## Section A: Pipe

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### A 1 – PVC PIPE - SCHEDULE 40:

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<tr>
<th>Effective Date: 01-01-20</th>
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<tbody>
<tr>
<td>Revision #: 2</td>
</tr>
</tbody>
</table>

**MATERIAL/ SPECIFICATION:**
Schedule 40 Polyvinyl Chloride, PVC, Pipe shall meet or exceed the performance specifications of:

- ASTM D1785, dimensional requirements, minimum burst and sustained pressure requirements, maximum operating pressure, and test procedures for determining pipe quality with respect to workmanship and materials.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw”.
- ASTM D1784, manufactured from compounds with Cell Classification 12454B (Type 1, Grade 1 material).

**CONNECTIONS:**
- Plain end X plain end.
- Plain end X solvent weld bell.

**DIMENSIONS:**
- 20’ standard joint length.

**MANUFACTURER:**
- CHARLOTTE PIPE AND FOUNDRY
- COLONIAL
- DIAMOND PLASTICS
- FREEDOM PLASTICS
- NAPCO
- NATIONAL PIPE & PLASTICS
- JM EAGLE
- IPEX
- PIPELIFE

**RESTRICTIONS:**
Use of this product is limited to:
- Sewer service laterals
- 2” Water blow offs
- Water lines
A 2 – PVC PIPE - SCHEDULE 80:

**MATERIAL/ SPECIFICATION:**
Schedule 80 Polyvinyl Chloride, PVC, Pipe shall meet or exceed the performance specifications of:

- ASTM D1785, dimensional requirements, minimum burst and sustained pressure requirements, maximum operating pressure, and test procedures for determining pipe quality with respect to workmanship and materials.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw”.
- ASTM D1784, manufactured from compounds with Cell Classification 12454B (Type 1, Grade 1 material).

**CONNECTION:**
- Plain end X plain end
- Plain end X solvent weld bell

**DIMENSIONS:**
- 20’ standard joint length

**SIZES:**
- 3/4”
- 1”
- 1-1/2”
- 2”

**MANUFACTURER:**
- CHEMTROL
- CHARLOTTE PIPE AND FOUNDRY
- COLONIAL
- ESLON THERMOPLASTICS
- FREEDOM PLASTICS
- NATIONAL PIPE AND PLASTICS
- WORLD OF PLASTICS, INC.
- JM EAGLE
- IPEX
- NORTH AMERICAN PIPE
- PIPELIFE

**RESTRICTIONS:**
- Pump station chemical feed applications downstream from backflow preventer.
### A 3 – POLYETHYLENE SERVICE TUBING:

<table>
<thead>
<tr>
<th>SPECIFICATION/ MATERIAL:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE-3608 High Density Polyethylene, HDPE, tubing shall meet or exceed the performance specifications of:</td>
</tr>
<tr>
<td>• PE-3608 Resin listed in Plastic Pipe Institute TR4 Cell classification per ASTM Standards D3350 = 345444 or 345464.</td>
</tr>
<tr>
<td>• ASTM Standards D2737 dimensional standard, Copper Tubing Size, CTS, controlled outside diameter.</td>
</tr>
<tr>
<td>• AWWA C901</td>
</tr>
<tr>
<td>• MFG. Shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements for pipe in this classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POTABLE WATER REQUIREMENT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw”.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRESSURE RATING:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 200-psi operating pressure @ 73.4 F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COLOR-CODED:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blue - potable water</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIMENSIONS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Copper tubing size, C.T.S. O.D. controlled</td>
</tr>
<tr>
<td>• DR-9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1&quot;</td>
</tr>
<tr>
<td>• 2&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MANUFACTURER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• DURA-LINE PW TUBING</td>
</tr>
<tr>
<td>• ADS</td>
</tr>
<tr>
<td>• CHARTER PLASTICS</td>
</tr>
<tr>
<td>• ENDOT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESTRICTIONS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of this product is limited to:</td>
</tr>
<tr>
<td>• Water service lines</td>
</tr>
</tbody>
</table>
# A 3.1 – POLYETHYLENE 2” POTABLE WATER MAIN TUBING:

