

# City of Joliet Department of Public Utilities Approved Materials List



## Water System

### 1. Ductile Iron Pipe

- A. Ductile iron pipe complying with AWWA C151/ANSI A21.51, thickness Class 52, with joints complying with AWWA C111/ANSI A21.11. Use cement lining complying with AWWA C104/ANSI A21.4, standard thickness. Provide exterior zinc coating in accordance with ISO 8179-1.
- B. Restrained joint system shall be Meg-A-Lug.
- C. Serrated silicon bronze wedges, two per joint for pipes 12 inches or smaller, four per joint for pipe for pipes larger than 12 inches.
- D. Polyethylene encasement meeting AWWA C105 with three layers of co-extruded linear low density polyethylene film fused into one with the inside surface infused with a blend of anti-microbial additive to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
  - 1. In the event that polywrap is observed to not be properly installed on ductile iron pipe, the contractor will be required to take photos of all installed ductile iron pipe to verify that polywrap is properly installed. Photos shall be provided (within "ESRI Field Apps" application) as outlined in the GIS section of the Design Manual.

### 2. PVC Pipe

- A. PVC conforming to AWWA C900 with rubber-ring gasket bell end or plain end with elastomeric gasket coupling, cast iron equivalent outside diameter, material cell classification 12454 per ASTM D1784. Class 235 pressure pipe with standard dimension ratio of 18.
- B. Use push-on bell and spigot type joints with elastomeric ring configuration to ASTM F-477.
- C. Size range is 4 through 12 inches. Water main 16 inches and larger to be ductile iron pipe.
- D. PVC is not for use near gas stations or other sites which may have hydrocarbon contamination. Environmental Site Assessments completed by a certified environmental independent consultant may be required in areas of questionable soil characteristics. The Director of Public Utilities shall have the final determination on allowing the use of PVC C900 DR 18 for potable water mains.
- E. All potable water pipe and fittings installed shall be color coded as required by FAC Rule 62-555.320(21)(b)3, using blue as a predominant color to differentiate drinking water from reclaimed or other water. Underground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin.
- F. All PVC pipe used shall be of new or manufactured within the last 2 years. Pipe with surface discoloration will not be allowed.
- G. All fire hydrant leads shall be ductile iron wrapped in polywrap meeting the requirements of 1.D.

### 3. PVC Restrained Joint Pipe

- A. Mechanical joint retainer gland systems that provide locking segments shaped to pipe barrel that do not create stress points on pipe barrel.
- B. Acceptable products for pipes:
  - 1. a. Meg-A-Lug System.
    - a. Series 2000PV Megalug for MJ to Pipe (C900).
    - b. Series 1500 Megalug Harness for push on joint (C900).
    - c. As recommended by manufacturer for connection to existing pipes and approved by the City

### 4. Fittings

- C. Provide mechanical joints complying with AWWA C110/ANSI A21.10 or AWWA C153/A21.53.
  - 1. Cement lining: Comply with AWWA C104/ANSI A-21.4, standard thickness.
  - 2. Bolts and nuts:
    - a. Use A-304 stainless steel bolts with nuts and washers of series 300 stainless steel per ASTM A194.
    - b. Sac Nuts: Duratron Sac Nuts or approved equal.
      - i. One sac nut per fitting.
  - 3. Mechanical joint restraint shall be Meg-A-Lug System.
  - 4. No concrete thrust blocks are allowed, except as directed by City Engineer.

### 5. Gate Valves (14" Diameter and Less)

- A. Design in accordance with AWWA C509 (cast iron body), or AWWA C515 (ductile iron body), bronze fitted, resilient wedge and seat type with non-rising stem and O-ring packing with 2" square operating nut.
- B. Use A-304 stainless steel bolts with nuts and washers of series 300 stainless steel per ASTM A194.
- C. All internal and external surfaces shall have a fusion bonded epoxy coating.
- D. Acceptable valve manufacturers:
  - 1. American Flow Control.
  - 2. Clow.
  - 3. EJ.

### 6. Butterfly Valves (16" Diameter and Greater)

- A. Design in accordance with AWWA C504 for pressure Class 150B, cast iron body, rubber-seated, tight closing type suitable for buried service. Provide worm gear operator with 2" square operating nut.
- B. Use A-304 stainless steel bolts with nuts and washers of series 300 stainless steel per ASTM A194.
- C. Acceptable valve manufacturers:
  - 1. American Flow Control.
  - 2. Clow.
  - 3. EJ.

## 7. Insertion Valves

- A. Design in accordance with AWWA C515 epoxy coated split body, resilient wedge or seat type with O-ring seal stuffing, rated for 250 psi working pressure.
- B. Acceptable valve manufacturers:
  - 1. Hydra-Stop Insta-Valve IVP 250.
  - 2. Advanced Valve Technologies EZ2 Valve.

