



**SPECIAL PROVISIONS
FOR
VALVES, FIRE HYDRANTS, AND APPURTENANCES**

**Linn County
IM-380-6(487)14--13-57**

**Effective Date
July 30, 2024**

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

230190.01 GENERAL.

A. Section Includes.

- Butterfly Valves
- Gate Valves
- Tapping Valve Assemblies
- Fire Hydrant Assemblies
- Flushing Devices (Air Releases, Blow-offs, Flushing Stations, and Post Hydrants)
- Valve Boxes (Water Mains or Water Services)

B. Description of Work.

Install valves, fire hydrants, and appurtenances for water mains and water services.

C. Delivery, Storage, and Handling.

1. Remove valves, fire hydrants, and appurtenances contaminated with mud and surface water from the site. Do not use in construction unless thoroughly cleaned, inspected, and approved by the Engineer.
2. Store material in accordance with the manufacturers' recommendations and in locations that will minimize the interference with operations, minimize environmental damage and protect adjacent areas from flooding, runoff and sediment deposition.

D. Special Requirements.

The Water Division will furnish all labor and equipment to operate public water system valves and fire hydrants in conjunction with the work. The Water Division does not guarantee that a water shut-down will be water-tight without leak-through or occur within a specified time frame. No monetary or time compensation will be made if a water shut-down does not go as planned or

occurs after-hours.

230190.02 MATERIALS.

A. Valves.

1. General.

- a. Valve must be same size as pipeline on which it is installed, unless otherwise noted on drawings.
- b. Must be approved for buried service.
- c. All valves must be factory tested to twice the rated working pressure.
- d. **Gaskets:** Unless otherwise specified match water main gasket material.
- e. **Valve Body:** Manufacturer's name and pressure rating cast on valve body.
- f. **Direction of Opening.**
 - 1) Open when turned clockwise as viewed from the top. Opening direction arrow shall be cast on the operating nut.
 - 2) All valve operators to be supplied by valve supplier.
- g. **Joints.**
 - 1) For buried service: mechanical joints per AWWA C111. Comply with Special Provisions for Water Main Pipe and Fittings.
 - 2) For service within structures: flanged joints with dimensions and drillings according to AWWA C110 or ANSI B16.1 Class 125, unless noted otherwise. All valve operators to be supplied by valve supplier.

2. Gate Valves.

Gate valves are to be used on water main 12 inches in diameter and less, unless otherwise approved by the Engineer.

a. Standards.

- 1) Comply with AWWA C509 (gray or ductile iron) or AWWA C515 (ductile iron) and NSF 61.
- 2) Pressure rating of 200 psi working pressure up to and including 12 inch and 150 psi over 12 inch.
- 3) Body, Bonnet and Gate: Cast iron per ASTM A126 Class B or ductile iron per ASTM A536.
- 4) Exterior Finish: Fusion bonded epoxy per AWWA C550.
- 5) Interior Finish: In accordance with AWWA C550.
- 6) Type: Resilient seat.

b. Stem.

- 1) Comply with ANSI/AWWA C509.
- 2) 2 inch square operating nut.
- 3) Non-rising stem.
- 4) Stem and spindle: solid bronze bearing against bronze surface. Lead content must comply with current regulations and standards.

c. Stem Seals: Double O-ring seal permanently lubricated between seals. Lubricant certified for use in potable water.

d. Approved Manufacturers.

- 1) Mueller.
- 2) Clow.
- 3) Kennedy.
- 4) M&H.
- 5) American Flow Control.

e. External Bolts and Hex Nuts: Stainless steel according to ASTM A240, Type 304.

3. Butterfly Valves.

Butterfly valves are to be used on 16 inch and greater diameter water main, unless otherwise approved by the Engineer.

