SP-156180
(New)

SPECIAL PROVISIONS
FOR
WATER MAIN

Johnson County
STP-U-3715(666)--70-52

Effective Date
March 16, 2021

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

156180.01 SPECIAL REQUIREMENTS.

A. Testing shall not commence until all components are installed (including tracing system), and the as-built and material list are submitted to the Engineer. Testing (including tracing) should be completed within 2 weeks for each segment of water main installed. Segments will be no more than 1200 feet in length. Each segment will take approximately 1 week to complete bacteriological and pressure testing. The testing will likely occur over eight to ten segments sequentially.

B. All testing and system operations will be performed by the Contracting Authority.

C. PVC pipe shall only be used on water mains 10 inch diameter and less.

D. Prestressed concrete cylinder pipe will not be permitted unless approved by the Engineer.

E. Reuse of materials is not allowed unless approved by the Engineer. The Contracting Authority accepts no fault for any issues caused by, or related to, the reuse of any material.

F. The Contracting Authority maintains salvage rights to all fire hydrants designated as public.

G. Samples of water main and its appurtenances may also be retained by the Contracting Authority for testing purposes.

H. Flushing devices (blowoffs) shall only be used on a temporary basis as approved by the Engineer.

I. The City of Iowa City Water Division, Accepted Products for Water Distribution Materials, should be followed for all water mains and appurtenances. This document is attached at the end of this Special Provision.

156180.02 STANDARD SPECIFICATION REVISIONS.

Make the following revisions to the Standard Specifications:

4150.02 PIPE AND FITTINGS.

A. Water Main.

1. Polyvinyl Chloride Pipe

a. Minimum Wall Thickness.

1) (REPLACE) 4 inch through 10 inch sizes: DR 18

2) (DELETE) ~~Sizes over 24 inch: As specified in the contract documents.~~

2. Ductile Iron Pipe.

a. Minimum Thickness Class.

1) (ADD) Restrained Joints: Special thickness Class 53 according to AWWA C151.

B. Bolts for Water Main and Fittings.

2. Other Bolts and Nuts.

b. (DELETE) ~~Ductile iron.~~

c. (DELETE) ~~Zinc, zinc chromate, or cadmium plated.~~

C. Fittings.

1. DIP and PVC Pipe.

b. Joint Type.

1) (DELETE) ~~For pipe sizes 16 inches and less, use mechanical joint complying with AWWA C111.~~

2) (REPLACE) For all pipe sizes, use restrained mechanical joint system. Provide follower gland using breakaway torque bolts to engage thrust restraint.

3. Pipe Coupling.

d. Bolts and nuts. (REPLACE) High Strength, low alloy corrosion resistant steel or stainless steel.

D. Concrete Thrust Blocks.

3. (REPLACE) The use of concrete thrust blocks is not required for water main being constructed with restrained joints. Thrust blocks are required at hydrants as shown in Figure 5020.201.

E. Pipeline Accessories.

2. Tracer System. Comply with Figures 5010.102 to 5010.105 in contract documents

d. Splice Kit: (REPLACE) See “Tracer Wire Connector” under the Accepted Products for Water Distribution Materials. This document is included as an attachment to this Special Provision.

G. Water Service Pipe and Appurtenances

1. Controlling Standards.

(REPLACE) Jurisdictional policies and procedures, plumbing and fire codes.

4150.03 VALVES.

C. Butterfly Valves.

1. Standards: (REPLACE) Comply with AWWA C504 class 150B (gray iron or ductile iron) or class 250B and NSF 61.

D. Tapping Valve Assemblies.

1. Tapping Valve.
(REPLACE) Gate valve complying with AWWA C509.

4. Gasket.
c. (DELETE) ~~Use nitrile rubber.~~

4150.04 FIRE HYDRANT ASSEMBLY.

C. Features.

4. Hose Nozzles: (REPLACE) Two, each 2 1/2 inches in diameter, caps attached to hydrant with chains.

5. Direction of Opening: (REPLACE) Clockwise, unless otherwise specified.

6. Items to be Specified: (REPLACE)
a. Operating nut: 1 1/2 inches, standard pentagon
b. Pumper nozzle: One 4 1/2 inch integral Storz connection with 1 1/2 inch pentagon nut and latch(es) effective for all new hydrants installed within the limits of Iowa City Water Distribution System after January 1, 2020.
c. Nozzle threads: National standard hose threads
d. Main valve nominal opening size: 4 1/2 inches on mains smaller than 12 inches in diameter, 5 1/4 inches on main 12 inches and larger in diameter.