## 8. Valve Vaults

- A. Provide 4' diameter vaults for valves 10" and less. Provide 5' diameter vaults for valves 12" and larger.
- B. Provide pre-cast concrete structure with EJ 1050Z1 or Neenah R1710 frame.
- C. "WATER" and "CITY OF JOLIET" shall be cast into the lid.
- D. Install Henry Company, RN103- RAM-NEK Preformed Flexible Gasket (Coils) or ConSeal Concrete Sealants, Inc., Type CS-102 at all joints.
- E. Valve vaults shall be concentric for gate valves and eccentric for butterfly valves.
- F. Flexible pipe connectors:
  - 1. Provide flexible rubber gasket collar for connecting pipe to the manhole. Comply with ASTM C923. For pipe 24-inch and smaller, use PSX gasket system by Press-Seal Gasket Corporation, or equal. For pipe 27-inch and larger, use resilient gasket by A-LOK Products, Inc., or equal.
- G.

## 9. Valve Boxes

- A. American made adjustable valve boxes with "WATER" cast into lid.
- B. Provide stainless steel extension stems for water mains deeper than 6'.
- C. Acceptable Manufacturers:
  - 1. EJ Series 8550
  - 2. Tyler 6850 Series
- D. Valve box stabilizer:
  - 1. Alberico.
  - 2. American.
  - 3. Adaptor, Inc.
  - 4. Or equal.

## 10. Fire Hydrants

- A. Design in accordance with AWWA C502 (Dry Barrel)
- B. Provide compression type with a 5¼-inch minimum size main valve assembly, O-ring seals, two 2½-inch hose nozzles, and a 4½-inch pumper nozzle with National Standard threads, a National Standard operating nut, and an above ground break flange.
- C. Color for hydrants on potable distribution mains shall be red, hydrants on raw water mains shall be green. Color for private system hydrants shall be yellow.
- D. Maximum spacing for fire hydrants shall be 300 feet.
- E. Acceptable manufacturers:
  - 1. EJ 5BR250.
  - 2. Clow Medallion.
  - 3. Mueller Centurion A423

- F. Provide red color above ground access for tracer wire systems (for PVC water mains only).
  - 1. Acceptable manufacturers:
    - a. Copperhead Industries Cobra Hydrant Flange Package Part #T1-FLPKG
    - b. Or approved equal

#### 11. Tapping Sleeve

- A. Use two-piece bolted sleeve ductile iron or stainless steel type with mechanical joints. Provide joint accessories.
- B. The City of Joliet Water Department shall be responsible for completing all taps to existing water mains. Contractor will be responsible for calling 815-724-4220 to schedule an appointment with the City Water Department. Appointments are available on Tuesdays and Thursdays.
- C. Acceptable manufacturers:
  - 1. Clow F5205
  - 2. Smith Blair 665
  - 3. Cascade CST-EX
  - 4. Or approved equal.

#### 12. Water Service

- A. Service size 2" or less shall be Type "K" copper, installed as one continuous piece from main to curb stop. Service size 4" and larger shall be ductile iron.
- B. Service saddle required for services larger than 1" on ductile iron: Mueller DR2A.
- C. Service saddle required for all PVC connections: Mueller DR2A.
- D. Taps on PVC water main shall be no closer than 2 feet.
- E. Corporation stop: A.Y. McDonald 74701 BQ.
- F. Curb stop: A.Y. McDonald 76104Q.
- G. Service box: Tyler 6500 with BBAF valve box stabilizer.

#### 13. Underground Location for PVC Water Main

- A. Wire: Single Strand, single conductor, copper-clad steel, No. 12 AWG high strength, high carbon with min. 450 lb. break load, min. 30 mil. HDPE insulation thickness (1230B-HS) for direct bury installation; color coded per APWA Standards.
  - 1. Acceptable manufacturers:
    - a. Copperhead Complete Utility Locating System
    - b. Or approved equal.
  - 2.
- B. Connectors:
  - 1. Single use locking three-way locking connectors, Copperhead LSC1230C or approved equal
  - 2. Mainline to service connectors to include dielectric silicon sealant, Copperhead 3WB-01 or approved equal
- C. Provide 1.5 pound magnesium grounding anodes and 12-AWG wire.