- a. **Standards.**
 - 1) Comply with: ANSI/AWWA C504 Class 150B
 - 2) Pressure rating: 150 psi working pressure.
 - 3) Body: Cast iron per ASTM A126 Class B or ductile iron per ASTM A536.
 - 4) Exterior finish: Fusion bonded epoxy per AWWA C550.
 - 5) Interior finish: In accordance with AWWA C550.
 - 6) Type: Rubber seat.
 - b. **Ends.** Mechanical joint, except as otherwise shown in the plans.
 - c. **Bearings.** Corrosion resistant and self-lubricating, sleeve type. Bearing load not greater than 1/5 the compressive strength of the bearing or shaft material.
 - d. **Stem:** Stainless steel, Type 304, turned, ground, and polished.
 - e. **Disc:** Cast iron ASTM A126 Class B, with plasma-applied nickel-chromium edge; connected to shaft by mechanically fixed stainless steel pins.
 - f. **Seat.**
 - 1) Type: Rubber; Synthetic rubber compound; simultaneously molded in, vulcanized and bonded to body.
 - 2) Bubble-tight at rated pressures with flow in either direction.
 - g. **Stem Seal.**
 - 1) Shall be of O-ring type and replaceable.
 - 2) Seal lubricant.
 - h. **Actuator.**
 - 1) Type: Designated for buried service.
 - 2) 2 inch square operating nut.
 - 3) Three bolt minimum mounting to valve.
 - 4) Hold valve in any intermediate position between fully open and fully closed without any movement or fluttering.
 - 5) Mechanical stop-limiting device preventing over-travel of the disc in the open and closed positions.
 - 6) Designed to operate the valve under full rated pressure with a maximum of 80 foot-pounds of torque at extreme operator position without damage to valve.
 - 7) Fully enclosed, gasketed, and grease packed.
 - i. **External Bolts and Hex Nuts:** Stainless steel according to ASTM A240, Type 304.
 - j. **Approved Manufacturers.**
 - 1) DeZurik.
 - 2) Mueller.
 - 3) M & H.
 - 4) Clow.
 - 5) Kennedy.
 - 6) Henry Pratt.
 - 7) VAG/GA Industries.
- 4. Tapping Valve Assemblies.**
- a. Tapping valve AWWA C509 or AWWA C515.
 - b. **Tapping sleeves for all water main diameters and tap sizes.**
 - 1) Stainless steel according to ASTM A240, Type 304.
 - 2) Minimum 14 gauge.
 - 3) Gasket shall be NSF 61 certified NBR nitrile rubber.
 - 4) Tapping sleeve and gasket must fully surround pipe.
 - 5) Working pressure 150 psi.
 - 6) Equipped with 3/4 inch test port with stainless steel plug installed.
 - 7) Flanged to accept tapping valve with dimensions and drillings according to AWWA C110, ANSI B16.1 class 125, or ANSI B16.5 class 150.
 - 8) Approved Manufacturers:
 - Romac SST III.
 - Total Piping Solutions Triple Tap.
 - Approved equal.

- c. **Tapping sleeves for water main greater than 12 inches in diameter and with a tap size less than half the nominal pipe size.**
 - 1) Carbon steel according to ASTM A283, Grade C with fusion bonded epoxy coating per AWWA C213, interior and exterior.
 - 2) Gasket shall be NSF 61 certified NBR nitrile rubber.
 - 3) Tapping sleeve must fully surround pipe.
 - 4) Working pressure 150 psi.
 - 5) Equipped with 3/4 inch test port with stainless steel plug installed.
 - 6) Flanged to accept tapping valve with dimensions and drillings according to AWWA C110, ANSI B16.1 class 125, or ANSI B16.5 class 150.
 - 7) Approved Manufacturers:
 - Romac FTS420.
 - Smith Blair 622.
 - Approved equal.
- d. Tapping sleeves fabricated from cast or ductile iron according to ASTM A536 will be allowed only with approval of the Engineer.
- e. **Hex Nuts and Bolts:** Stainless steel according to ASTM A240, Type 304.