7. (ADD) **Barrel Extensions:** Solid barrel without threading; only one (single) extension installed per hydrant.

D. Painting.

2. (REPLACE) Above grade exterior coating type will be Safety Red unless otherwise specified by the Engineer.

4150.05 APPURTENANCES.

B. Valve Box.

3. Type.
a. (REPLACE) Slip (slide) type.
b. (DELETE) ~~In all other areas, use a screw extension type.~~

11. (ADD) Valve boxes shall be centered over the operating nut.

C. Valve Stem Extension.
(REPLACE) Provide as necessary to raise 2 inch operating nut to within 5 or 6 feet of the finish grade. Stem diameter shall be according to valve manufacturer's recommendations, but not less than 1 inch. It shall also be stainless steel.

D. (ADD) Stainless Steel Repair Clamps.

1. All stainless steel, single section, double section, or triple section, depending upon size of main.

2. Shall have stainless steel bolts and nuts.

2554.01 DESCRIPTION.

C. (REPLACE) Test and disinfect water mains, valves, fire hydrants, appurtenances and private water services greater than 2 inches in diameter.

2554.03 CONSTRUCTION.

A. Pipe and Fittings.

1. Pipe Installation.

a. General.

8) (REPLACE) Install concrete thrust blocks on all fittings 12 inches in diameter or larger. For all fittings, install restrained joints within length(s) designed by an engineer. When specified in the contract documents, install concrete thrust blocks and restrained joints as designed.

6. Tracer System Installation.

e. (REPLACE) Install ground rods adjacent to connections to existing pipe in native, undisturbed soil and at locations specified in the contract documents or as directed by the Engineer.

f. (REPLACE) Bring two wires to the surface at each fire hydrant location and terminate with a tracer wire station.

h. (ADD) A minimum of 18 inches of wire slack at every tracer wire terminal box lid shall be installed.

i. (ADD) Every splice along the tracer wire shall have a minimum of 18 inches of wire slack added to the line.

j. (ADD) No uninsulated wire shall be installed along any length of run or at splice points. All exposed wire shall be mended as directed by the Engineer, and all splices shall include dielectric grease.

k. Ground rods should be placed 6 to 10 inches from the pipe and not make contact with any part of the water system or any other utility.

7. Conflicts.

d. Surface Water Crossings.

(REPLACE) Comply with the Recommended Standards for Water Works 2012 Edition.

10. Water Service Stub.

b. (DELETE) ~~Install 1 inch and small corporation valves tapped at 45 degrees above the horizontal at a minimum distance of 18 inches from pipe bell or other corporation. Install 1 1/2 inch and 2-inch corporation valves tapped horizontal a minimum distance of 24 inches from pipe bell or other corporation.~~

c. (DELETE) ~~Construct trench and place backfill material according to Section 2552.~~

B. Valves, Fire Hydrants, and Appurtenances.

4. Adjustment of Existing Valve Box or Fire Hydrant.

a. Minor Valve Box Adjustment.

(REPLACE) For existing adjustable boxes that have sufficient adjustment range to bring to finish grade, raise or lower valve box to finish grade. Valve boxes should be centered over valve operating nut and run straight (not angled).

5. (ADD) Tapped Connections Under Pressure.

a. Follow manufacturer's installation instructions.

b. Tapping mains for new connections 1 inch to 12 inch in diameter shall be done by the Contracting Authority. This includes connections made on public or private mains.

c. A new and site specific Jurisdiction tapping application must be prepared for each tap regardless of size, and submitted to the Engineer for approval.

6. (ADD) Water Main Operations.

a. All work which involves operating the active public water distribution system will require the notice, consent, approval and assistance of the Engineer.

b. An accurate and legible copy of the "as-built" drawings must be on file with the Contracting Authority prior to using the water supply.

c. If requested by the Engineer, the contractor will submit for approval a plan for initial operations and a plan for final operations. The plan(s) shall include a drawing and typed list of actions which show all significant steps necessary to connect to the existing water distribution system or conduct the filling, flushing and testing operations. The purpose of the plan(s) is to minimize the impact of service interruptions, and pressure and flow variations in the water distribution system.