**SPECIFICATION/MATERIAL:**
Pe-3608 High Density Polyethylene, HDPE, tubing shall meet or exceed the performance specifications of:

- PE-3608 Resin listed in Plastic Pipe Institute TR4
- Cell classification per ASTM Standards D3350 = 345444 or 345464E.
- ASTM Standards D3035 dimensional standard, Iron Pipe Size, IPS, controlled outside diameter.
- AWWA C901
- MFG. Shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements for pipe in this classification.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSFpw”.

**PRESSURE RATING:**
- 200-psi. operating pressure @ 73.4 °F

**COLOR-CODED:**
- Blue - potable water
- Black with minimum of three (3) evenly spaced blue stripes - potable water

**DIMENSIONS:**
- Iron pipe size, I.P.S. O.D. controlled
- DR-9

**SIZES:**
- 2”

**MANUFACTURER:**
- CHARTER PLASTICS/BLUE STRIPE PIPE
- ENDOPURE/ BLUE WITH CLEAR CORE
- LAMSON VYLON/ PRESSURE FLEX WATER
- ADS

**RESTRICTIONS:**
Use of this product is limited to:
- 2” potable water mains
**A 3.2 – HIGH DENSITY POLYETHYLENE PIPE (HDPE) 4"-36":**

<table>
<thead>
<tr>
<th>MATERIAL / SPECIFICATION:</th>
<th>Effective Date: 01-01-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE-4710 High Density Polyethylene, HDPE, pipe shall meet or exceed the performance specifications of:</td>
<td>Revision #: 2</td>
</tr>
<tr>
<td>• PE-4710 Resin listed in Plastic Pipe Institute TR4.</td>
<td></td>
</tr>
<tr>
<td>• Cell classification per ASTM D3350 = 345444C or 345464C for black OR 345444E or 345464E for non-black &amp; color.</td>
<td></td>
</tr>
<tr>
<td>• ASTM F 714, minimum wall values.</td>
<td></td>
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<tr>
<td>• AWWA C906.</td>
<td></td>
</tr>
<tr>
<td>• MFG. Shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements for pipe in this classification.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>POTABLE WATER REQUIREMENTS:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw”.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COLOR– CODED:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blue - potable water.</td>
<td></td>
</tr>
<tr>
<td>• Green - sanitary sewer/ force main.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>DIMENSIONS:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ductile iron pipe size O.D., D.I.P.S.</td>
<td></td>
</tr>
<tr>
<td>• DR-11, DR-13.5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRESSURE RATING:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 200-psi. operating pressure @ 73.4 F for DR-11.</td>
<td></td>
</tr>
<tr>
<td>• 160-psi. operating pressure @ 73.4 F for DR-13.5</td>
<td></td>
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<table>
<thead>
<tr>
<th>JOINING RESTRICTIONS:</th>
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<tbody>
<tr>
<td>• Compression type connections are not acceptable in new installations.</td>
<td></td>
</tr>
<tr>
<td>• Pipe joints shall be butt fusion.</td>
<td></td>
</tr>
<tr>
<td>• No electro fusion coupling joints will be accepted.</td>
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<tr>
<td>• Flange or mechanical joint adapters shall be used for pipe and fitting transitions.</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>FIRE MAIN PRESSURE RATING &amp; REQUIREMENTS:</th>
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<tr>
<td>• Dimension Ratio (DR) DR-11, pressure class 200 for fire mains.</td>
<td></td>
</tr>
<tr>
<td>• Factory Mutual Approved (FM) pipe.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>MANUFACTURER:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• CHARTER PLASTICS/ STRIPE PIPE</td>
<td></td>
</tr>
<tr>
<td>• CP CHEMICAL</td>
<td></td>
</tr>
<tr>
<td>• PERFORMANCE PIPE DRISCOPLEX</td>
<td></td>
</tr>
<tr>
<td>• FLYING W PLASTICS</td>
<td></td>
</tr>
<tr>
<td>• JM EAGLE PE PIPE</td>
<td></td>
</tr>
<tr>
<td>• LAMSON VYLON/ PRESSURE FLEX WATER</td>
<td></td>
</tr>
<tr>
<td>• RINKER MATERIALS– POLY PIPE</td>
<td></td>
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<tr>
<td>• WL PLASTICS</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>RESTRICTIONS:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• DR-13.5 considered for mains 6” and larger when hydraulic or availability restrictions apply. Submittal to and approval by CFPUA required.</td>
<td></td>
</tr>
</tbody>
</table>
### Material Specification: 2" SDR 21 Polyvinyl Chloride, PVC, Pipe

