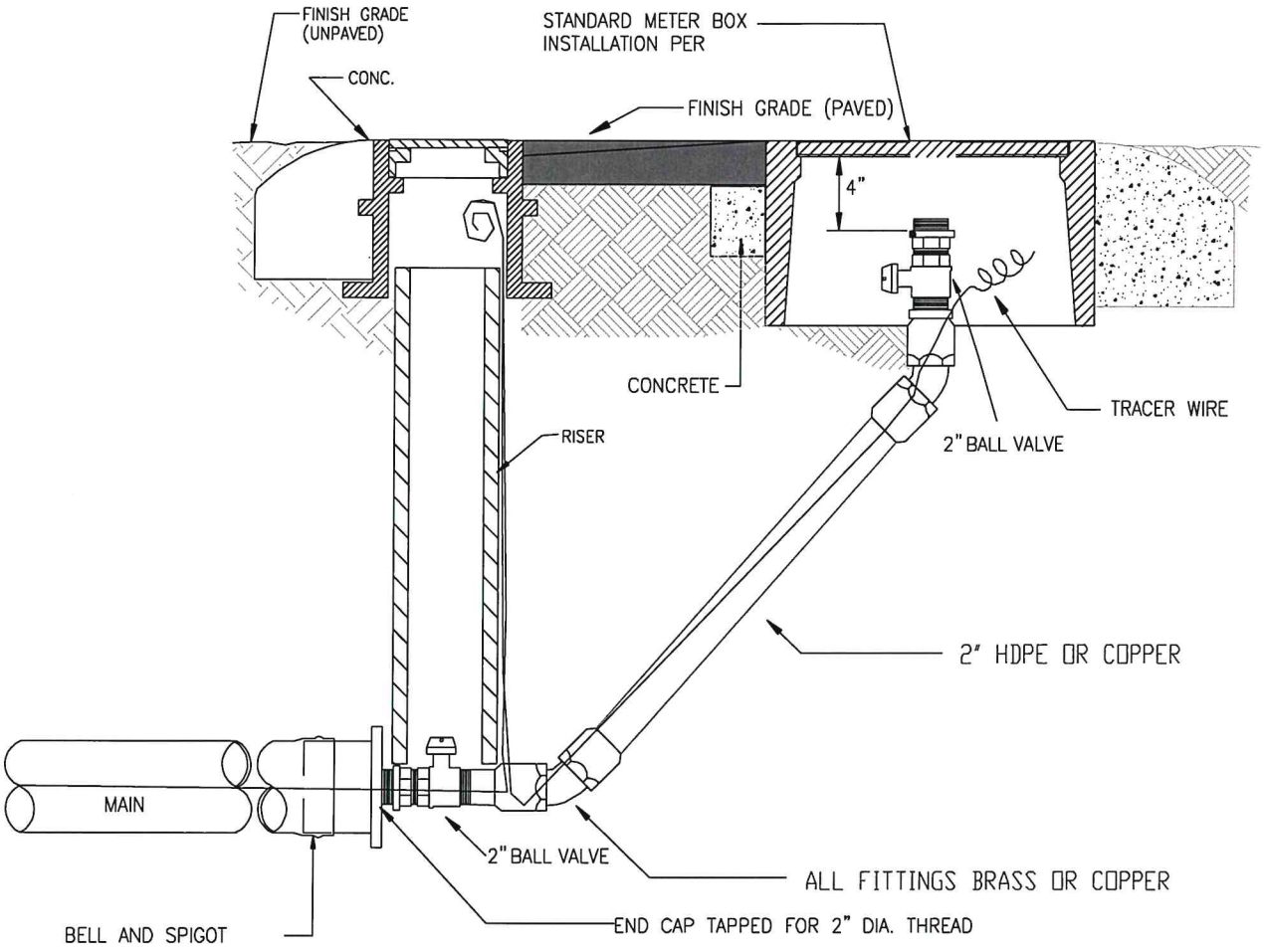
NOTES:

The post must be of sufficient length to support the ball valve.

Air releases shall be set in a flat strip of land which parallels the curb, sidewalk or watermain. The 3' strip of land shall not exceed the top of curb or sidewalk. Set the air release 8" back of curb in streets with curbs. Set the air release 3' from property line in streets without curbs.

All air release valve installations require a tracer wire. The tracer wire shall be USE, RHW, or RHH solid ten gauge and run in a continuous length from the corporation to the ball valve. The tracer wire shall be attached to the air release line with tape or wire ties at 1' intervals. A 3' coil of wire shall be left in the meter box.

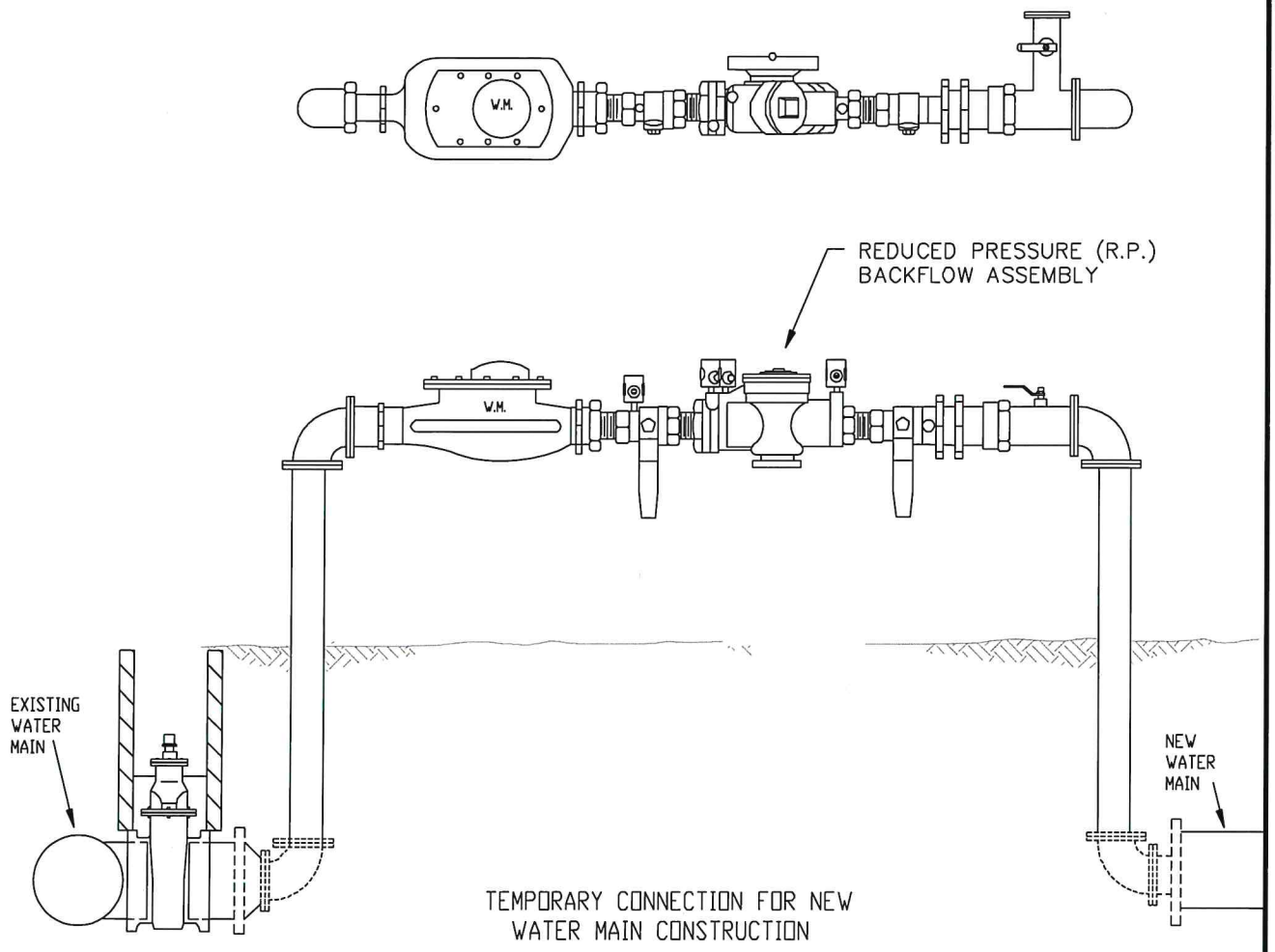
ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	AIR RELEASE VALVE INSTALLATION 1"	City of Safford	COS-330
REVISED:				SHEET 1 OF 1



NOTES:

1. VALVE, PIPE JOINTS, AND END CAP SHALL BE MECHANICALLY RESTRAINED.
2. CONCRETE THRUST BLOCKS MAY BE USED IF APPROVED BY THE ENGINEER.
3. DRAIN VALVE ASSEMBLY SHALL BE INSTALLED ON 6" STUBS MORE THAN 5' IN LENGTH AND ON ALL 8" STUBS MORE THAN 10' IN LENGTH.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	DRAIN VALVE ASSEMBLY	City of Safford	COS-400
REVISED:				SHEET 1 OF 1



TEMPORARY CONNECTION FOR NEW
WATER MAIN CONSTRUCTION

NOTES:

1. BACKFLOW ASSEMBLY SHALL BE INSTALLED, MAINTAINED AND TESTED IN ACCORDANCE WITH STATE AND LOCAL CODES AND REGULATIONS.

2. TEMPORARY CONNECTION TO EXISTING POTABLE MAIN MUST BE APPROVED BY A CITY OF SAFFORD CONSTRUCTION INSPECTOR.

3. WATER TO BE USED FOR FILLING AND FLUSHING OF NEW WATER MAINS ONLY.

4. BACKFLOW ASSEMBLY IS REQUIRED TO BE TURNED OFF AT BOTH SHUT OFF VALVES AND REMAIN OFF WHEN CHLORINATING NEW MAIN.

5. DO NOT LEAVE BACKFLOW ASSEMBLY CONNECTED TO MAIN WITHOUT WATER METER. INSTALLATION MUST COMPLY WITH STANDARD DETAIL AT ALL TIMES.