B. Fire Hydrant Assembly.

- 1. **Material:** Comply with ANSI/AWWA C502 as modified.
- 2. **Manufacturers.**
 - a. Public Improvements: Clow Medallion.
 - b. Private Improvements: Clow Medallion, Kennedy Guardian K81-D, Mueller Super Centurion 250, or Approved Equal.
- 3. **Features.**
 - a. Main Valve Size: 5 1/4 inch.
 - b. Inlet Connection Type 6 inch MJ.
 - c. Direction of Opening: Right (clockwise).
 - d. Pumper Nozzle Size: 5 inch Storz Connection.
 - 1) Storz connection shall have brass metal face and hard anodized aluminum Storz ramps and lugs.
 - 2) Cap shall have hard anodized aluminum Storz ramps and lugs and be connected to the fire hydrant with 0.125 inch vinyl coated aircraft cable.
 - 3) Text "OPEN" and arrow cast on top.
 - 4) Bronze drain ring, valve seat ring, and upper and lower valve plates.
 - e. Pumper Nozzle Thread 5.562 inch OD with 6 turns per inch.
 - f. Hose Nozzle Number/Size: Two, each 2 1/2 inches in diameter.
 - g. Hose Nozzle Thread: 3.065 inch OD with 6 turns per inch.
 - h. Operating Nut: 1 inch square.
 - i. Nominal Depth of Bury: 6 feet.
 - j. Breakaway Items: Stem coupling and flange.
 - k. Stem: Upper stem, safety coupling, and lower stem to be stainless steel, Type 304, turned, ground, and polished.
- 4. **Painting.**
 - a. Shop coating according to ANSI/AWWA C502.
 - b. Exterior below grade: Asphaltic coating.
 - c. Exterior above grade: 9 mil epoxy plus two coats enamel. Color: RAL 6005.
- 5. **External Bolts and Hex Nuts:** Stainless steel according to ASTM A193, Grade B8.
- 6. **Auxiliary Gate Valve:** Comply with this special provision.

7. **Pipe and Fittings:** Comply with Special Provisions for Water Main Pipe and Fittings.

C. Appurtenances.

1. **Flushing Device:** As specified in the contract documents. All pipe fittings shall have National Pipe Thread pattern.
 - a. **Air Release Assemblies:** Nominal size: 1 inch minimum.
 - b. **Blow-off Assemblies:** Nominal size: 2 inch minimum.
 - c. **Flushing Stations:**
 - 1) Nominal size: 2 inch minimum.
 - 2) Manufacturer: Kupferle Foundry, Eclipse #9800
 - d. **Post Hydrants:**
 - 1) Nominal size: 2 inch minimum.
 - 2) Manufacturer: Kupferle Foundry, MainGuard #77

2. **Valve Box.**
 - a. **Applicability:** For all buried gate, butterfly, or tapping valves. For curb stop valve boxes, refer to the Comply with Special Provisions for Water Main Pipe and Fittings.
 - b. **Manufacturer.**
 - 1) East Jordan Iron Works 8560.
 - 2) Tyler Model 6860D HD, Domestic Heavy Duty.
 - 3) Bingham Taylor.
 - 4) Approved equal.
 - c. **Type.**
 - 1) In paved areas, use a slide extension type.
 - 2) In all other areas, use a screw extension type.
 - d. **Material:** Gray iron.
 - e. **Cover:** Gray iron, labeled "WATER".
 - f. **Wall Thickness:** 1/4 inch, minimum.
 - g. **Inside Diameter:** 5 1/4 inches, minimum.
 - h. **Length:** Adequate to bring top to finished grade, including valve box extensions, if necessary.
 - i. **Factory Finish:** Asphalt coating.
 - j. **Valve Box Centering Ring:** Include in installation.

3. **Valve Stem Extension:** For buried valves over 7 feet deep, provide extension as necessary to raise 2 inch operating nut to within 4 to 6 feet of the finished grade.