Pipe shall meet or exceed the performance specifications of:

- ASTM D2241 or latest revision thereof.
- ASTM D1784, manufactured from compounds with cell classification 12454B.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw”.
- Push-on integral bell type supplied with elastomeric gaskets installed.
- Joints per ASTM D3139 testing requirements.
- Gaskets per ASTM F477.
- Pipe shall be clean and ends shall be tarped during shipment.
- Standard Dimension Ratio (SDR) 21.
- No solvent-cement weld pipe or fittings will be accepted.

### Pressure Rating:

- 200 psi. at 23 Degrees C (73.4 Degrees F)

### Color-Coded:

- Blue - potable water

### Dimensions:

- Iron pipe size (IPS) Outside diameter controlled
- 20’ and 21’ standard joint length

### Manufacturer:

- CHARLOTTE PIPE AND FOUNDRY
- DIAMOND PLASTICS
- FREEDOM PLASTICS
- JM EAGLE
- NAPCO
- NATIONAL PIPE & PLASTICS
- PIPELIFE

### Restrictions:

Use of this product limited to:

- 2” Water Mains
### MATERIAL/ SPECIFICATION:
AWWA C-900 Polyvinyl Chloride, PVC, Pipe shall meet or exceed the performance specifications of:

- ASTM D1784, manufactured from compounds with cell classification 12454A or 12454B.
- Push-on integral bell type joints per ASTM D3139 testing requirements, supplied with elastomeric gaskets installed.
- Gaskets per ASTM F477.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw”.
- Pipe shall be clean and ends shall be tarped during shipment.
- No solvent-cement weld pipe or fittings will be accepted.
- Affidavit of compliance to this specification shall be available upon request.

### COLOR– CODED:
- Blue - potable water

### DIMENSIONS:
- Ductile iron pipe size O.D., D.I.P.S.
- DR-18, DR-14
- 20’ standard joint length

### PRESSURE RATING:
- 235-psi. operating pressure @ 73 F for DR-18.
- 305-psi. operating pressure @ 73 F for DR-14.

### FIRE MAIN PRESSURE RATING & REQUIREMENTS:
- Dimension Ratio (DR) 14, pressure class 200 for fire mains.
- Factory Mutual Approved (FM) and Underwriter Laboratory Listed (UL) as noted by (UL/FM) required on DR 14 pipe.
- No solvent-cement weld pipe or fittings will be accepted.

### MANUFACTURER:
- DIAMOND PLASTICS
- FREEDOM PLASTICS
- JM EAGLE/ BLUE BRUTE
- NAPCO
- NATIONAL PIPE & PLASTICS
- PIPELIFE

### RESTRICTIONS:
- DR-14 is a design option for special installations. CFPUA approval required.
### A 5.1 – PVC PIPE (AWWA C-900) - SEWER (4” THRU 24”):

#### MATERIAL/ SPECIFICATION:
AWWA C-900 Polyvinyl Chloride, PVC, Pipe shall meet or exceed the performance specifications of:

- ASTM D1784, manufactured from compounds with cell classification 12454A or 12454B.
- Push-on integral bell type joints per ASTM D3139 testing requirements, supplied with elastomeric gaskets installed.
- Gaskets per ASTM F477
- Pigment stabilizers and ultraviolet inhibitors shall be used to prevent fading for a period of six (6) months after delivery.
- Pipe shall be clean and ends shall be tarped during shipment.
- No solvent-cement weld pipe or fittings will be accepted.
- Affidavit of compliance to this specification shall be available upon request.