6. BACKFLOW ASSEMBLY IS A MINIMUM 4" COMPONETS, FOR NEW MAINS 4" AND LARGER.

7. WHEN USING THE CITY OF SAFFORD ASSEMBLY ALL ADAPTOR'S, REDUCERS, AND/OR SLEEVE'S WILL BE PROVIDED BY THE CONTRACTOR.

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/2013	City of Safford	BACKFLOW PREVENTION POTABLE WATER MAIN TEMPORARY CONNECTION FOR TESTING AND FLUSHING OF NEW WATER MAINS ONLY	City of Safford	COS-1809
REVISED:				SHEET 1 OF 1

GRAHAM COUNTY UTILITIES, INC
Acceptable Materials List, 2020

RESDIENTAIL WATER APPLICATIONS		
DESCRIPTION	**MANUFACTURER**	**PART#**
Meter Box for 5/8"-1" Meter	Carson	1419-12
Meter Valve, Angle, 3/4" Meter Coupling x 1" Compression (Utility Side)	Ford	BA43-342W or equivalent
Meter Valve, Lockwing w/ handle, Female I.P. x 3/4" meter coupling	Ford	B13-332W (or equivalent)
Corp Stop Valve, 1" CC x grip	Ford	FB1000-4X-G (or equivalent)

TRACING WIRE FOR MAINS AND SERVICE LINES		
#14 awg SOLID TYPE uf, 600v (ul) DIRECT BURY TRACING WIRE	Service Wire Co.	UF-14
Tracing wire connectors; 600V Gel Cap Connector	3M	DBR-6

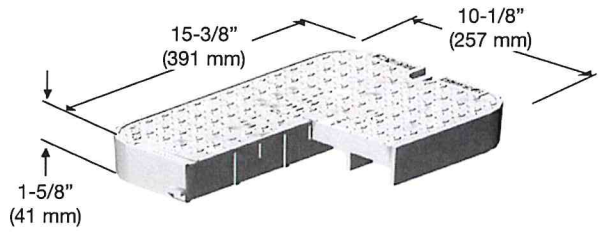
AIR VENT, 1"		
Bottom Assy: Valve, Air Vent 1", UL-10.1, 3/16 orifice, 20-150lb pressure	Crispin	UL-10.1
Bottom Assy: Valve, Corp Stop, 1"	Ford	FB1000-4X-G (or equivalent)
Bottom Assy: Valve, Corp Stop, Lock Wing 1"	Ford	B11-444 (or equivalent)
Bottom Assy: Coupling, CTS X MIP, 1"	Ford	C84-44 (or equivalent)
Top Assy: Nipple, Galb, 34/" x 12"		
Top Assy: Ell, Galv, 90 deg, 3/4"		
Top Assy: Ell, Galv, Street, 34/" x 90 deg		
Top Assy: Vent Screen (filter washer for standard garden hose)	Ace	70333 or equal

CARSON
SPECIFIED AND PREFERRED WORLDWIDE

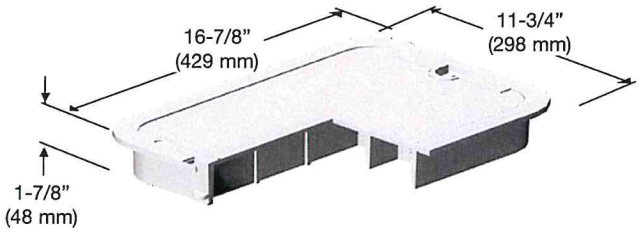
Pomona, California
Toll-Free: 800.735.5566
Phone: 909.634.3020
Fax: 800.827.7111

L Series 1419-12

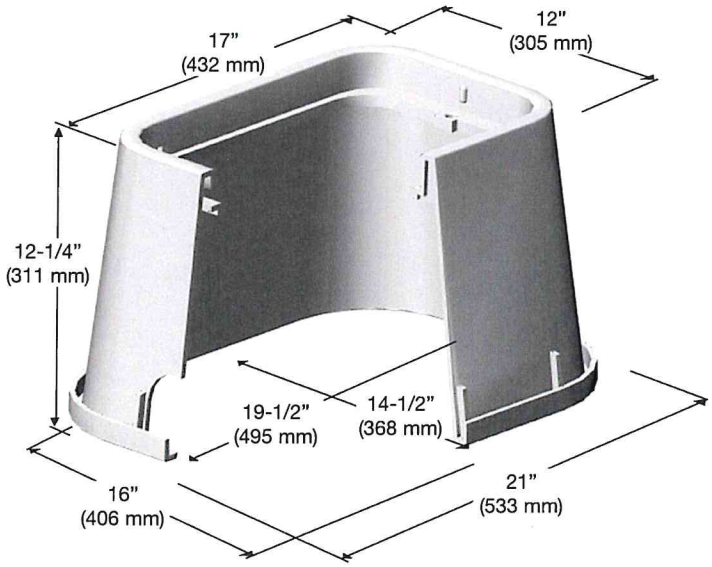
Light Duty



Flush Cover
Material: HDPE
Weight: 3.0 lbs.
Model: 1419-3 No Bolt
1419-3B Bolt Down
See OPTION SECTION:
– Hinged Cover



T-Cover
Material: HDPE
Weight: 3.0 lbs.
Model: 1419-4 No Bolt
1419-4B Bolt Down
See OPTION SECTION:
– Meter reader cover



Body
Material: HDPE
Weight: 7.0 lbs.
Model: 1419-12
See OPTION SECTION:
– Slots

Colors Available
Green, Gray, Black, Tan or Violet

Note: For use in non-vehicular traffic situations only. We do not recommend installation in concrete or asphalt. Weights and dimensions may vary slightly.

Revision Date 4/2003

L Series 1419-12

Light Duty

Static Vertical Load Rating
(Design Load; Test Load)

- ASTM C857 – A-0.3, 300 lbf/ft^2; Report Ultimate
- SCTE – Light Duty, Pedestrian; 3,000 lbf

Oldcastle Precast®
Enclosure Solutions

Pomona, California
Toll-Free: 800.735.5566
Phone: 909.634.3020
Fax: 800.827.7111

Shipping Configuration

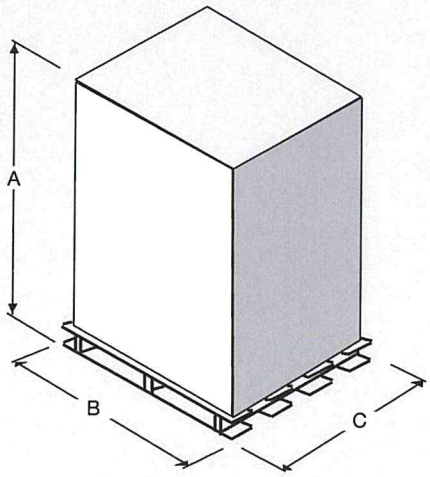
- Unit, 78 assemblies, = 58.5 cu. ft., 860.0 lbs.

Material Property	ASTM Test Method	Typical Value[1]
Type, Class, Category	D 1248	III, A, 3
Density, g/cm^3	D 1505	0.950 min., not to exceed 0.965
Tensile Strength, at break, psi	D 638	3,000 to 4,400
Elongation, at break, %	D 638	400
Tensile Impact, ft-lb/in^2	D 1822	27
Flexural Modulus, psi	D 790	120,000 min., not to exceed 240,000
Low Temperature Brittleness, F50, at °C	D 746	<-76
Hardness, Shore D	D 2240	66
Deflection Temperature, at 66 psi, °F	D 648	150° min., not to exceed 200°
Electrical Dielectric Strength, V/mil	D 149	400 min., not to exceed 600
Molded Product[2]		
Chemical Resistance	D 543	Very Resistant
Water Absorption	D 570	Less than 1% weight change

Note: For use in non-vehicular traffic situations only. We do not recommend installation in concrete or asphalt. Weights and dimensions may vary slightly.

[1]The values listed for physical property measurements are nominal values only. Certain physical property measurements are subject to variations consistent with the test methods and are within a generally accepted range for such values.
[2]Test reports available on request.

Shipping Information



UNIT

Dim.	Description	Value
A	Height	53"
B	Length	40"
C	Width	48"

Units: 78 per pallet
Weight: 820 lbs. per pallet

FLUSH COVER

Dim.	Description	Value
A	Height	50"
B	Length	40"
C	Width	48"

Units: 250 per pallet
Weight: 790 lbs. per pallet

T-COVER

Dim.	Description	Value
A	Height	56"
B	Length	40"
C	Width	48"

Units: 250 per pallet
Weight: 790 lbs. per pallet

BODY

Dim.	Description	Value
A	Height	53"
B	Length	40"
C	Width	48"

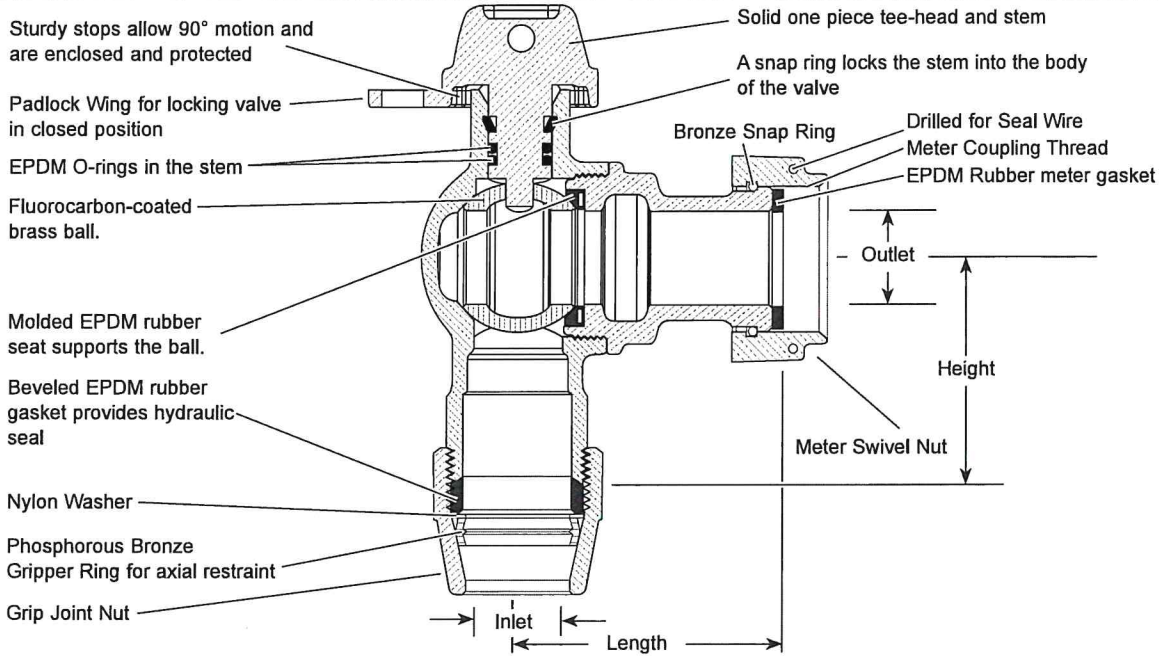
Units: 78 per pallet
Weight: 586 lbs. per pallet

All information contained in this brochure was current at the time of printing. Because of Oldcastle Precast's policy of ongoing research and development, the Company reserves the right to discontinue or update product information without notice.

SUBMITTAL INFORMATION

Angle Ball Meter Valves - *(BA43-3xxW-G style)*

GRIP JOINT FOR COPPER OR PLASTIC TUBING (CTS) INLET BY METER SWIVEL NUT OUTLET



Valve Size	Service Line Size Inlet	Meter Size Outlet	Length	Height	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
3/4"	3/4"	5/8"x3/4" & 3/4"	2-19/64"	1-7/8"	2.2	BA43-332W-G	
3/4"	3/4"	1"	1-63/64"	1-7/8"	2.4	BA43-334W-G	
3/4"	1"	5/8"x3/4" & 3/4"	2-19/64"	2-7/32"	2.4	BA43-342W-G	
3/4"	1"	1"	1-63/64"	2-7/32"	2.5	BA43-344W-G	

Note: Ford recommends using insert stiffeners with plastic pipe or tubing.

FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B-62 and ASTM B-584, UNS NO C83600 - 85-5-5-5)
- Approved to ANSI/NSF Standard 61 (2007a)
- Add "-NL" to end of catalog number for item to be approved to ANSI/NSF Standard 61 and Annex G (372). "NL" items will be made from UNS/CDA No. C89833 alloy
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching handle is provided in tee-head
- 300 PSI working pressure
- Padlock Wing for locking valve in closed position
- Conforms to AWWA C700 for Meter threads

Note: Recommended for inlet side shut-off

Optional full 360° tee-head Rotation. Insert "R" into part number. Example: BA43-331WR-G

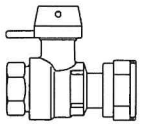
The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

03/08/13

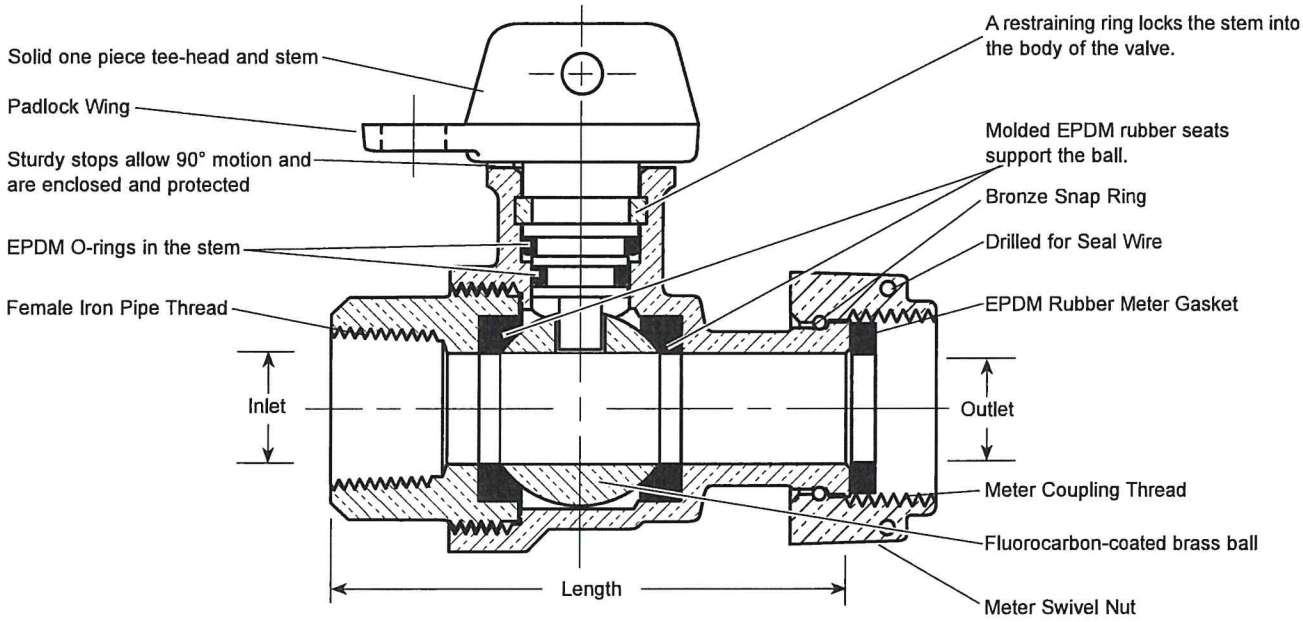
Submitted By:

SUBMITTAL INFORMATION

Straight Ball Meter Valves - *(B13-xxxW style)*



FEMALE IRON PIPE THREAD INLET BY METER SWIVEL NUT OUTLET



Valve Size	Service Line Size Inlet	Meter Size Outlet	Length	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
3/4"	3/4"	5/8"	3-15/16"	1.9	B13-331W	
3/4"	3/4"	5/8"x3/4" & 3/4"	3-1/2"	2.0	B13-332W	
3/4"	1"	5/8"	4-1/8"	2.1	B13-341W	
3/4"	1"	5/8"x3/4" & 3/4"	3-5/8"	2.2	B13-342W	
1"	1"	1"	3-15/16"	2.9	B13-444W	
1"	1-1/4"	1"	4-3/8"	3.1	B13-454W	

FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B-62 and ASTM B-584 UNS NO C83600 - 85-5-5-5)
- Approved to ANSI/NSF Standard 61 (2007a)
- Add "-NL" to end of catalog number for item to be approved to ANSI/NSF Standard 61 and Annex G (372). "NL" items will be made from UNS/CDA No. C89833 alloy
- Padlock Wing for locking valve in closed position
- Valve is non-directional and is watertight with flow in either direction
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching handle is provided in the tee-head
- 300 PSI working pressure

Optional full 360° tee-head rotation. Add "R" to end of part number.

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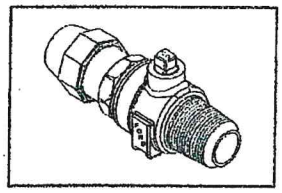
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

03/13/13

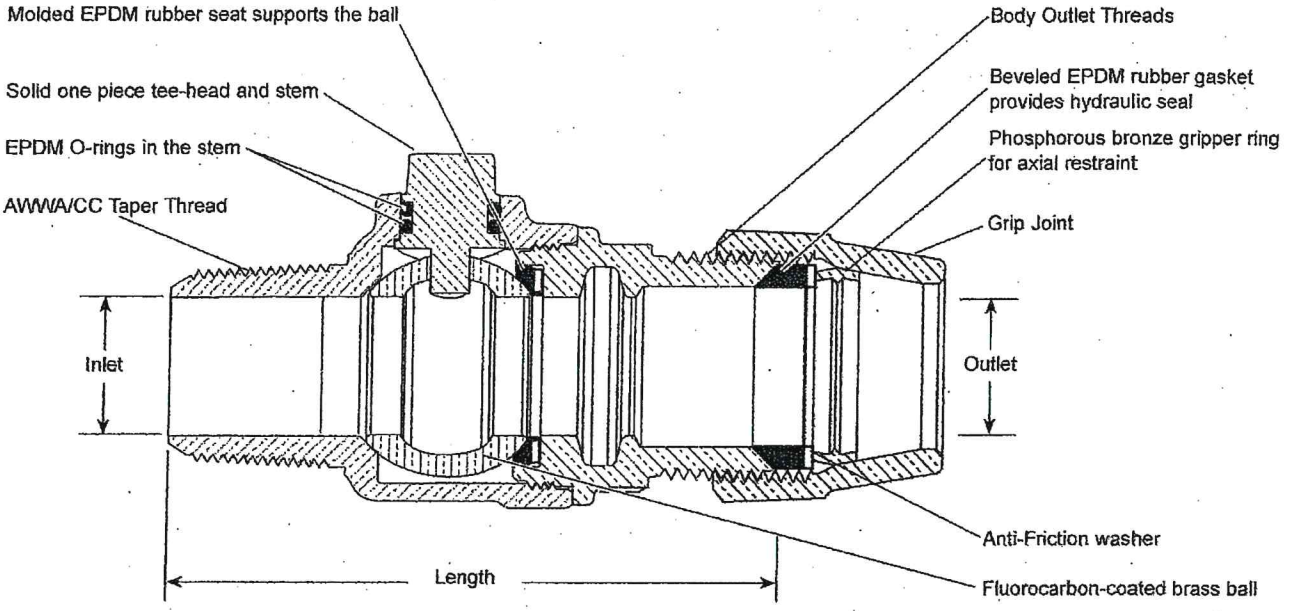
Submitted By:

SUBMITTAL INFORMATION

Ballcorp Corporation Stops - *(FB1000-4x-G style)*



AWWA/CC TAPER THREAD INLET BY GRIP JOINT COMPRESSION FOR COPPER OR PLASTIC TUBING (CTS) OUTLET



Valve Size	Inlet Size	Outlet Size	Valve Length	Body Outlet Threads	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
1"	1"	1"	4-1/2"	1" Flare Copper	2.3	FB1000-4-G	
1"	1"	1-1/4"	4-9/16"	1-1/4" Flare Copper	3.4	FB1000-45-G	

Note: Ford recommends using insert stiffeners with plastic pipe or tubing.

FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B-62 and ASTM B-584, UNS NO C83600 - 85-5-5-5)
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- 300 PSI working pressure
- Approved to ANSI/NSF Standard 61-2007a
- Add "-NL" to end of catalog number for item to be approved to ANSI/NSF Standard 61 and Annex G (372). "NL" items will be made from UNS/CDA No. C89833 alloy.

The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
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http://www.fordmeterbox.com

12/09/12

Submitted By:

Many No-Lead products meet ANSI/NSF Standard 61 Annex G (or proposed ANSI/NSF Standard 372).

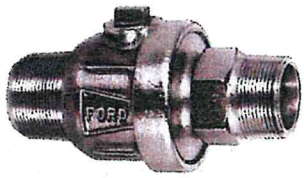
Information

Ford Corporation Stops

The Ford Square Design for Conventional Plug-Type Corporation Stops

As shown above, the Ford "square" design for conventional plug-type Corporation Stop provides larger, more rugged wrench flats. During the installation of almost every Corporation Stop, a wrench must be used across its body to make final adjustments in the main or saddle, or to connect the service line to its outlet. The Ford "square" design puts the wrench flats where they should be – at the strongest part of the body, thus minimizing the danger of leaks from distortion. These larger wrench flats also provide a more secure grip, resulting in less danger of injuring knuckles and hands. *Plug-type Corporation Stops are designed for a maximum working pressure of 100 psi in the 3/4" and 1" sizes. See* AWWA *Standard C800.*

The Revolutionary Ford Ballcorp Corporation Stop



This field-proven Corporation Stop incorporates the performance-proven design features of the popular Ford Ball Valve. It reduces the inherent problems of hard turning and of temporary weeping under high test pressures, which is sometimes encountered in standard plug-type Corporation Stops. The Ford Ballcorp is available in 3/4", 1", 1-1/4", 1-1/2", and 2" sizes, with most styles of outlet connections. It may be installed in either a dry main or a main under pressure with a standard tapping machine or saddle. The large wrench flat assures ease of final adjustment in the main as well as ease in connecting the service line to the stop. *Ford Ballcorp Corporation Stops are designed to withstand working pressures up to 300 psi.*

Ford Corporation Stop Numbering System

TYPE OF CORPORATION STOP

F = Key/Plug Corporation Stop
FB = Ford Ballcorp Corporation Stop
FBRW = Ford Ballcorp Corporation Stop embossed with "Reclaimed Water"

NOTE: 1-1/4", 1-1/2" and 2" sizes are available only as Ford Ballcorp Corporations.

CORPORATION STOP SIZE

1 = 1/2"
2 = 5/8"
3 = 3/4"
4 = 1"
5 = 1-1/4"
6 = 1-1/2"
7 = 2"

CORPORATION STOP SIZE BY INCREASED OUTLET CONNECTION SIZE

23 = 5/8"x3/4"
34 = 3/4"x1"
45 = 1"x1-1/4"
56 = 1-1/4"x1-1/2"
67 = 1-1/2"x2"
78 = 2"x2-1/2"

F 1 0 0 0 - 3 - G

INLET AND OUTLET CONNECTION TYPE

Inlet		Outlet
AWWA	MIP	
200	300	Male Coupling Thread with Inside Driving Thread
400	500	Male Iron Pipe
600	700	Flare Copper
800	900	Increased MIP with Inside Driving Thread
1000	1100	Pack Joint for Copper or Plastic Tubing (CTS)
1001	1101	Pack Joint for PE Pipe
1002	1102	Pack Joint for PVC Pipe
1600	1700	Female Iron Pipe

Note: See item listings in catalog section to assure that desired sizes and options are available.