230190.03 CONSTRUCTION.

A. General.

1. Install according to the contract documents.
2. Apply polyethylene wrap to all iron pipe, valves, fire hydrants, and fittings.
3. Set tops of valve boxes to finished grade in paved areas and 2 inches below finished grade in non-paved areas unless otherwise directed by the Engineer. Valve boxes shall be plumb and free from debris.
4. Check the working order of all valves by opening and closing through entire range. Operate valves only under direction of Water Division personnel.
5. Test and disinfect all valves, fire hydrants, and appurtenances as components of the completed water main according to Special Provisions for Water Main Testing and Disinfection.

6. Measure the outside diameter of the existing pipe at the location being connected to or tapped prior to receiving Water Division furnished materials as specified.

B. Flushing Devices (Air Releases, Blow-offs, Flushing Stations, and Post Hydrants).

1. Install and construct as specified in the contract documents. If not specified, install flushing devices as directed by the Engineer.
2. Install gravel backfill.
3. Install thrust block, bearing on perpendicular excavation face of undisturbed earth.
4. Drain-back holes are not allowed.

C. Fire Hydrant.

1. Install according to contract documents. Ensure a 3 foot clear space around the circumference of the fire hydrant.
2. If the fire hydrant valve is positioned adjacent to the water main, attach it to an anchor tee.
3. If the fire hydrant valve is positioned away from the water main, restrain all joints between the valve and water main.
4. Fire Hydrant Depth Setting.
 - a. Use adjacent finished grade to determine setting depth.
 - b. Set bottom of breakaway flange between 2 and 5 inches above finished grade.
 - c. If finished grade is not to be completed during the current project, consult with the Engineer for proper setting depth.
5. Coordinate installation with tracer wire installation.
6. Orient fire hydrant with pumper nozzle facing roadway, or as directed by the Engineer.
7. Tee, auxiliary valve, and associated piping (but not barrel) shall be wrapped with polyethylene wrap.
8. When determined by the Engineer, scratches, chips, cracks, pits or mars to the finish will require the entire exposed portion of the fire hydrant to be re-painted as follows:
 - a. Prepare surface per paint manufacturer's directions for surface preparation, primer, temperature and humidity and application.
 - b. Remove all debris on hydrant, including but not limited to, hydroseed, spray mulch, mud and dirt with sandpaper, an abrasive pad, or wire brush.
 - c. Surface shall be clean, dry, and free from oil, grease, or other contaminants.
 - d. Paint all base metal with one coat of recommended primer.
 - e. Paint: A mineral spirits based 200 Series Silicone Alkyd Enamel containing no lead or chromium compounds and having superior UV resistance for brush, roller or spray application. Color to match RAL 6005.

D. Adjustment of Existing Valve Box or Fire Hydrant.

1. **Valve Box Adjustment:** For existing adjustable boxes that have sufficient adjustment range to bring to finished grade, raise or lower valve box to finished grade.
2. **Valve Box and Stem Extension:** For existing valve boxes that cannot be adjusted to finished grade, install valve box and stem extensions as required.

3. Fire Hydrant Adjustment.

- a. Fire hydrant extensions will be allowed only with approval of the Engineer. If possible, adjust height by deflection of joints. If necessary, adjust height by use of fittings.
- b. Paint exterior of new barrel section to match existing fire hydrant unless otherwise specified.

E. Abandonment of Existing Valves.

- 1. Removal of valve box includes removal of the top 2 sections of a three-piece valve box or removal to a minimum of 5 foot below top of grade.
- 2. Fill void after removal with sand, crushed stone, or flowable mortar.

250190.04 METHOD OF MEASUREMENT.

A. Valve (Butterfly or Gate).

Each type and size of valve will be counted.

B. Installation of Valve (Butterfly or Gate).

Each type and size of valve and box supplied will be counted.

C. Tapping Valve Assembly.

Each size of tapping valve assembly will be counted.