#### COLOR– CODED:
- Green - sanitary sewer

#### DIMENSIONS:
- Ductile iron pipe size O.D., D.I.P.S.
- DR-18, DR-14
- 20’ standard joint length
- Shorter joints acceptable for sewer only

#### PRESSURE RATING:
- 235-psi. operating pressure @ 73 F for DR-18.
- 305-psi. operating pressure @ 73 F for DR-14.

#### MANUFACTURER:
- DIAMOND PLASTICS
- FREEDOM PLASTICS
- JM EAGLE/ BLUE BRUTE
- NAPCO
- NATIONAL PIPE & PLASTICS
- PIPELIFE

#### RESTRICTIONS:
- DR-14 is a design option for special installations. CFPUA approval required.
**A 5.2 – PVC PIPE RESTRAINED JOINT PIPE & COUPLINGS (AWWA C-900) (4” THRU 16”):**

**MATERIAL/ SPECIFICATION:**
AWWA C-900. Pipe shall meet or exceed the performance specifications of:

- ASTM D1784, manufactured from compounds with cell classification 12454A or 12454B.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 14, 61 or “NSF-pw” for all blue pipe (potable water installation).
- Joined using separate couplings that have built in sealing gaskets (O-rings) and restraining grooves.
- Shall be joined using high-strength flexible plastic splines inserted into mating precision-machine grooves, which align when the pipe is fully inserted, providing a full 3600 restraint with evenly distributed loading.
- Joints per ASTM D3139 testing requirements.
- Gaskets per ASTM F477.
- Pipe shall be clean and ends shall be tarped during shipment.
- No solvent-cement weld pipe or fittings will be accepted.
- Affidavit of compliance to this specification shall be available upon request.

**COLOR– CODED:**
- Blue— potable water
- Green— sanitary sewer/ force main

**DIMENSIONS:**
- Ductile iron pipe size O.D., D.I.P.S.
- DR-18, DR-14.
- 20’ standard joint length.

**PRESSURE RATING:**
- 235-psi. operating pressure @ 73 F for DR-18.
- 305-psi. operating pressure @ 73 F for DR-14.

**MANUFACTURER:**
- CERTAINTEED– CERTA-LOK
- JM EAGLE LOC 900
- DIAMOND LOK-21

**REstrictions:**
- Only for low profile carrier pipes inside casings with prior approval by CFPUA.
- DR-14 is a design option for special installations. CFPUA approval required.
### A 5.3 – PVC PIPE FUSIBLE (AWWA C-900) - POTABLE WATER (4” THRU 24”):