- D. Tracer wire test station: Provide for a direct connection to the tracer wire by utility locate transmitter manufactured for the application location; Identified with (green color coded cap or "WATER" on the cap and color coded) per APWA Standards; Two terminal tracer wires to include a manually interruptible conductive/connective link between the terminal for the tracer wire connection and the terminal for the ground rod wire connection; External direct connection points to both tracer wire and ground rod on top of lid; Encapsulated magnet molded into the top portion of the box for detection by ferrous metal locator; Anti-corrosion wax/gel to protect wires.
1. Acceptable manufacturers:
    - a. Copperhead SnakePit Lite Duty XL or Concrete/Driveway Access Point.
    - b. Or approved equal
14. Pipe marking tape:
- A. Provide tape labeled with message that indicates what type of pipe is below, such as "Caution –Buried Water Line Below".
1. Materials (Detectable):
    - a. Provide solid color, organic virgin polyethylene film with a 0.00035" solid aluminum foil core, with clear film reverse printed and laminated to aluminum foil.
    - b. Thickness: 5.0 mil.                      ASTM D2103
    - c. Tensile strength:15,000 psi    ASTM D882
    - d. Elongation:80%                                 ASTM D882-75B
    - e. Adhesives:AV1257/CA1001
    - f. Colors: APWA code for sewer and water
    - g. Printability:45 Dynes   ASTM D2578
    - h. Width:6.0 inches
  2. Acceptable manufacturers:
    - a. Pro-Line Safety Products by Pro-Line Safety Product Company
    - b. Or approved equal.

### **Sanitary Sewer System**

1. Gravity Sewer
  - A. For sewers less than 24-inch diameter and for depths up to 18 feet, provide SDR 26 PVC sewer pipe :
    1. 4-inch through 15-inch: Comply with ASTM D3034, SDR 26. Use elastomeric gasket type (ASTM F477 and ASTM D3212). Gaskets for fittings and joints: provide minimum cross-sectional area of 0.20 square inches (ASTM F477).
    2. 18-inch through 24-inch: Comply with ASTM F679, PS-115. Use integral bell gasketed type joints with elastomeric gaskets (ASTM F477 or ASTM D3212).
    3. Branch fittings: factory fabricated type with attached main line coupling. SDR 26.
    4. Risers and service pipe and fittings: SDR 26, solid wall type (ASTM D3034).
  - B. For sewers less than 24-inch diameter and for depths greater than 18 feet and less than 25 feet, provide SDR 21 PVC sewer pipe:

1. Comply with ASTM D2241, SDR 21.
  2. Use push-on bell and spigot type, or Certa-Lok spline-lock system, with rubber ring seal gasket (ASTM D3139).
  3. Branch fittings: Factory fabricated type with attached main line coupling, with same rating as pipe.
  4. Risers and service pipe and fittings: ASTM D2241, SDR 21.
- C. For sewers less than 24-inch diameter and for depths from 25 to 30 feet, provide C900 PVC DR 18 PVC pipe:
1. Use push-on bell and spigot type, or Certa-Lok spline-lock system, with rubber ring seal gasket (ASTM D3139).
  2. Branch fittings: Factory fabricated type with attached main line coupling, with same rating as pipe.
  3. Risers and service pipe and fittings: C900 DR 18 PVC until depth of 18 feet, then SDR 26 PVC Sewer pipe.
- D. For sewers greater than 24-inch diameter, use reinforced concrete pipe (RCP):
1. Comply with ASTM C76, Class V.
  2. Use rubber gasket with steel bell and spigots (ASTM C361 and AWWA 302); HK Hamilton Kent of Canada Limited or equal.
  3. No lifting holes allowed in pipe.
- E. Fiberglass reinforced polyester pipe (FRP) and centrifugally cut fiberglass reinforced polymer mortar pipe (CCFRPM):
1. Only to be used with City approval for large diameter sewers.
  2. Materials:
    - a. Resin system: polyester.
    - b. Glass reinforcement: Grade E-glass filaments.
    - c. Sand: 98 percent silica with maximum moisture content of 0.20 percent.
  3. Manufacture:
    - a. Comply with ASTM D3262.
    - b. Thickness: Comply with manufacturer's recommendations.
    - c. Stiffness: Minimum 46 psi when tested in accordance with ASTM D2412.
  4. Joints:
    - a. Fiberglass sleeve couplings.
    - b. Bell and spigot.
    - c. Elastomeric gaskets complying with ASTM F477. Joints complying with ASTM D4161.
    - d. Acceptable manufacturers: Hobas Pipe USA, Inc., no substitutions.
- F. For water main crossings, provide pressure rated PVC pipe:
1. PVC pressure pipe: Use Type I, Grade 1, PVC complying with ASTM D1784. Comply with ASTM D2241 for 160 psi pressure rated pipe, SDR 26. Use push-on bell and spigot type, or Certa-Lok spline-lock system, with rubber ring seal gasket (ASTM D3139).
    - a. Branch fittings: Factory fabricated type with attached main line coupling, with same rating as pipe.
    - b. Risers and service pipe and fittings: ASTM D2241, 160 psi pressure pipe, SDR 26.
    - c. Adapters: use adapters specifically made for purpose of changing from PVC pressure to PVC gravity pipe. Harco or approved equal.