** Ultra-Tite couplings assembled to corporation stop hand tight.

OPTIONS

G = Grip Joint (3/4"-2" CTS and 3/4" & 1" PEP)
IDR7 = Pack Joint for 1-1/2" and 2" PEP requires dimension ratio designation
NL = No Lead Alloy*
Q = Quick Joint (for indicated items)
TA = Tee-Head Adapter for 1-1/4", 1-1/2" and 2" Ballcorp
TW-Q = CTS Quick Joint Nut with Tracer Wire Terminal
**U-ANWT = Ultra-Tite Coupling (requires a drilling/tapping machine adapter for MIP threads)
**U2-ANWT = Ultra-Tite Coupling (requires a drilling/tapping machine adapter for flare copper threads)
U-AWT = Consists of components assembled watertight to coupling or ell

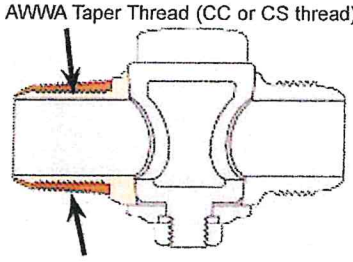
* Brass products manufactured from UNS/CDA No. C89833 alloy, containing no more than 0.10% total lead content by weight, are available. Only brass components in contact with potable water shall be manufactured from the UNS/CDA No. C89833 alloy. Add "-NL" to the end of the catalog number. See note on page A-2.

Specifications

Ford Corporation Stops are designed and manufactured to conform with AWWA Standard C800. This specification covers thread dimensions, the metal alloy (red brass: 85-5-5-5), and the pressure rating for plug style valves. All Ford Stops are individually inspected and tested for leaks with air pressure. They are all compatible with tapping machines of current design.

Inlet Threads

Two types of inlets are available on Ford Corporation Stops, both the conventional plug-type and the Ford Ballcorp Corporation Stop. The AWWA standard thread has a steeper taper than iron pipe threads. When ordering, please use the catalog number applying to type of inlet threads desired.



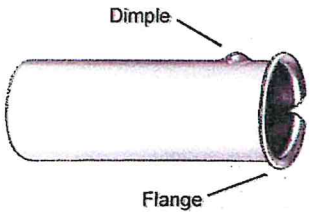
Outlet Connections

Outlet threads on both plug-type and Ford Ballcorp Corporation Stops conform to the following tables in AWWA Standard C800. Series 400, 500, 800, and 900 conform to Table 8; Series 600 and 700 conform to Table 4. Internal driving threads in the 200, 300, 800, and 900 series conform to Table 9.

Plug type and Ford Ballcorp Corporation Stops are available with outlet Pack Joints, Grip Joints, Quick Joints and Ultra-Tite Couplings - see pages 6 and 7 for additional information.

Insert Stiffeners

Many No-Lead products meet ANSI/NSF Standard 61 Annex G (or proposed ANSI/NSF Standard 372).



Ford Insert Stiffeners are solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line.

Before using Ford insert stiffeners, be sure inside tubing or pipe dimensions correspond to the table below.

NOTE: Consult pipe or tubing manufacturer for specific installation requirements. Ford recommends using insert stiffeners when using plastic pipe or tubing, except for Ultra-Tite compression fittings.

50 Series For Polyethylene Tubing (PET)

Catalog Number	Nominal Size	PET ID	Approx. Wt. Lbs.*	Std. Pkg. Qty.
INSERT-51	3/4"	.681	4.8	200
INSERT-52	1"	.875	4.2	100
** INSERT-53-72	1-1/4"	1.069	2.4	50
**♦ INSERT-53-72-Q	1-1/4"	1.069	2.4	50
INSERT-54	1-1/2"	1.263	3.1	25
INSERT-55	2"	1.653	6.0	40
♦INSERT-54-Q	1-1/2"	1.263	2.6	30
♦INSERT-55-Q	2"	1.653	5.8	50

70 Series For Polyethylene Pipe (PEP)

Catalog Number	Nominal Size	PEP ID	Approx. Wt. Lbs.*	Std. Pkg. Qty.
INSERT-71	3/4"	.824	4.4	100
** INSERT-53-72	1"	1.049	2.9	50
**♦ INSERT-53-72-Q	1"	1.049	2.9	50
INSERT-73	1-1/4"	1.380	5.8	75
INSERT-74	1-1/2"	1.610	5.5	45
INSERT-75	2"	2.067	9.7	50

Inserts For OD Controlled PE 3408 High Density Polyethylene (HDPE)

Catalog Number	Nominal Size and Pipe Type	DR	HDPE OD	Nominal ID
INSERT-51	3/4" CTS	9	0.875	0.68
INSERT-52	1" CTS	9	1.125	0.88
▲ INSERT-81-200	3/4" CTS	11	0.875	0.71
** INSERT-53-72	1" IPS	11	1.315	1.055
INSERT-73-DR11	1-1/4" IPS	11	1.660	1.34
INSERT-74-DR11	1-1/2" IPS	11	1.900	1.53
INSERT-75-DR11	2" IPS	11	2.375	1.92

▲ INSERT-81-200 does not have dimples.

* Weights for Insert Stiffeners are for standard package quantities.

** INSERT-53 and INSERT-72 fit 1-1/4" plastic tubing (1.069 I.D.), 1" plastic pipe (1.049 I.D.) and 1" IPS HDPE (1.055 I.D.)

♦ These Inserts are specially designed and required for Quick Joint Fittings. They are not interchangeable with other compression fittings.

DIMENSION COMPARISON TABLE FOR PLASTIC, COPPER AND GALVANIZED IRON

Pipe and Tubing Type		PSI	SDR	Control	O.D.						I.D.					
					1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Copper	–	–	–	OD	.625	.875	1.125	1.375	1.625	2.125	–	–	–	–	–	–
PET	PE3408	200	SDR9	OD	.625	.875	1.125	1.375	1.625	2.125	–	.681	.875	1.069	1.263	1.653
	PE4710	250														
PEP	PE3408	200	SIDR7	ID	–	1.060	1.349	1.774	2.070	2.657	–	.824	1.049	1.380	1.610	2.067
	PE4710	250														
PVC	–	–	–	OD	.840	1.050	1.315	1.660	1.900	2.375	–	–	–	–	–	–
Galv IP	–	–	–	OD	.840	1.050	1.315	1.660	1.900	2.375	–	–	–	–	–	–

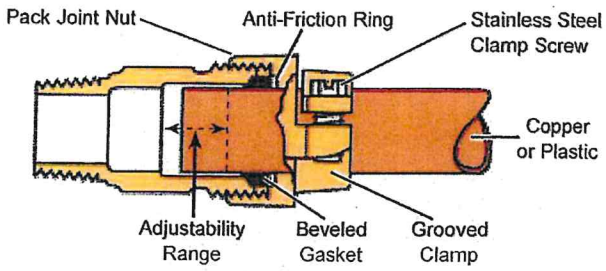
Ford Pack Joints for PVC are recommended for use only with Schedule 40 and Schedule 80 PVC.

*Ford Pack Joint Couplings

Pack Joint Connections - How the Pack Joint Works

1. Tightening the large Pack Joint Nut compresses an EPDM beveled gasket to make it watertight around the pipe or tubing.
2. For copper or plastic tubing and pipe there is a split clamp locking device, which is drawn down securely on the tubing or pipe by tightening a stainless steel screw. For iron pipe, a stainless steel set screw is provided on the Pack Joint to bite in and lock on the pipe.
3. Machined grooves in the clamp provide additional gripping action.

FOR COPPER, PET, PEP OR PVC
(Metal inserts to be used with PET or PEP)



Installation instructions are shipped with product and posted on the Ford Meter Box website. Consult pipe or tubing manufacturer for specific installation requirements.

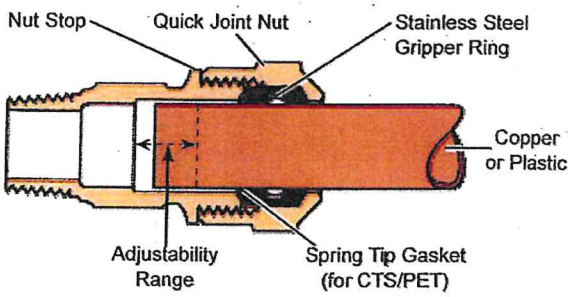
*Ford Quick Joint Couplings

The Ford Quick Joint offers traditional Ford features of quality and reliability. This easy to use fitting is available on a wide variety of Ford products. Just stab the copper or plastic tubing into the fitting and tighten down the compression nut to the external stop. That's it! The Quick Joint provides excellent pullout resistance and superior hydraulic blow-off protection. Note: The Ford Quick Joint Nut is NOT interchangeable with other Compression fittings.

The Ford Quick Joint Connections - How the Quick Joint Works

1. A large gasket and stainless steel gripper ring are drawn down together when the nut is tightened, providing the hydraulic seal and mechanical restraint.
2. A transparent fluorocarbon coating covers the interior of the nut, providing smooth torque transfer. This coating eliminates "back drive", reduces tightening torque and minimizes gasket distortion.
3. A positive, external and visual stop ensures correct installation, providing maximum gasket seal.

FOR 3/4" - 2" COPPER, PET (SDR9) OR 3/4" - 1" PEP
(Metal inserts to be used with PET or PEP)



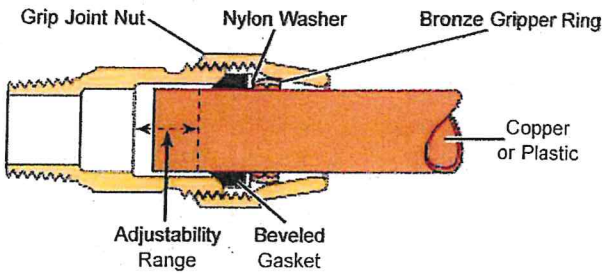
Installation instructions are shipped with product and posted on the Ford Meter Box website. Consult pipe or tubing manufacturer for specific installation requirements.

*Ford Grip Joint Couplings

Grip Joint Connections - How the Grip Joint Works

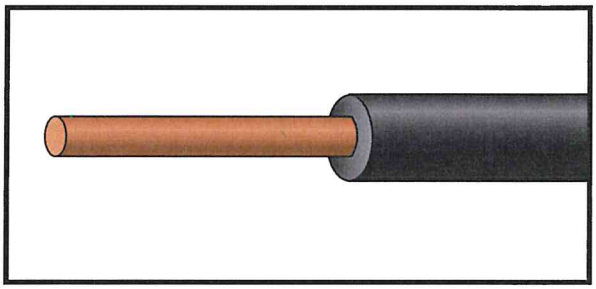
1. Tightening the Grip Joint Nut compresses an EPDM beveled gasket to make it watertight around the pipe or tubing.
2. The bronze split ring is drawn down when the nut is tightened, providing the mechanical seal and lock on the pipe.
3. Grip Joint Couplings are manufactured for copper and PET or 3/4" and 1" PEP.

ONE STEP COUPLING
FOR COPPER, PET OR PEP
(Metal inserts to be used with PET or PEP)



Installation instructions are shipped with product and posted on the Ford Meter Box website. Consult pipe or tubing manufacturer for specific installation requirements.

* See table on page 4 for recommended PE pipe and tubing.



UF / Type TWU

600 Volt Copper

Description & Features:

C(UL) listed Single Conductor Type UF/Type TWU is suitable for use as Sprinkler Irrigation Control Wire for general purpose lighting and power. Construction provides solid or stranded soft annealed copper conductor insulated with PVC that provides excellent abrasion, acid, chemical, oil and moisture resistance.