<table>
<thead>
<tr>
<th>MATERIAL/ SPECIFICATION:</th>
<th>PRESSURE RATING:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fusible AWWA C-900 Polyvinyl Chloride, PVC, Pipe shall meet or exceed the performance specifications of:</td>
<td>• 235-psi. operating pressure @ 73 F for DR-18.</td>
</tr>
<tr>
<td>• ASTM D1784, manufactured from compounds with cell classification 12454.</td>
<td>• 305-psi. operating pressure @ 73 F for DR-14.</td>
</tr>
<tr>
<td>• Manufacture shall be listed with the Plastic Pipe Institute (PPI) as meeting the recipe and mixing requirements for pipe in this classification.</td>
<td></td>
</tr>
<tr>
<td>• Extruded with a unique formulation, for fusible pipe, that meets all requirements of PPI TR-2 “PPI PVC Range Composition Listing of Qualified Ingredients”.</td>
<td></td>
</tr>
<tr>
<td>• Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 61 or NSF-pw.</td>
<td></td>
</tr>
<tr>
<td>• Pipe shall be clean and ends shall be tarped during shipment.</td>
<td></td>
</tr>
<tr>
<td>• Pipe shall be extruded with plain ends. The end shall be square to the pipe and free of any bevel or chamfer.</td>
<td></td>
</tr>
<tr>
<td>• Fusible pipe shall be joined per the manufacture’s recommendation.</td>
<td></td>
</tr>
<tr>
<td>• Installation shall not exceed manufacture’s bending radius and safe pulling force.</td>
<td></td>
</tr>
<tr>
<td>• No solvent-cement weld pipe or fittings will be accepted.</td>
<td></td>
</tr>
<tr>
<td>• Affidavit of compliance to this specification shall be available upon request.</td>
<td></td>
</tr>
</tbody>
</table>

### COLOR– CODED:
- Blue - potable water

### DIMENSIONS:
- Ductile iron pipe size O.D., D.I.P.S.
- DR-18 DR-14
- 20’, 30’ or 40’ standard joint length.

### RESTRICTIONS:
- DR-14 is a design option for special installations. CFPUA approval required.

### MANUFACTURER:
- UNDERGROUND SOLUTIONS
**Material Specification Manual**

Section A: Pipe

<table>
<thead>
<tr>
<th>A 5.3.1 – PVC PIPE FUSIBLE (AWWA C-900) - SEWER FORCE MAIN (4” THRU 24”):</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MATERIAL SPECIFICATION:</strong> Fusible AWWA C-900 Polyvinyl Chloride, PVC, Pipe shall meet or exceed the performance specifications of:</td>
</tr>
<tr>
<td>• ASTM D1784, manufactured from compounds with cell classification 12454.</td>
</tr>
<tr>
<td>• Manufacture shall be listed with the Plastic Pipe Institute (PPI) as meeting the recipe and mixing requirements for pipe in this classification.</td>
</tr>
<tr>
<td>• Extruded with a unique formulation, for fusible pipe, that meets all requirements of PPI TR-2 “PPI PVC Range Composition Listing of Qualified Ingredients”.</td>
</tr>
<tr>
<td>• Pipe shall be clean and ends shall be tarped during shipment.</td>
</tr>
<tr>
<td>• Pipe shall be extruded with plain ends. The end shall be square to the pipe and free of any bevel of chamfer.</td>
</tr>
<tr>
<td>• Fusible pipe shall be joined per the manufacture’s recommendation.</td>
</tr>
<tr>
<td>• Installation shall not exceed manufacture’s bending radius and safe pulling force.</td>
</tr>
<tr>
<td>• No solvent-cement weld pipe or fittings will be accepted.</td>
</tr>
<tr>
<td>• Affidavit of compliance to this specification shall be available upon request.</td>
</tr>
<tr>
<td><strong>COLOR CODED:</strong> Green - sewer force main</td>
</tr>
<tr>
<td><strong>DIMENSIONS:</strong> Ductile iron pipe size O.D., D.I.P.S. DR-14, DR-18 20’, 30’ or 40’ standard joint length.</td>
</tr>
<tr>
<td><strong>PRESSURE RATING:</strong> 235-psi. operating pressure @ 73 F for DR-18. 305-psi. operating pressure @ 73 F for DR-14.</td>
</tr>
<tr>
<td><strong>MANUFACTURER:</strong> UNDERGROUND SOLUTIONS</td>
</tr>
<tr>
<td><strong>RESTRICTIONS:</strong> DR-14 is a design option for special installations. CFPUA approval required.</td>
</tr>
</tbody>
</table>

Effective Date: 01-01-20
Revision #: 2
**A 6 – DUCTILE IRON PIPE/ PUSH-ON JOINT/ CLASS 350 (4” THRU 36”):**