C. Testing and Disinfection.

1. Sequence of Testing and Disinfection.

(REPLACE) Perform operations according to AWWA C651 in the sequence below. Successfully complete each operation before continuing to the next operation. The Contracting Authority will provide reasonable quantities of water for flushing and testing. All main shall pass bacteriological sampling before pressuring testing. Testing segments shall be no longer than 1200 feet. All legs or laterals shall be tested as separate segments. Water main must pass all testing before any main or service taps are made.

a. Continuous-Feed or Slug Method (After Water Main Installation):

4) (REPLACE) Perform bacteriological sampling.

5) (ADD) Perform pressure and leak testing.

b. Tablet Method (Concurrent with Water Main Installation):

3) (REPLACE) Perform bacteriological sampling.

4) (ADD) Perform pressure and leak testing.

3. Disinfection.

b. Procedure.

5) (ADD) After 24 hours, a detectable free chlorine residual of A) greater than or equal to 0.2 mg/L for the tablet method or B) greater than or equal to 10 mg/L for the continuous feed method shall be found at each sample point.

5. Pressure and Leak Testing

a. (REMOVE) ~~Remove debris from within the pipe. Clean and swab out pipe if required.~~

g. (REPLACE) The addition of makeup water is not allowed.

h. (REMOVE) ~~Accurately measure the amount of water required to repressurize the system to the test pressure.~~

i. (REMOVE) ~~Maximum allowable leakage rate according to AWWA C600:~~

~~L = (S)(D)(P)'"0.5 148,000~~

~~Where:~~
~~L = allowable leakage, in gallons per hour S = length of pipe tested, in feet~~
~~D = nominal pipe diameter, in inches~~
~~P = average test pressure, in pounds per square inch~~

~~Table 2554.03-3 assumes an average test pressure (P) of 150 psi and 1,000 feet of test section.~~

~~Table 2554.03-3: Maximum Allowable Leakage Rate~~

~~Pipe Diameter (inches)~~	~~Allowable Leakage Rate (gallons/hour/1,000 feet of pipe)~~
~~4~~	~~0.33~~
~~6~~	~~0.50~~
~~8~~	~~0.66~~
~~10~~	~~0.83~~
~~12~~	~~0.99~~
~~14~~	~~1.16~~
~~16~~	~~1.32~~
~~18~~	~~1.49~~
~~20~~	~~1.66~~
~~24~~	~~1.99~~
~~30~~	~~2.48~~
~~36~~	~~2.98~~

j. (REMOVE) ~~If the average measured leakage per hour exceeds the maximum allowable leakage rate, repair and retest the water main.~~

6. Bacteria Sampling.
(REPLACE) Test water mains according to AWWA C651. Repeated failures to produce satisfactory bacteriological results, or if other water quality is affected, will require corrective action up to and including repeating the disinfection procedure or physically cleaning the main as approved by the Engineer.

8. (ADD) System Trace.
All tracer wire terminal boxes shall be to grade, located appropriate distance from hydrant or valve, and with tracer wire correctly attached. The Contracting Authority shall complete a trace to the new pipe(s), including connections to the existing main. Any tracing deficiencies noted shall be corrected and retraced until the entire system traces correctly.

9. (ADD) System Check.

a. Valve Operations: All valves shall be located and tested to verify operation. Remove the valve box lid, insert the valve key and open and close each valve.

b. Hydrant Operations: All valves shall be located and tested to verify operation. Remove the valve box lid, insert the valve key and open and close each valve.

1) After the hydrant has been installed and the main and hydrant have been pressure tested, each hydrant shall be flushed and checked for proper operation.

2) After hydrant has been flushed, close it and check for drainage. This is done by placing a hand over the nozzle opening and checking for a vacuum. Then check the hose thread for proper fit.

3) Replace nozzle cap, then open hydrant again and inspect all joints for leaks.