- UL listed Type UF 600 Volt (#14 thru 4/0 AWG)
- C(UL) Listed Type TWU 600 Volt (#14 thru 4/0 AWG)
- Direct burial rated
- Resistant to acids, alkali, grease and chemicals
- Abrasion, crush and moisture resistant

Applications:

- Suitable for use as power and control conductors for irrigation systems
- For use in accordance per NEC Article 339

Specifications & Standards:

UL 493; UL1581; RoHS Compliant
Federal Spec AA-59544, CSA C22.2 No. 75

Construction:

Conductors: Soft annealed copper
Solid (18 AWG to 8 AWG)
Stranded (6AWG to 4/0 AWG)
Insulation: Thermoplastic PVC
Temperature: 60°C Voltage: 600 Volts

TYPE UF SINGLE CONDUCTOR

Part Number	Conductor AWG	Dimensions (inches)		Standard Packaging			Weight (Lbs./Mft.)
		Insulation	O.D.	500'	1000'	2500'	
ULE18	18 (solid)	.045	.130	X		X	13
ULE16	16 (solid)	.045	.141	X		X	15
UF14	14 (solid)	.060	.184	X		X	27
UF12	12 (solid)	.060	.201	X		X	36
UF10	10 (solid)	.060	.272			X	50
UF8	8 (solid)	.060	.303			X	81
UF6	6 (7 str)	.060	.342		X		121
UF4	4 (7 str)	.080	.389		X		176
UF2	2 (7 str)	.080	.450		X		261
UF1/0	1/0 (19 str)	.095	.557			Bulk	408
UF2/0	2/0 (19 str)	.095	.602			Bulk	502
UF4/0	4/0 (19 str)	.095	.715			Bulk	763

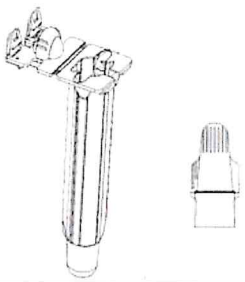
. UL Listed - UNDERGROUND LOW ENERGY 150 VOLT CIRCUIT CABLE SUNLIGHT RESISTANT.
All values are nominal; all weights are exclusive of packaging. All diameters and weights are subject to normal manufacturing tolerances.

STANDARD COLORS

	RD	WE	BE	GN	YW	OE	BN	BK	PE	GY	PK	TN
Single cond. size 18 and 16	S	S	A	A	A	A	A	S	A	A	A	A
Single cond. size 14	S	S	S	S	S	S	S	S	S	S	S	S
Single cond. size 12 and 10	S	S	A	S	A	A	A	S	A	A	A	A
Single cond. size 8 and larger	A	A	A	A	A	A	A	A	A	A	A	A

NOTE: S = Stock, A = Available
All sales are subject to Standard Terms & Conditions of Sale.

3M™ Direct Bury Splice Kit DBR/Y-6



Data Sheet **May 2011**

Applications

The 3M™ Direct Bury Splice Kit DBR/Y-6 is used to electrically connect two or more pre–stripped copper wires and moisture seal the connection for direct burial.

The kit includes a 3M™ Performance Plus Wire Connector R/Y+ and a high impact, UV-resistant polypropylene tube prefilled with moisture-resistant grease.

Agency Approvals & Self Certifications

C UL US Listed, UL Standard 486D, File No. E102356
Listed for use in wet, damp, direct bury and submersible locations with UF type cable.

CE Meets European Standard EN 61984
Applicable ratings under this standard: IP68, Pollution Degree 3

RoHS 2002/95/EC

RoHS Compliant 2002/95/EC" means that the product or part ("Product") does not contain any of the substances in excess of the maximum concentration values in EU Directive 2002/95/EC, as amended by Commission Decision 2005/618/EC, unless the substance is in an application that is exempt under RoHS. This information represents 3M's knowledge and belief, which may be based in whole or in part on information provided by third party suppliers to 3M.

Specifications

Maximum Voltage Rating:	600 V
Application Temperature:	32°F to 120°F (0°C to 49°C)
Operating Temperature:	-40°F to 221°F (-40°C to 105°C)

Construction:

Tube :	Impact and UV Resistant Light Blue Polypropylene
Dimensions:	Length: 3.7in., Cover: 1.5in.x 1.1in., Diameter: 1in.
Grease:	711B
R/Y+ Connector:	Steel Spring, Flame Retardant Insulator

Wire Combinations Copper wire only Solid or Stranded
see chart for all combinations

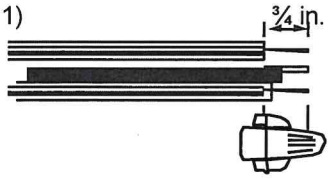
2 - 7 #18	1-3 #12 w/ 1 #18
2 - 6 #16	1-2 #10 w/ 1 #18
2 - 4 #14	1-3 #12 w/ 1 #16
2 - 4 #12	1-2 #10 w/ 1 #12
2 - 3 #10	1-2 #14 w/ 1 #18

3M

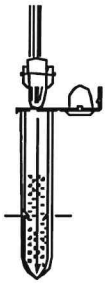
3M™ Direct Bury Splice Kit DBR/Y-6

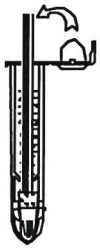
Installation Instructions

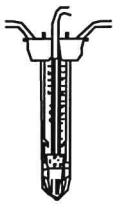
> **⚠ Warning**
> Turn power off before installing or removing connector. All electrical work should be done according to appropriate electrical codes.

1) 

2) 

3) 

4) 

5) 

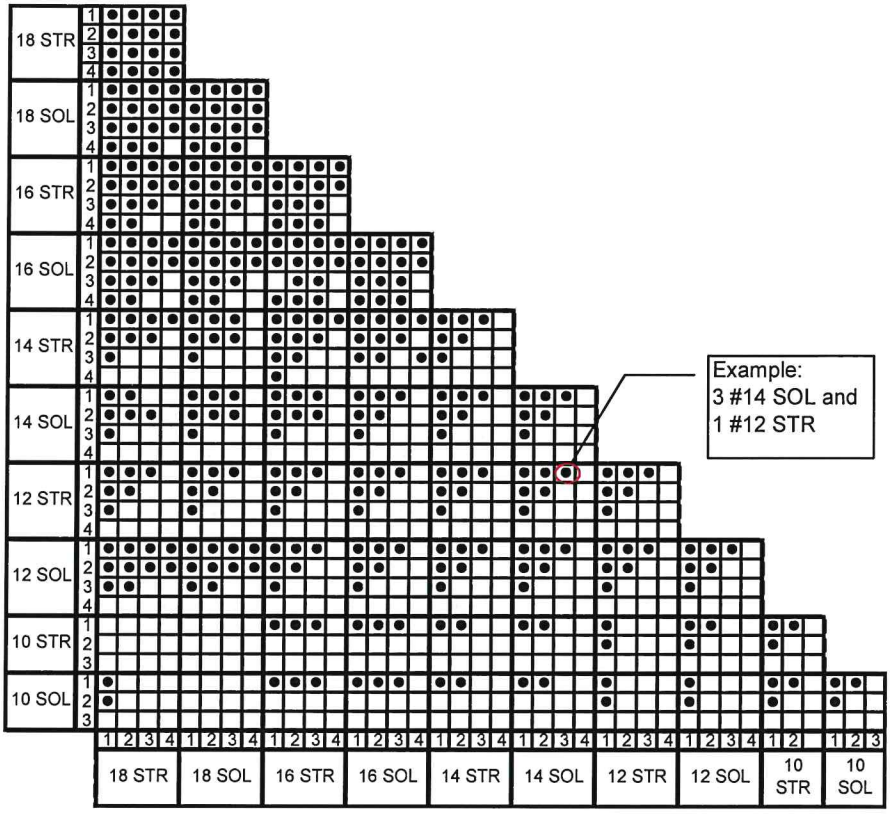
1) Strip insulation ¾ in.
2) With wire ends even, insert wires into the connector and tighten until secure.
3) Insert the connector all the way into the tube until the connector rests on the bottom.
4) Fold the wire into the channels.
5) Close the cap.

Installation Tip:

If having difficulty getting the twist-on connector down into the tube when using small gauge wires, use a thin non-conductive object to push the connector to the bottom of the tube. Upon removal of the object, ensure that no voids or water paths remain in the grease.

3M™ Direct Bury Splice Kit DBR/Y-6

Combination Chart



Shelf Life & Storage	This product has a 5-year shelf life from date of manufacture when stored in a humidity controlled storage (10°C/50°F to 27°C/80°F and <75% relative humidity).
Availability	From your local distributor; or from 3M.com/electrical [Where to Buy] or call 1.800.245.3573.
Important Notice	All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product, which are not contained in 3M's current publications, or any contrary statements contained on your purchase order, shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.
Warranty; Limited Remedy; Limited Liability	This product will be free from defects in material and manufacture at the time of purchase. 3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.

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78-8129-9255-6 B

3M™ Direct Bury Splice DBR/Y-6

Instructions

600 V Maximum
Application Temperature 32°F - 120°F (0°C - 49°C)
Maximum Operating Temperature 221°F (105°C)

c UL us LISTED
98U1
SEALED WIRE
CONNECTOR SYSTEM

UL Standard 486D, 3M File No E102356
For use in damp, wet, direct bury, and submersible locations

CE

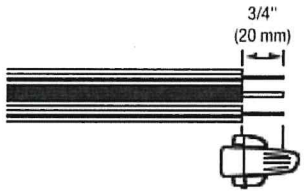
Meets European Standard EN 61984
Applicable ratings under this standard: IP68, Pollution Degree 3

⚠CAUTION

Working around energized systems may cause serious injury or death. Installation should be performed by personnel familiar with good safety practice in handling electrical equipment. De-energize and ground all electrical systems before installing product.

Installation

1. Strip Insulation 3/4".



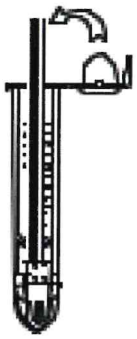
2. With wire ends even, insert wires into the connector and tighten until secure.

3. Insert the connector all the way into the tube until the connector rests on the bottom.

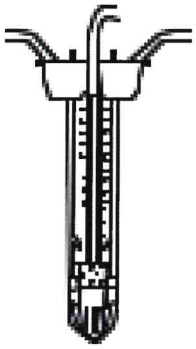
Note: *If having difficulty getting the twist-on connector down into the tube when using small gauge wires, use a thin, non-conductive object to push the connector to the bottom of the tube. Upon removal of the object, ensure that no voids or water paths remain in the grease.*

February 2012
78-8129-9276-2 C

4. Fold the wires into the channels.



5. Close the cap.



Common AWG Combinations

2 – 7 #18	1 – 3 #12 w/ 1 #18
2 – 6 #16	1 – 2 #10 sol w/ 1 #18 str
2 – 4 #14	1 – 3 #12 w/ 1 #16
2 – 4 #14	1 – 2 #10 w/ 1 #12
2 – 3 #10	1 – 2 #14 w/ 1 #18

Copper Wire Only, Solid or Stranded* unless noted
*See data sheet for all combinations.