**MATERIAL/ SPECIFICATION:**
- Pipe shall conform with AWWA C151 (ANSI-A21.51).
  Additionally, pipe exterior shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of zinc shall be 200 g/m² of pipe surface area. A finishing layer topcoat system shall conform to ISO 8179-1 Ductile iron pipes – External zinc based coating – Part 1: Metallic zinc with finishing layer.
- Gaskets shall be furnished in accordance with AWWA C111 (ANSI–A21.11).
- Pipe supplied must have ISO 9001 or later certification, or poured in a foundry located in the U.S.A.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 61.
- Factory Mutual Approved (FM) and Underwriter Laboratory Listed (UL) as noted by (UL/FM) for sizes four (4”) thru twelve (12”) inch.
- Affidavit of compliance to this specification shall be available upon request.

**DIMENSIONS:**
- 18’ or 20’ standard joint length.

**PRESSURE RATING:**
- Class 350- psi for sizes 4” thru 24” pipe.
- Class 250- psi for sizes 30” thru 36” pipe.

**COATING & LINING:**

**Potable Water:**
- Exterior - AWWA C151 (ANSI-A21.51), per above ISO 8179-1 requirements.
- Interior - AWWA C104 (ANSI-A21.4), cement mortar lining and asphaltic coating.

**Sanitary Sewers and Force Mains:**
- Exterior - AWWA C151 (ANSI21.51) per above ISO 8179-1 requirements.
- Interior - Coated (factory applied) or approved equal with an amine cured novolac epoxy, containing at least 20% by volume of ceramic quartz pigment “PROTECTO 401” or “PERMOX CTF” (40 mils nominal) or polyamine ceramic epoxy containing at least 20% by volume ceramic hollow microspheres “tnemec series 431 permashield pl” (40 mils nominal).
- The inside of the bell socket including a portion of the gasket cavity and a portion of the pipe barrel are also coated with the above products (6” mils nominal, 10 maximum).

**MANUFACTURER:**
- AMERICAN CAST IRON– FASTITE
- McWANE, INC.– TYTON
- US PIPE & FOUNDRY– TYTON

**RESTRICTIONS:**
### A 6.1 – DUCTILE IRON PIPE/ FLANGE JOINT/ MINIMUM CLASS 53:

**MATERIAL/ SPECIFICATION:**
Flange pipe shall meet or exceed the performance specifications of:

- Pipe shall conform with AWWA C151 (ANSI-A21.51).
- Flanges shall conform to the chemical and physical properties specified for ductile iron fittings in ANSI/AWWA C 110/A21.10.
- Shall conform to AWWA C115 (ANSI-A21.15) flange pipe and fitting joints.
- Shall be drilled and faced to conform with ANSI B16.1 Class 125 flanges.

**GASKETS SHALL BE RING OR FULL-FACE TYPE AND PRODUCED FROM ONE OF THE FOLLOWING MATERIALS:**

- EPDM (Ethylene Propylene Diene Monomer)
- Nitrile Buna-N (NBR) (Acrylonitrile Butadiene)
- Viton; Fluorel (FKM) (Fluorocarbon)
- Pipe supplied must have ISO 9001 or later certification, or poured in a foundry located in the U.S.A.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 61.
- Affidavit of compliance to this specification shall be available upon request.

**DIMENSIONS:**
- Ductile iron pipe size O.D., D.I.P.S.
- 18’ or 20’ standard joint length or as specified for project.

**PRESSURE RATING:**
- Class 250-psi. for sizes 4” thru 24” pipe.

**COATING & LINING:**

**Potable Water:**
- Exterior - AWWA C151 (ANSI-A21.51), per above ISO 8179-1 requirements.
- Interior - AWWA C104 (ANSI-A21.4), cement mortar lining and asphaltic coating.