City of Iowa City Water Division

Accepted Products for Water Distribution Materials

(Revised May 2020)

WATER PIPE: (Ductile) ANSI/AWWA – A21.51/C151
American, McWane, U.S. Pipe

WATER PIPE: (PVC) AWWA - C900 Pressure Class 150, DR 18
CertainTeed Certa-Lok C900/RJ or C900/RJIB for directionally bored or restrained joint piping

RESTRAINED JOINT PIPE GASKET: ANSI/AWWA C111/A21.11
American Fast-Grip, Amarillo Fast-Grip; McWane Sure Stop 350; SRP Barracuda; U.S. Pipe Field Lok 350

MECHANICAL JOINT RESTRAINT DEVICE: With NSS Cor-Blue Nuts & Bolts
EBAA 1100 and 2000 PV; Tyler Union TUFGrip 1000, 1000S, 1500, 2000, and 2000S

FITTING: ANSI/AWWA A21.10/C110 or C153, 350 psi
Romac Alpha (XL) End Cap, Sigma, Tyler Union, U.S. Pipe

TAPPING SLEEVE: (Full Body Ductile Iron) Stainless Steel and/or NSS Cor-Blue Nuts & Bolts
American Flow Control-Series 2800, Kennedy, Mueller-H615, Tyler Union

TAPPING SLEEVE: (Stainless Steel with 304* Stainless Steel Flange)
Ford FAST, JCM-432, Mueller H304, Romac SST, Smith-Blair 665, TPS Triple Tap Series TS

VALVE: (Resilient Seated Gate Valves) ANSI/AWWA C509, Open Counterclockwise
AVK Series 45, Clow 2640 F-6100, Kennedy 8571 SS, Mueller A-2362-20

VALVE: (Butterfly) ANSI/AWWA C504, Class 150B or Class 250B, Open Counterclockwise
Clow, DeZurik, GAV 800 Series, Kennedy, M & H, Mueller, Pratt Groundhog, Val-Matic

VALVE: (Tapping) ANSI/AWWA C509, Open Counterclockwise
Clow 2640 F-6114, Kennedy 8950 SS, Mueller T-2362-16

VALVE BOX: Slip Type, Heavy Duty
Sigma VB467-35 Top Section with Top Flange, Star Pipe VB-0007; Tyler Union Series 7126, Range 39”-60”

VALVE BOX CENTERING RING:
Adaptor, Inc Valve Box Adaptor II

FIRE HYDRANT: AWWA C502, Open Clockwise, 4 ½” (Main Smaller than 12”) or 5 ¼” (Main 12” and Larger), with Pumper Nozzle Storz Fitting (integral with 1 ½” pentagon nut and latched)
American Darling Mark 73-5, American Darling B-84-B-5, Clow F-2545 Medallion with all stainless-steel shaft, Mueller Super Centurion 250

STAINLESS STEEL REPAIR CLAMP: AWWA C230, With Stainless Steel Nuts & Bolts
AY McDonald 425/435 Series Teck, Romac SS1, Smith-Blair 261

SLEEVE TYPE COUPLING: AWWA C219, With Stainless Steel Nuts & Bolts
Hymax Coupling, Romac Style 501, Romac Alpha (XL) Wide Range Restraint Coupling, Romac Macro HP Two-Bolt Coupling, Smith-Blair Top Bolt 421, Smith-Blair 441

TRACER WIRE TERMINAL BOX:
Copperhead SnakePit LD14BTP, CD14BTP, RB14BTP

TRACER WIRE CONNECTOR: Blue in Color
Copperhead Industries Snake Bite Locking Connector LSC1230B, Copperhead Industries Direct Bury Single Connector, Twister DB Plus Wire Connector Model 60

TRACER WIRE: #12 AWG, Blue in Color
Copperhead, Kris Tech

FREEZELESS YARD HYDRANT:
Woodford Mfg Iowa Model Y34 and YI

SERVICE SADDLE: ANSI/AWWA C800
AY McDonald 3845, Ford 202BS, Smith-Blair 325

CORPORATION VALVE: ANSI/AWWA C800, Compression Ball Type
AY McDonald 74701BQ, Mueller B-25008N

BALL CURB VALVE: ANSI/AWWA C800, Compression Connection for CTS OD Tubing
AY McDonald 66100Q, Mueller B25209N

CURB BOX: ANSI/AWWA C800, Arch Pattern, 5-foot Length (Telescope 1-foot), Slide Style with 42" Stainless Steel Rod & Cotter Pin
AY McDonald 5601 and 5603 with 5660SS

CURB BOX LID: "W" OR "Water" Label on Lid
Cement Applications: AY McDonald 5607L
All Other Applications: AY McDonald 5601L

STRAIGHT 3-PART UNION: ANSI/AWWA C800
AY McDonald 74758Q, Mueller H-15403N, Cambridge Coupling

POLYETHYLENE WRAP: AWWA C105, 8 mil
V-Bio Enhanced, approved equivalent