No adverse health effects expected; for professional or industrial use only.
Contains white mineral oil grease, CAS# 8042-47-5

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78-8129-9276-2 C

UL SERIES

Universal Air Release Valve

Valve Function

- Allows air to escape a pipeline as it is being filled
- Allows air to enter a pipeline as it is being emptied
- Allows accumulating air to escape while a line is in operation and under pressure

Features Include

- Meets AWWA C-512
- Compound lever system
- NPT screwed or ANSI Class Flanges

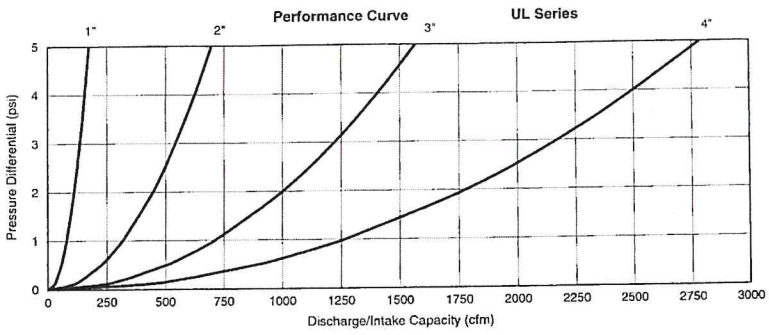
With Stainless Steel Trim or Bronze and Stainless Steel Trim

The Universal Air Valve is designed to permit the automatic escape of large quantities of air from a pipeline when the line is being filled, and to permit air to enter the pipeline when the line is being emptied. It also allows accumulating air to escape while the line is in operation and under pressure. This is accomplished with a compound lever system functioning in conjunction with a large and small orifice in one integral body casting.

As the liquid rises into the valve, air escapes through the large orifice to the atmosphere. Liquid entering the valve raises the float and lever system, carrying with it the pressure plunger and the main valve.

When the liquid has raised the float to its limit, the stainless steel main valve rests against the seat. The pressure plunger also rests against its seat, which is the main valve. In this position, the valve is closed and no liquid can escape.

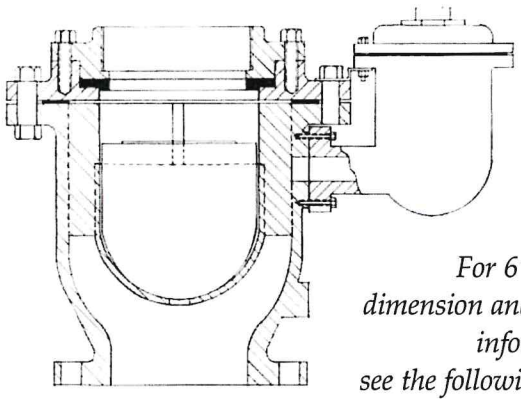
Air & Vacuum Orifice Performance Curves



UL Crispin Valve, 600 Fowler Ave., Berwick, PA 18603 • 1-800-AIR-VALV • T: (570) 752-4524 • F: (570) 752-4962 • WWW.CRISPINVALVE.COM • sales@crispinvalve.com

Universal Air Release Valve

6" and 8" Combination Valve Detail



For 6" and 8" dimension and weight information, see the following page.

Model Information

Size of Valve	1"	2"	3"	4"	6"	8"
Model No. Screwed Inlet	UL10.1 UL10	UL20.1 UL20	UL30.1 UL30	UL40.1 UL40		
125# Flanged Inlet		UL21.1 UL21	UL31.1 UL31	UL41.1 UL41	C61	C81
250# Flanged Inlet		UL22.1 UL22	UL32.1 UL32	UL42.1 UL42	C62	C82

Discharge in SCFM

Operating Pressure (PSIG)	ORIFICE SIZE				
	3/32"	1/8"	5/32"	3/16"	1/4"
150	13.8	24.4	37.9	54.6	98
200	17.9	31.9	49.5	72	127
250	22.1	39.2	61.1	88	157
300	26.4	46.7	73	105	187

Orifice Sizing Information

Valve Size	MAXIMUM OPERATING PRESSURE IN PSI			
	Max. 150	Max. 200	Max. 250	Max. 300
1"	3/16"	3/32"	3/32"	3/32"
2"	1/4"	3/16"	3/16"	1/8"
3"	1/4"	3/16"	3/16"	1/8"
4"	1/4"	3/16"	3/16"	1/8"
6"	1/4"	3/16"	3/16"	1/8"
8"	1/4"	3/16"	3/16"	1/8"

If accumulating air rises into the valve while the line is in operation and under pressure, it will displace the liquid at the top of the valve body and the float will drop as the liquid recedes. As this occurs, the pressure valve will open, permitting the escape of the accumulated air, after which the liquid level will rise and the valve will close.

Should the pipeline be drained through natural processes or should a large break develop, the float will drop all the way down as the liquid level drains from the valve body. The valve will then stay in the full open position permitting the entrance of air and eliminating the danger of pipeline collapse due to vacuum.

These cycles will repeat automatically as each condition presents itself, and the valve will function satisfactorily with hot or cold water, and in the presence of many chemicals and oil-base liquids.

UL SERIES

Universal Air Release Valves

Universal Air Release Valve

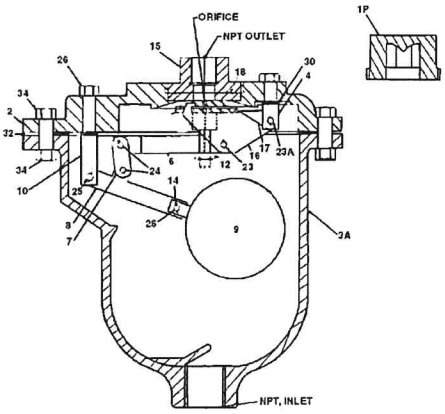
Universal Valves

Parts List: 1"–4" Valves

PART NO.	ITEM	MATERIAL
1P*	PROTECTOP	Cast Iron
1S*	TOP	Cast Iron
2	FLANGE	Cast Iron
3*	BODY, SCREWED	Cast Iron
3F*	BODY, 125 LB FLG.	Cast Iron
3FH*	BODY, 250 LB FLG	Cast Iron
4	A&V FULCRUM	Stainless Steel
5&16	PRESSURE FULCRUM	Stainless Steel
6	VALVE LEVER	Stainless Steel
7	LINK	Stainless Steel
8	BALL LEVER	Stainless Steel
9	BALL FLOAT	Stainless Steel
10	BALL FULCRUM	Stainless Steel
13	NUT	Stainless Steel
14	PRESSURE VALVE PLUNGER	Rubber/S/S
15	PRESSURE SEAT	Stainless Steel
17	SEAT CAGE	Stainless Steel
18	A&V SEAT	Rubber
21	PRESS LIMIT STOP	Stainless Steel
23	BEARING PIN	Stainless Steel
23A	BEARING PIN	Stainless Steel
24	BEARING PIN	Stainless Steel
25	BEARING PIN	Stainless Steel
26	PIN CLIP	Stainless Steel
28	SCREW	Stainless Steel
29	DRAIN PLUG	Steel
30	FULCRUM WASHER	Fibre
31	FULCRUM WASHER	Fibre
32	FLANGE GASKET	Armstrong
33	FLANGE BOLT	Steel
34	FLANGE NUT	Steel
35	A&V FULCRUM NUT	Steel
36	BALL FULCRUM NUT	Steel

Dimensions and Weights

MODEL	INLET	TRIM	HEIGHT	WIDTH	LENGTH	WT(LBS)
UL10	1" NPT	S/S	10 1/4"	6 7/8"	9 3/4"	27
UL10.1	1" NPT	S/S/BRASS	10 1/4"	6 7/8"	9 3/4"	27
UL20	2" NPT	S/S	13 1/2"	8 3/8"	12 3/8"	72
UL20.1	2" NPT	S/S/BRASS	13 1/2"	8 3/8"	12 3/8"	72
UL21	2" 125# Flg.	S/S	17"	8 3/8"	12 3/8"	74
UL21.1	2" 125# Flg.	S/S/BRASS	17"	8 3/8"	12 3/8"	74
UL22	2" 250# Flg.	S/S	17 1/4"	8 3/8"	12 3/8"	75
UL22.1	2" 250# Flg.	S/S/BRASS	17 1/4"	8 3/8"	12 3/8"	75
UL30	3" NPT	S/S	17 1/4"	10 1/4"	14 3/4"	111
UL30.1	3" NPT	S/S/BRASS	17 1/4"	10 1/4"	14 3/4"	111
UL31	3" 125# Flg.	S/S	20 5/8"	10 1/4"	14 3/4"	131
UL31.1	3" 125# Flg.	S/S/BRASS	20 5/8"	10 1/4"	14 3/4"	131
UL32	3" 250# Flg.	S/S	21"	10 1/4"	14 3/4"	133
UL32.1	3" 250# Flg.	S/S/BRASS	21"	10 1/4"	14 3/4"	133
UL40	4" NPT	S/S	20"	11 3/4"	16 3/4"	163
UL40.1	4" NPT	S/S/BRASS	20"	11 3/4"	16 3/4"	163
UL41	4" 125# Flg.	S/S	23"	11 3/4"	16 3/4"	180
UL41.1	4" 125# Flg.	S/S/BRASS	23"	11 3/4"	16 3/4"	180
UL42	4" 250# Flg.	S/S	23 5/16"	11 3/4"	16 3/4"	183
UL42.1	4" 250# Flg.	S/S/BRASS	23 5/16"	11 3/4"	16 3/4"	183
C61	6" 125# Flg.	S/S	16 1/4"	15"	22 7/8"	198
C62	6" 250# Flg.	S/S	16 3/4"	15"	22 7/8"	222
C81	8" 125# Flg.	S/S	18 1/8"	17 3/4"	25 3/8"	290
C82	8" 250# Flg.	S/S	18 5/8"	17 3/4"	25 3/8"	320



* The above parts are interchangeable at the customer's request.