**Sanitary Sewers and Force Mains:**
- Exterior - AWWA C151 (ANSI-A21.51), per above ISO 8179-1 requirements.
- Interior - Coated (factory applied) or approved equal with an amine cured novolac epoxy, containing at least 20% by volume of ceramic quartz pigment “PROTECTO 401” or “PERMOX CTF” (40 mils nominal) or polyamine ceramic epoxy containing at least 20% by volume ceramic hollow microspheres “TNEMEC SERIES 431 PERMA-SHIELD PL” (40 mils nominal).

**MANUFACTURER:**
- AMERICAN CAST IRON
- McWANE, INC.
- US PIPE & FOUNDRY

**RESTRICTIONS:**
- Flange pipe is for use in inside buildings, above ground outside, or inside underground vault or manhole service applications.
**Material Specification Manual**

**Section A: Pipe**

### A 6.2 – Ductile Iron Pipe/ Restrained Push-On Joint/TR Flex Joint (4” thru 36”):

**Effective Date:** 01-01-20  
**Revision #:** 2

<table>
<thead>
<tr>
<th>MATERIAL / SPECIFICATION:</th>
<th>COATING &amp; LINING:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Restrained pipe shall meet or exceed the performance specifications of:</strong></td>
<td><strong>Potable Water:</strong></td>
</tr>
<tr>
<td>• Shall conform with AWWA C150 (ANSI–A21.50) thicknesses and strength.</td>
<td>• Exterior - AWWA C151 (ANSI-A21.51) per above ISO 8179-1 requirements.</td>
</tr>
<tr>
<td>• Shall conform with AWWA C151 (ANSI-A21.51), Additionally, pipe exterior shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of zinc shall be 200 g/m2 of pipe surface area. A finishing layer topcoat shall be applied to the zinc. The zinc coating system shall conform to ISO 8179-1 “Ductile iron pipe – External zinc based coating – Part 1: Metallic zinc with finishing layer.”</td>
<td>• Interior - AWWA C104 (ANSI-A21.4), cement mortar lining and asphaltic coating.</td>
</tr>
<tr>
<td>• Gaskets shall be furnished in accordance with AWWA C111 (ANSI–A21.11).</td>
<td><strong>Sanitary Sewers and Force Mains:</strong></td>
</tr>
<tr>
<td>• Shall use a standard size Tyton gasket.</td>
<td>• Exterior - AWWA C151 (ANSI21.51) per above ISO 8179-1 requirements.</td>
</tr>
<tr>
<td>• Shall use ductile iron locking segments, inserted through a slot (or slots) in the bell face, to provide a positive axial lock between the bell interior surface and a retainer weldment on the spigot end of the pipe.</td>
<td>• Interior - Coated (factory applied) or approved equal with an amine cured novolac epoxy, containing at least 20% by volume of ceramic quartz pigment “PROTECTO 401” or “PERMOX CTF” (40 mils nominal) or polyamine ceramic epoxy containing at least 20% by volume ceramic hollow microspheres “TNEMEC SERIES 431 PERMA-SHIELD PL” (40 mils nominal).</td>
</tr>
<tr>
<td>• Pipe supplied must have ISO 9001 or later certification, or poured in a foundry located in the U.S.A.</td>
<td><strong>PRESSURE RATING:</strong></td>
</tr>
<tr>
<td>• Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 61.</td>
<td>• Class 350-psi. for sizes 4” thru 24” pipe.</td>
</tr>
<tr>
<td>• Factory Mutual Approved (FM) and Underwriter Laboratory Listed (UL) as noted by (UL/FM) for sizes four (4”) thru twelve (12”) inch.</td>
<td>• Class 250-psi. for sizes 30” thru 36” pipe.</td>
</tr>
<tr>
<td>• Affidavit of compliance to this specification shall be available upon request.</td>
<td><strong>DIMENSIONS:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Restrictions:</strong></th>
</tr>
</thead>
</table>

- Ductile iron pipe size O.D., D.I.P.S.
- 18’ or 20’ standard joint length.