- G. Couplings:
  - 1. Provide flexible rubber couplings with adjustable stainless steel bands and shear ring complying with ASTM C425 or ASTM C1173 for connecting new pipe to existing sewer pipe and for repairing sewer pipe.
    - a. Acceptable Manufacturer: Mission Rubber Company, LLC.

2. Force Mains:

- A. High density polyethylene extruded pipe (HDPE):
  - 1. Comply with ASTM F714 for sewer pipe, Type III, Class C, Category 5, P34 material as per ASTM D3350.
  - 2. Minimum cell classification 345464C.
  - 3. Minimum thickness DR 11.
  - 4. Black or green striped pipe.
  - 5. Pipe joining: use only personnel certified by pipe manufacturer as thermal butt-fusion technicians. Provide equipment and procedures in strict accordance with manufacturer's recommendations.
- B. Provide tracer wire with marker post a minimum of every 500 feet along force main route at the nearest right-of-way line.
  - 1. Tracer wire shall be cable manufactured specifically for utility location/electronic tracing consisting of a composite of a copper conductor; corrosion resistant jackets/coverings; internal wrappings with synthetic materials; and an outer plastic jacket. Tracer wire shall be NEPTCO Tracesafe, or equal.
  - 2. Marker post shall be Nordic Fiberglass, Inc. Warren MN, Model Number P-50-MG-P-52, or equal.
    - a. Label shall read "UNDERGROUND BURIED SANITARY FORCE MAIN IN AREA – CITY OF JOLIET".
- C. Air release/vacuum valves:
  - 1. Provide stainless steel body and cover, stainless steel float, stainless steel seat or Buna-N needles, and integral flanged inlet sized as shown on the Drawings.
    - a. Include back-flushing hose, ½-inch shut-off valve, 1-inch blow-off valve, and quick disconnect couplings.
    - b. All bolts, valves, fittings and piping to be stainless steel.
  - 2. Acceptable products:
    - a. APCO Series ASU
    - b. ARI Model D-020 metal/metal
    - c. Or equal.
- D. Force main discharge manhole:
  - 1. Provide polymer concrete manhole sections, monolithic base sections and related components complying to ASTM C478.
  - 2. Acceptable manufacturer:
    - a. U.S. Composite Pipe

### 3. Manholes:

- A. Provide pre-cast concrete structure conforming to ASTM C478 with EJ 1050Z1 frame.
  - 1. "SANITARY" and "CITY OF JOLIET" shall be cast into the lid.
- B. Pipe connections: Flexible synthetic rubber boots meeting ASTM C-923
- C. Manhole diameter shall be determined by sewer outside diameter, relative angles of sewers to each other, the size of holes cored for flexible pipe "boot" connector and a minimum of 8" between cored/cast holes. Refer to Design Manual for manhole sizing.
- D. External frame seal on all new manholes shall conform to conform to ASTM C923: Infi-Shield Uni-Band or WrapidSeal CANUSA.
- E. Manhole exterior joint protection: MacWrap
- F. Manhole exterior surface treatment: Con-Seal CS-55.
- G. Manhole interior protection system where indicated: Sherwin Williams DuraPlate 6100 or Raven 405.
- H. Grade rings: Precast Concrete
  - 1. Maximum of two rings
  - 2. Total height shall not exceed 12"
  - 3. For manholes installed in pavement, one rubber composite adjustment ring shall be provided: EJ Infra-riser or approved equal

### 4. Sewer System Rehabilitation

- A. Cured-In-Place-Pipelining: Insituform, Inliner USA, National Liner or an approved equal.
  - 1. Design shall comply with ASTM F-1216.
  - 2. End Seal: "Insignia" as manufactured by LMK or equivalent
- B. For CIPP installations greater than 24-inch diameter, temperature sensor cable with a minimum reading of every 5' shall be used to ensure proper curing.
- C. Manhole Patching Material: Strong Seal QSR; Quadex Hyperform; or pre-approved equal.
- D. Cementitious Manhole Sealing: Strong Seal High Performance Mix; or approved equal.
- E. Visible Infiltration: Strong-Plug; Quadex Quad-Plug; or approved equal.
- F. Internal chimney frame seal allowed only on existing manholes as indicated on plans: Raven 581 or SSI Flex-Seal
- G. Couplings for CIPP and Service Connections to CIPP:
  - 1. Provide flexible rubber couplings with adjustable stainless steel bands and shear ring complying with ASTM C425 or ASTM C1173 for connecting new pipe to cured-in-place sewer pipe and for repairing cured-in-place sewer pipe.
    - a. Acceptable Manufacturer: Mission Rubber Company, LLC (Distributed by LMK Technologies, LLC.)
  - 2. LMT Service saddle required for connecting new sewer service connections to mainline cured-in-place sewer pipe. (Distributed by LMK Technologies, LLC.)