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Submittal Sheet for Crispin UL Series

1" Universal Air Release Valve

Manufactured in compliance with ANSI/AWWA C512 **Date: October, 2001**

SUBMITTAL SHEET FOR UL SERIES

Orifice Options

DIAMETER	MAX. PRESSURE	FLOW RATE
3/16	150 PSIG	54.6 SCFM
3/32	300 PSIG	26.4 SCFM

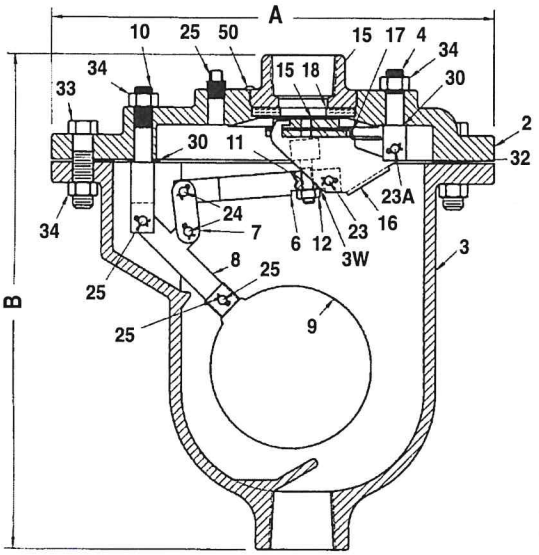
Size Specifications

MODEL	INLET SIZE	OUTLET SIZE	A	B	WHT.
UL10	1" NPT	1" NPT	9.75	10.75	27
UL10.1	1" NPT	1" NPT	9.75	10.75	27

Parts List

ITEM	DESCRIPTION	MATERIAL	ASTM
1S	TOP	CAST IRON	A126 CL.B
2	FLANGE	CAST IRON	A126 CL.B
3	BODY	CAST IRON	A126 CL.B
3W	LOCK WASHER	STAINLESS STEEL	A240
4	AIR & VAC FULCRUM	STAINLESS STEEL	A240
**6	VALVE LEVER	STAINLESS STEEL	A582
7	LINK	STAINLESS STEEL	A240
8	BALL LEVER	STAINLESS STEEL	A240
9	FLOAT	STAIN LESS STEEL	A240
10	BALL FULCRUM	STAINLESS STEEL	A582
11	VALVE PLUNGER	STAINLESS STEEL & BUNA-N RUBBER	A193
12	PLUNGER NUT	STAINLESS STEEL	A194
15	PRESSURE SEAT	STAINLESS STEEL	A582
16	PRESSURE FULCRUM	STAINLESS STEEL	A240
17	SEAT CAGE	STAINLESS STEEL	A240
18	AIR & VAC SEAT	BUNA–N RUBBER	N/A
23	BEARING PIN	STAINLESS STEEL	A582
23A	BEARING PIN	STAINLESS STEEL	A582
24	BEARING PIN	STAINLESS STEEL	A582
25	BEARING PIN	STAINLESS STEEL	A582
26	COTTER PIN	STAINLESS STEEL	A313
29	DRAIN PLUG	BRASS	B505
30	FULCRUM WASHER	FIBER	N/A
32	FLANGE GASKET	ARMSTRONG N–8092	N/A
33	FLANGE BOLT	STEEL	A307
34	NUT	STEEL	A563
50	INTERFERENCE PIN	STAINLESS STEEL	A582

**** Material for UL10.1 will be brass**



Specifications

The valve(s) shall be installed at the high points in the system or at points selected by the engineer. This will permit discharging the surge of air from an empty line when filling, and relieve the vacuum when draining the system. The valve(s) shall also release an accumulation of air when the system is under pressure. This shall be accomplished in a single valve body.

The valve(s) shall operate through a compound lever system which will seal both the pressure orifice and the air and vacuum orifice simultaneously. This lever system shall permit a _____" orifice to release an accumulation of air from the valve body at a capacity of _____ SCFM of air and pressure of _____ PSIG.

The function of the lever system shall also permit a positive disengagement of the main valve from the large orifice, as the float drops and pressure decreases. The disengagement shall be immediate and not limited to the initial draw of a vacuum.

The valve(s) shall be Crispin Model _____ Universal Air Valve as manufactured by Multiplex Manufacturing Co., Berwick, PA. The valve(s) shall be _____" NPT screwed or ANSI Class (125, 250) flanged inlet connection, and shall have a cast iron body, top and inlet flange (where required), stainless steel float and trim with Buna-N seat. Valves which operate the pressure plunger via a single lever and fulcrum will not be acceptable.

Option: A protectop will be supplied to prevent debris from entering the outlet of the valve.

Option: (Where pressures are greater than 300 PSIG), the valve(s) shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel, or ductile iron) body, top and inlet flange.

Standard operating pressure for Crispin Air Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ:
____ 2 to 40 PSIG ____ 151 to 300 PSIG

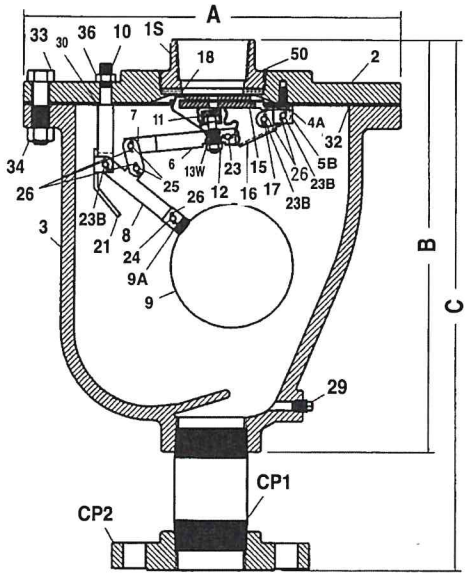
Crispin Valve, 600 Fowler Ave., Berwick, PA 18603 • 1-800-AIR-VALV • T: (570) 752-4524 • F: (570) 752-4962 • WWW.CRISPINVALVE.COM • sales@crispinvalve.com

SUBMITTAL SHEET FOR UL SERIES

Submittal Sheet for Crispin UL Series

2" Universal Air Release Valve

Manufactured in compliance with ANSI/AWWA C512 **Date: October, 2001**



Specifications

The valve(s) shall be installed at the high points in the system or at points selected by the engineer. This will permit discharging the surge of air from an empty line when filling, and relieve the vacuum when draining the system. The valve(s) shall also release an accumulation of air when the system is under pressure. This shall be accomplished in a single valve body.

The valve(s) shall operated through a compound lever system which will seal both the pressure orifice and the air and vacuum orifice simultaneously. This lever system shall permit a _____" orifice to release an accumulation of air from the valve body at a capacity of _____ SCFM of air and pressure of _____ PSIG.

The function of the lever system shall also permit a positive disengagement of the main valve from the large orifice, as the float drops and pressure decreases. The disengagement shall be immediate and not limited to the initial draw of a vacuum.

The valve(s) shall be Crispin Model _____ Universal Air Valve as manufactured by Multiplex Manufacturing Co., Berwick, PA. The valve(s) shall be _____" NPT screwed or ANSI Class (125, 250) flanged inlet connection, and shall have a cast iron body, top and inlet flange (where required), stainless steel float and trim with Buna-N seat. Valves which operate the pressure plunger via a single lever and fulcrum will not be acceptable.

Option: A protectop will be supplied to prevent debris from entering the outlet of the valve.

Option: (Where pressures are greater than 300 PSIG), the valve(s) shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel, or ductile iron) body, top and inlet flange.

All Crispin Valves are hydrostatically tested at 150% of their maximum working pressure. Standard operating pressure for Crispin Air Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ: ____ 2 to 40 PSIG ____ 151 to 300 PSIG

**** Material for UL2_.1 will be brass**

Orifice Options

DIAMETER	MAX. PRESSURE	DISCHARGE RATE
1/4"	150 PSIG	98 SCFM
3/16"	250 PSIG	88 SCFM
1/8"	300 PSIG	46.7 SCFM

Size Specifications

MODEL	INLET SIZE	OUTLET SIZE	A	B	C	WHT.
UL20	2" NPT	2" NPT	12.50	13.50		72
UL20.1	2" NPT	2" NPT	12.50	13.50		72
*UL21	2" 125# FLG	2" NPT	12.50		17.00	78
UL21.1	2" 125# FLG	2" NPT	12.50		17.00	78
UL22	2" 250# FLG	2" NPT	12.50		17.25	89
UL22.1	2" 250# FLG	2" NPT	12.50		17.25	89

*** Includes ANSI Class 125 or 250 Companion FLG and NPL**

Parts List

ITEM	DESCRIPTION	MATERIAL	ASTM
1S	TOP	CAST IRON	A126 CL.B
2	FLANGE	CAST IRON	A126 CL.B
3	BODY	CAST IRON	A126 CL.B
4A	CAP SCREW	STAINLESS STEEL	A193
5B	AIR & VAC FULCRUM	STAINLESS STEEL	A240
**6	VALVE LEVER	STAINLESS STEEL	A582
7	LINK	STAINLESS STEEL	A240
8	BALL LEVER	STAINLESS STEEL	A240
9	FLOAT	STAINLESS STEEL	A240
9A	FLOAT ROD	STAINLESS STEEL	A582
10	BALL FULCRUM	STAINLESS STEEL	A582
11	VALVE PLUNGER	STAINLESS STEEL & BUNA-N RUBBER	A193
12	PLUNGER NUT	STAINLESS STEEL	A194
13W	LOCK WASHER	STAINLESS STEEL	A240
15	PRESSURE SEAT	STAINLESS STEEL	A582
16	PRESSURE FULCRUM	STAINLESS STEEL	A240
17	SEAT CAGE	STAINLESS STEEL	A240
18	AIR & VAC SEAT	BUNA–N RUBBER	N/A
21	PRESSURE LIMIT STOP	STAINLESS STEEL	A240
23	BEARING PIN	STAINLESS STEEL	A582
23A	BEARING PIN	STAINLESS STEEL	A582
23B	BEARING PIN	STAINLESS STEEL	A582
24	BEARING PIN	STAINLESS STEEL	A582
25	BEARING PIN	STAINLESS STEEL	A582
26	COTTER PIN	STAINLESS STEEL	A313
29	DRAIN PLUG	BRASS	B505
30	FULCRUM WASHER	FIBER	D710
32	FLANGE GASKET	ARMSTRONG N–8092	N/A
33	FLANGE BOLT	STEEL	A307
34	NUT	STEEL	A563
36	BALL FULCRUM NUT	STEEL	A563
50	INTERFERENCE PIN	STAINLESS STEEL	A582

FLANGE CONNECTION PARTS

CP1	NIPPLE	STEEL	A53
CP2	COMPANION FLANGE	CAST IRON	A126 CL. B

UL Crispin Valve, 600 Fowler Ave., Berwick, PA 18603 • 1-800-AIR-VALV • T: (570) 752-4524 • F: (570) 752-4962 • WWW.CRISPINVALVE.COM • sales@crispinvalve.com

Submittal Sheet for Crispin UL Series

3"–4" Universal Air Release Valve

Manufactured in compliance with ANSI/AWWA C512 **Date: October, 2001**

SUBMITTAL SHEET FOR UL SERIES

Orifice Options

DIAMETER	MAX. PRESSURE	DISCHARGE RATE
1/4"	150 PSIG	98 SCFM
3/16"	250 PSIG	88 SCFM
1/8"	300 PSIG	46.7 SCFM

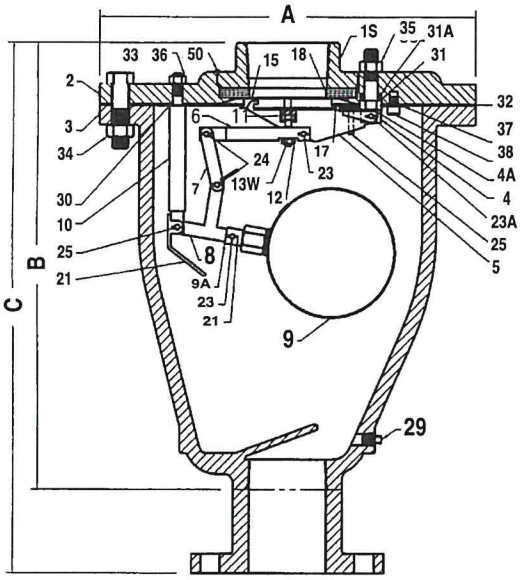
Size Specifications

MODEL	INLET SIZE	OUTLET SIZE	A	B	C	WHT.
UL30	3"NPT	3" NPT	14.75	18.00		114
UL31	3" 125# FLG	3" NPT	14.75		20.50	125
UL32	3" 250# FLG	3" NPT	14.75		21.00	131
UL30.1	3" NPT	3" NPT	14.75	18.00		114
UL31.1	3" 125# FLG	3" NPT	14.75		20.50	125
UL32.1	3" 250# FLG	3" NPT	14.75		21.00	131
UL40	4" NPT	4" NPT	16.75	20.00		162
UL41	4" 125# FLG	4" NPT	16.75		23.00	177
UL42	4" 250# FLG	4" NPT	16.75		23.25	188
UL40.1	4" NPT	4" NPT	16.75	20.00		162
UL41.1	4" 125# FLG	4" NPT	16.75		23.00	177
UL42.1	4" 250# FLG	4" NPT	16.75		23.25	188