### MANUFACTURER:

- US PIPE & FOUNDRY– TR FLEX
- McWANE, INC.– TR FLEX

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**Cape Fear Public Utility Authority**
**Material Specification: Ductile Iron Pipe/Restrained Push-On Joint/Flex-Ring Joint (4” thru 48”):**

**Effective Date:** 01-01-20  
**Revision #:** 2

**MATERIAL/SPECIFICATION:**  
Restrained pipe shall meet or exceed the performance specifications of:

- Shall conform with AWWA C150 (ANSI-A21.50) thicknesses and strength.
- Shall conform with AWWA C151 (ANSI-A21.51), Additionally, pipe exterior shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of zinc shall be 200 g/m² of pipe surface area. A finishing layer topcoat shall be applied to the zinc. The zinc coating system shall conform to ISO 8179-1- Ductile iron pipe – External zinc based coating – Part 1: Metallic zinc with finishing layer.
- Gaskets shall be furnished in accordance with AWWA C111 (ANSI-A21.11).
- Shall use a standard size Fastite gasket.
- Pipe supplied must have ISO 9001 or later certification, or poured in a foundry located in the U.S.A.
- Shall comply with and be labeled as approved by the National Sanitation Foundation (NSF) for use in potable water lines meeting NSF 61.
- Factory Mutual Approved (FM) and Underwriter Laboratory Listed (UL) as noted by (UL/FM) for sizes four (4”) thru twelve (12”) inch.
  - Affidavit of compliance to this specification shall be available upon request.

**PRESSURE RATING:**  
- Class 350-psi. for sizes 4” thru 24” pipe.
- Class 250-psi. for sizes 30” thru 36” pipe.

**DIMENSIONS:**  
- Ductile iron pipe size O.D., D.I.P.S.
- 18’ or 20’ standard joint length.

**ADDITIONAL INFORMATION:**  
- Standard Flex-Ring segments are yellow.
- Field Flex-Ring segments are black.

**COATING & LINING:**  
**Potable Water:**
- Exterior - AWWA C151 (ANSI-A21.51) per above ISO 8179-1 requirements.
- Interior - AWWA C104 (ANSI-A21.4), cement mortar lining and asphaltic coating.

**Sanitary Sewers and Force Mains:**  
- Exterior - AWWA C151 (ANSIA21.51) per above ISO 8179-1 requirements.
- Interior - Coated (factory applied) or approved equal with an amine cured novolac epoxy, containing at least 20% by volume of ceramic quartz pigment “PROTECTO 401” or “PERMOX CTF” (40 mils nominal) or polyamine ceramic epoxy containing at least 20% by volume ceramic hollow microspheres “TNEMEC SERIES 431 PERMA-SHIELD PL” (40 mils nominal).

**MANUFACTURER:**  
- AMERICAN CAST IRON– FLEX-RING
A 7 – STAINLESS STEEL PIPE:

MATERIAL/ SPECIFICATION:
- Schedule 40, 316 stainless steel pipe.
- Specifications shall conform to ANSI/ASME 36.19.

CONNECTIONS:
- Pipe shall have NPT threads on both ends and a coupling on one end making a full joint, mipt X fipt. As required on detail drawings.

DIMENSIONS:
- 21’ standard joint length.

MANUFACTURER:
- OPEN

RESTRICTIONS:
- This material is required for air/vacuum release valve piping or other special uses as noted on detail drawings.
**A 8 – GALVANIZED PIPE (TEMPORARY):**

**MATERIAL/ SPECIFICATION:**
- Schedule 40, galvanized steel pipe.
- Specifications shall conform to ASTM A-53 grade-A or latest revision thereof.

**CONNECTIONS:**
- Pipe shall have NPT threads on both ends and a coupling on one end making a full joint, mipt X fipt.

**DIMENSIONS:**
- 21’ standard joint length.

**MANUFACTURER:**
- OPEN

**RESTRICTIONS:**
- This material is only used for temporary sampling and flushing points during pipeline construction.
- Galvanized pipe is not acceptable for any other use.