D. Installation of Tapping Valve Assembly.

Each size of tapping valve assembly supplied will be counted.

E. Fire Hydrant Assembly.

Each fire hydrant assembly will be counted.

F. Installation of Fire Hydrant Assembly.

Each fire hydrant assembly supplied will be counted.

G. Flushing Devices (Air Releases, Blow-offs, Flushing Stations, and Post Hydrants).

Each type and size of flushing device will be counted.

H. Valve Box Adjustment (Water Mains or Water Services).

Each existing adjustable valve box raised or lowered to finished grade will be counted.

I. Valve Box and Stem Extension.

Each existing valve box adjusted to finished grade by adding a valve box and stem extension will be counted.

J. Valve Box Replacement (Water Mains or Water Services).

Each existing valve box replaced with a new valve box will be counted.

K. Valve Box Removal.

Each valve box removed will be counted.

L. Relocation of Existing Fire Hydrant.

Each fire hydrant to be relocated will be counted.

M. Removal of Flushing Device (Air Releases, Blow-offs, Flushing Stations, and Post Hydrants).

Each flushing device removed will be counted.

N. Fire Hydrant Adjustment.

Each existing fire hydrant adjusted to finished grade by removal and reinstallation or the addition of an extension barrel section and stem will be counted.

O. Removal of Fire Hydrant Assembly.

Each fire hydrant assembly removed will be counted.

P. Removal of Valve.

Each size of valve removed will be counted.

250190.04 BASIS OF PAYMENT.

A. Valve (Butterfly or Gate).

Payment will be at the unit price for each type and size of valve. Unit price includes, but is not limited to, trench excavation; furnishing and installing valve and box; furnishing and installing all components attached to the valve or required for its complete installation, including underground or above ground operators, valve box and stem extensions, joint restraints, gaskets, and pipe and couplings (if necessary); furnishing, placing, and compacting bedding and backfill material; and adjustment of valve box to final grade.

B. Installation of Valve (Butterfly or Gate).

Payment will be at the unit price for each supplied valve and box installed. Unit price includes, but is not limited to, trench excavation; pick-up and delivery of owner supplied valve, valve box, gaskets, and bolt packs to the jobsite; installation of valve and box; furnishing and installing all components attached to the valve or required for its complete installation, including underground or above ground operators, valve box and stem extensions, joint restraints, gaskets, and pipe and couplings (if necessary); furnishing, placing, and compacting bedding and backfill material; and adjustment of valve box to final grade.

C. Tapping Valve Assembly.

Payment will be at the unit price for each tapping assembly. Unit price includes, but is not limited to, trench excavation; furnishing and installing the assembly, including tapping sleeve, tapping valve, and the tap (if necessary); furnishing and installing valve box and stem extensions; and

D. Installation of Tapping Valve Assembly.

Payment will be at the unit price for each supplied tapping assembly installed. Unit price includes, but is not limited to, trench excavation; pick-up and delivery of owner supplied tapping sleeve, tapping valve, valve box, gaskets, and bolt packs to the jobsite; installation of assembly and supplied material, and the tap (if necessary); furnishing and installing valve box and stem extensions; and adjustment of valve box to final grade.

E. Fire Hydrant Assembly.

Payment will be at the unit price for each fire hydrant assembly. Unit price includes, but is not limited to, trench excavation; furnishing and installing the assembly, including the fire hydrant, barrel, components to connect the fire hydrant to the water main, anchoring pipe, anchor tee, fittings, thrust blocks, cast in-place thrust blocks, mechanical joint restraint, pea gravel or porous backfill material, auxiliary valve and appurtenances, including tapping valve assembly if used, and adjustment of assembly and valve box to final grade.

F. Installation of Fire Hydrant Assembly.

Payment will be at the unit price for each supplied fire hydrant assembly installed. Unit price includes, but is not limited to, trench excavation; pick-up and delivery of owner supplied fire hydrant, auxiliary valve, valve box, gaskets, and bolt packs to jobsite; installation of assembly and supplied materials; furnishing and installing anchoring pipe, anchor tee, fittings, thrust blocks, cast in-place thrust blocks, mechanical joint restraint, pea gravel or porous backfill material, other materials necessary for installation, and adjustment of assembly and valve box to final grade.

G. Flushing Devices (Air Releases, Blow-offs, Flushing Stations, and Post Hydrants).

Payment will be at the unit price for each flushing device. Unit price includes but is not limited to, trench excavation; furnishing and installing flushing device, including the tapping saddle, pipe, fittings, valves, curb boxes, support blocking, thrust block, and mechanical joint restraint; furnishing, placing, and compacting bedding and backfill material; and

H. Valve Box Adjustment (Water Mains or Water Services).

Payment will be at the unit price for each valve box adjustment. Unit price includes, but is not limited to, adjustment of existing valve box to final grade; furnishing and installing valve box riser (if necessary); and furnishing and installing locking lid (in sidewalk or driveway pavement only) for water services.

I. Valve Box and Stem Extension.

Payment will be at the unit price for each valve box and stem extension. Unit price includes, but is not limited to, trench excavation; valvebox replacement (if necessary); furnishing and installing valve box and stem extension, valve box adjustable riser, and PVC pipe as needed; furnishing, placing, and compacting backfill material; and adjustment of valve box to final grade.

J. Valve Box Replacement (Water Mains or Water Services).

Payment will be at the unit price for each valve box replacement. Unit price includes, but is not limited to, excavation and removal of existing valve box; furnishing and installing new valve box and all other necessary appurtenances, including locking lid (in sidewalk or driveway pavement only) for water services; furnishing, placing, and compacting backfill material; and adjustment of valve box to final grade.

K. Valve Box Removal.

Payment will be at the unit price for each valve box removed. Unit price includes, but is not limited to, excavation, removal of each valve box, backfill, compaction, and surface restoration to match the surrounding area.

L. Relocation of Existing Fire Hydrant.

Payment will be at the unit price for each fire hydrant relocated. Unit price includes, but is not limited to, removal and reinstallation of the existing fire hydrant; short term on-site storage of fire hydrant assembly; furnishing and installing all other materials necessary for reinstallation; and adjustment of fire hydrant and valve box to final grade.

M. Removal of Flushing Device (Air Releases, Blow-offs, Flushing Stations, and Post Hydrants).

Payment will be at the unit price for each permanent flushing device removed. Unit price includes, but is not limited to, removal and disposal or delivery to Water Division; disposal of miscellaneous fittings; capping or plugging the water main; repairs to the polyethylene wrap and/or tracer wire; and furnishing and compacting backfill material.

N. Fire Hydrant Adjustment.

Payment will be at the unit price for each adjustment of an existing fire hydrant. Unit price includes, but is not limited to, removal and reinstallation of the existing fire hydrant; furnishing and installing the extension barrel section and stem, and all necessary appurtenances; adjustment of fire hydrant and valve box to final grade; and disinfection.

O. Removal of Fire Hydrant Assembly.

Payment will be made at the unit price for each fire hydrant assembly removed. Unit price includes, but is not limited to, excavation and removal of couplings, auxiliary valve and box, and anchoring pipe (if necessary); replacing the removed assembly with pipe and couplings if required, or capping the former valve connection; disposal or delivery of the assembly to the Water Division (as directed by the Engineer); and backfill, compaction, and surface restoration to match the surrounding area.

P. Removal of Valve.

Payment will be made at the unit price for each valve removed. Unit price includes, but is not limited to, excavation and removal of each valve, valve box, and pipe (if necessary); replacing the removed valve with pipe and couplings if required, or capping the former valve connection; furnishing all other fittings and necessary appurtenances; disposal or delivery of the valve to the Water Division (as directed by the Engineer); and backfill, compaction, and surface restoration to match the surrounding area.