Parts List

ITEM	DESCRIPTION	MATERIAL	ASTM
1S	TOP	CAST IRON	A126 CLB
2	FLANGE	CAST IRON	A126 CLB
3	BODY	CAST IRON	A126 CLB
4	AIR/VAC FULCRUM	STAINLESS STEEL	A240
4A	FULCRUM BOLT	STAINLESS STEEL	A193
5	PRESSURE FULCRUM	STAINLESS STEEL	A240
**6	VALVE LEVER	STAINLESS STEEL	A582
7	LINK	STAINLESS STEEL	A240
8	BALL LEVER	STAINLESS STEEL	A240
9	FLOAT	STAINLESS STEEL	A240
9A	FLOAT ROD	STAINLESS STEEL	A582
10	BALL FULCRUM	STAINLESS STEEL	A582
11	VALVE PLUNGER	STAINLESS STEEL& BUNA-N RUBBER	A193/D2000
12	PLUNGER NUT	STAINLESS STEEL	A194
13W	LOCK WASHER	STAINLESS STEEL	A240
15	PRESSURE SEAT	STAINLESS STEEL	A582
17	SEAT CAGE	STAINLESS STEEL	A240
18	AIR & VAC SEAT	BUNA-N RUBBER	D2000
21	PRESSURE LIMIT STOP	STAINLESS STEEL	A240
23	BEARING PIN	STAINLESS STEEL	A582
23A	BEARING PIN	STAINLESS STEEL	A582
24	BEARING PIN	STAINLESS STEEL	A582
25	BEARING PIN	STAINLESS STEEL	A582
26	COTTER PIN	STAINLESS STEEL	A313
29	DRAIN PLUG	BRASS	B505
30	FULCRUM WASHER	FIBER	D710
31	FULCRUM WASHER	FIBER	D710
31A	FULCRUM WASHER	FIBER	D710
32	FLANGE GASKET	ARMSTRONG N-8092	N/A
33	FLANGE BOLT	STEEL	A307
34	NUT	STEEL	A563
35	AIR/VAC FULCRUM NUT	STEEL	A563
36	BALL FULCRUMNUT	STEEL	A563
37	ADJUSTING PLATE	STAINLESS STEEL	A240
38	BOLT	STAINLESS STEEL	A193
50	INTERFERENCE PIN	STAINLESS STEEL	A582

**** Material for UL30.1, UL.31.1, UL40.1, UL41.1, UL42.1 will be brass**



Specifications

The valve(s) shall be installed at the high points in the system or at points selected by the engineer. This will permit discharging the surge of air from an empty line when filling, and relieve the vacuum when draining the system. The valve(s) shall also release an accumulation of air when the system is under pressure. This shall be accomplished in a single valve body.

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The valve(s) shall be Crispin Model _____ Universal Air Valve as manufactured by Crispin-Multiplex Manufacturing Co., Berwick, PA. The valve(s) shall be _____" NPT screwed or ANSI Class (125, 250) flanged inlet connection, and shall have a cast iron body, top and inlet flange (where required), stainless steel float and trim with Buna-N seat. Valves which operate the pressure plunger via a single lever and fulcrum will not be acceptable.

Option: A protectop will be supplied to prevent debris from entering the outlet of the valve.

Option: (Where pressures are greater than 300 PSIG), the valve(s) shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel, or ductile iron) body, top and inlet flange.

Standard operating pressure for Crispin Air Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ:

____ 2 to 40 PSIG ____ 151 to 300 PSIG

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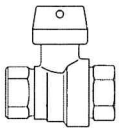
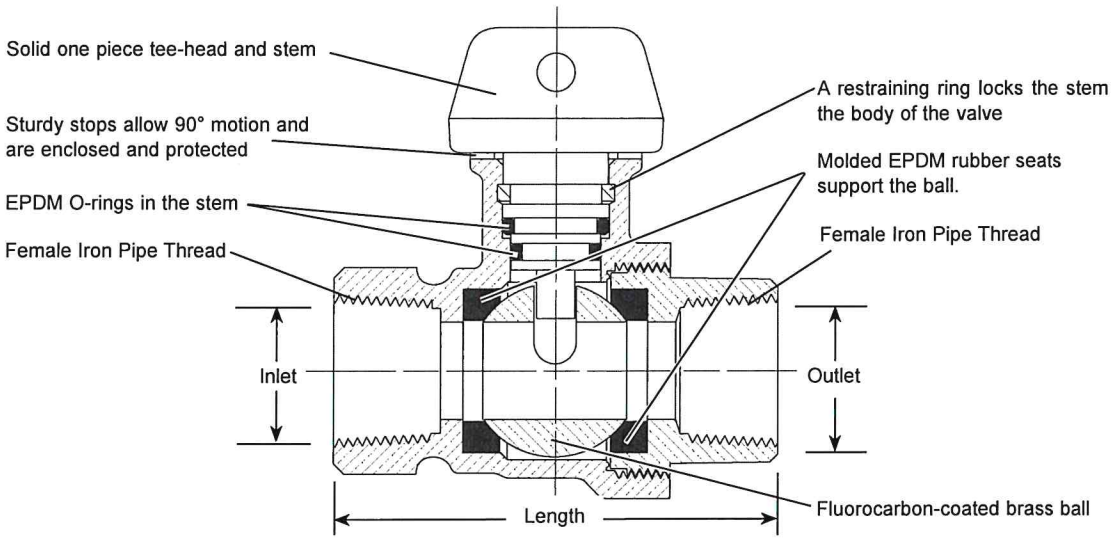
SUBMITTAL INFORMATION

Ball Valve Curb Stop - *(B11-xxx style)*



FEMALE IRON PIPE THREAD INLET BY FEMALE IRON PIPE THREAD OUTLET



Valve Size	Inlet Size	Outlet Size	Length	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
3/4"	3/4"	3/4"	3-3/8"	1.9	▼ B11-333	
3/4"	1"	3/4"	3-9/16"	2.0	▼ B11-343	
3/4"	1"	1"	3-11/16"	2.1	▼ B11-344	
3/4"	1"	1"	4-1/2"	2.3	▼ BL11-344-4.5	
1"	1"	1"	3-13/16"	2.5	▼ B11-444	
1"	1-1/4"	1"	4-3/16"	2.9	▼ B11-454	
1"	1-1/4"	1-1/4"	4-7/16"	3.1	▼ B11-455	
1-1/2"	2"	1-1/2"	5"	6.4	B11-676	
1-1/2"	2"	2"	5-1/4"	8.0	B11-677	
2"	2"	2"	5-45/64"	9.2	B11-778	

▼ Approved to ANSI/NSF Standard 61-2007a.

FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B-62 and ASTM B-584, UNS NO C83600 - 85-5-5-5)
- Add "-NL" to end of catalog number for item to be approved to ANSI/NSF Standard 61 and Annex G (372). "NL" items will be made from UNS/CDA No. C89833 alloy
- Valve is non-directional and is watertight with flow in either direction
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching curb box rod or handle is provided in tee-head
- 300 PSI working pressure

Optional Padlock Wing for locking valve in closed position. Add "W" to part number
Optional full 360° tee-head rotation. Add "R" to part number.

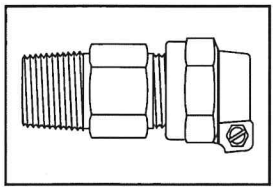
The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

05/14/13

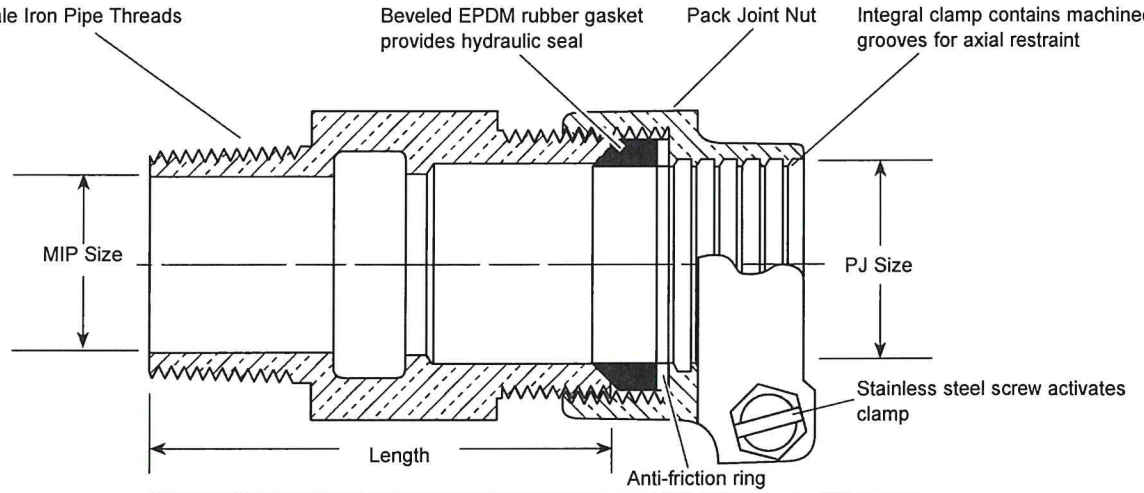
Submitted By:

SUBMITTAL INFORMATION

Pack Joint Coupling - *(C84-xx style)*



MALE IRON PIPE BY PACK JOINT FOR COPPER OR PLASTIC TUBING (CTS)



Description		Length	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
Male Iron Pipe	P.J. for CTS				
1/2"	1/2"	2"	.5	▼ C84-11	
1/2"	5/8"	2-1/16"	.8	▼ C84-12	
1/2"	3/4"	2-1/16"	.8	▼ C84-13	
3/4"	1/2"	2"	.8	▼ C84-31	
3/4"	5/8"	-	.7	▼ C84-32	
3/4"	3/4"	2-1/4"	.6	▼ C84-33	
3/4"	1"	2-3/8"	.7	▼ C84-34	
1"	5/8"	-	-	▼ C84-42	
1"	3/4"	2-3/8"	.7	▼ C84-43	
1"	1"	2-9/16"	.8	▼ C84-44	
1"	1-1/4"	2-1/2"	1.2	C84-45	
1"	1-1/2"	2-9/16"	1.8	C84-46	
1-1/4"	1"	2-9/16"	1.4	C84-54	
1-1/4"	1-1/4"	2-9/16"	1.4	C84-55	
1-1/4"	1-1/2"	3-1/4"	1.8	C84-56	
1-1/2"	1-1/2"	3-1/4"	2.0	C84-66	
1-1/2"	2"	2-15/16"	2.6	C84-67	
2"	2"	3-1/4"	3.1	C84-77	

▼ Approved to ANSI/NSF Standard 61-2007a.
Note: Ford recommends using insert stiffeners with plastic pipe or tubing.

FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B-62 and B-584, UNS NO C83600 - 85-5-5-5)
- Add "-NL" to end of catalog number for item to be approved to ANSI/NSF Standard 61 and Annex G (372). "NL" items will be made from UNS/CDA No. C89833 alloy.
- Body design provides larger, more rugged wrench flats for proper installation

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02/05/13

Submitted By: