SECTION 0200 WATER SYSTEMS

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SECTION 0200 WATER SYSTEMS

0201 GENERAL REQUIREMENTS

0201.1 ODEQ Design Criteria

The minimum design criteria for all public water facilities shall be the latest edition of Title 252. Oklahoma Administrative Code, Chapter 625, Public Water Supply Construction Standards, Oklahoma Department of Environmental Quality (ODEQ).

0201.2 ODEQ Permitting

All plans pertaining to distribution and treatment of public drinking water must be approved by ODEQ. The Developer shall submit six (6) sets of plans, one (1) original of the ODEQ Engineering Report form and one (1) original of the ODEQ Permit to Construct form to the Engineer for review and approval. Upon approval, the City of Owasso shall stamp the approved submittals and return four sets of plans, the Engineering Report and the ODEQ Permit to Construct form to the Developer. The Developer (or his design engineer) is responsible for transmitting three sets of plans, the Permit to Construct form, the Engineering Report and the review fee to ODEQ.

0201.3 Maintenance Bond

The construction contractor shall post a Maintenance Bond or Irrevocable Letter of Credit in an amount equal to 100 percent of the determined amount of construction costs for a two-year period after completion and acceptance of all improvements. The bond shall be written such that the City is the grantee.

0201.4 City of Owasso Water System Master Plan

The City of Owasso has adopted a Water Master Plan. Copies are available for review by designers. Water line sizes shall conform to the Water Master Plan and the most recent updates available through the Engineer.

0201.5 City of Owasso Review

The City of Owasso may direct changes as necessary to water line alignment, grade, size, valve, and hydrant placements. Design calculations shall be presented within the engineering report for review by the Engineer.

0201.6 Alignment Surveys

Alignment surveys for water line projects shall be performed as specified in Section 0110, General; Paragraph 0116.3, Alignment Surveys.

0201.7 Plan Requirements

All construction plans shall comply with Subsection 0117, Drafting, in the Engineering Design Criteria.

0202 WATER SYSTEM DESIGN

0202.1 Water Lines

A. Working Pressures:

1. The Owasso Public Works Department will furnish to the design engineer normal working pressures in the area of the proposed development (if available).

2. The system shall be designed to maintain a minimum pressure of 25 psi at ground level at all points in the distribution system under all conditions of flow.

3. The maximum pressure in the system shall be 100 psi.

B. Water main and sanitary sewer main separation: In no case shall a water main be designed closer than 2 feet vertically or 10 feet horizontally to a sanitary sewer, unless the sewer line is replaced with pressure pipe. Water mains unable to cross over sewer mains with the 2-foot minimum separation and the 3-foot burial depth shall cross the sewer at a minimum distance of 2 feet under the sewer and be encased in concrete.

C. Water main and underground storage tank separation: Polyvinyl chloride (PVC) water lines shall be located at least 50 feet from any gasoline storage tank, as measured from the edge of the pipe to the edge of the closest edge of the storage tank. Wherever the 50-foot separation cannot be met, ductile iron pipe shall be used.

D. Water main and septic tank separation: Water lines shall be located at least 15 feet from any septic tank, as measured from the edge of the pipe to the edge of the tank.

E. Water main and other utility separation: Water lines shall be located 10 feet horizontally from underground electric, oil lines, gas lines, storm sewer, underground cable and telephone lines. Deviation from these separation requirements will be reviewed on a case-by-case basis.

F. Alignment: Water mains along all streets shall be on the south or east side of the right-of-way. Water mains in collector and residential streets shall be located in conformance with the Standard Details. Generally, water mains not in street right-of-way shall be centered in a minimum 15-foot-wide utility easement.

G. Pipe sizes: Sizes shall be dictated by the Water Master Plan, in general. Where not specified by the Water Master Plan, the minimum size of water mains shall be:

1. Twelve inches in diameter on all arterial streets,

2. Eight inches in diameter on all collector streets,

3. Six inches in diameter on all other water mains that are designed to produce fire flows appropriate for the property they serve.

H. Pipe joints: All pipe joints shall be mechanically restrained (Mega-Lug) in accordance with the manufacturers recommendations and shown on the plan and

profile sheets. Computer software is available to determine the extent (limits) of required mechanical joints. Concrete thrust blocking will be allowed only under special circumstances as approved by the Engineer.

I. Depths:

1. Maximum permissible depth of cover is 8.0 feet,

2. Minimum allowable cover is 3.0 feet.

J. Pipe Materials: The City of Owasso requires the following water pipe:

1. Polyvinyl chloride (PVC): AWWA C-900, DR 18, Class 150. For pipe greater than 12 inches in diameter, AWWA C905, Class 200, DR 21 is required.

2. Ductile iron pipe (DIP): AWWA C-151. For pipe 4 inches to 12 inches in diameter, use Pressure Class (PC) 350. For 14-inch to 20-inch, use PC250. For 24-inch, use PC200. For pipe larger than 30 inches, use PC150.

3. Copper water service lines: Pipe shall be SDR-9 copper tubing (Type K,L or M) conforming to ASTM B-88 and ANSI/NSF Standard 61.

K. Looping systems: Dead end mains shall be minimized by looping. Length of dead-end mains shall not exceed 300 feet for main sizes 8 inches and smaller. All cul-de-sacs shall be looped.

L. Underground creek crossings:

1. Minimum burial depth for water lines at creek crossings shall be 4 feet.

2. Water line crossings using ductile iron pipe shall be restrained-joint construction. The trench shall be backfilled with concrete to an elevation 2 feet above top of pipe through the creek area and extending at least 5 feet into the bank. As an alternate, the line may be constructed with sleeved PVC pipe with a steel casing pipe extending 5 feet into the stream bank. The casing pipe shall be anchored with concrete at each bank.

3. Crossings over 15 feet wide will require valves on each side of the crossing and a valve manhole on the upstream end with sampling taps on each side of the valve for leak detection.

4. Stream banks shall be returned to the original slope and protected from erosion.

M. Aerial water crossings:

1. Aerial water crossings shall only be allowed under special circumstances and shall be reviewed by the Engineer prior to design. The bottom of the pipe shall be above the 50-year flood elevation. Any deviation from this requirement must be approved by the ODEQ.

2. Aerial water crossings shall be insulated from freezing, anchored, and accessible for repairs. Expansion joints shall be installed at all connections between below-ground and above-ground pipe.

3. Crossings may be constructed with either restrained-joint ductile iron pipe or sleeved PVC pipe. In each case, the pipe or steel casing pipe shall be adequately supported with concrete piers within two feet of joints and anchored at each stream bank. The ductile iron pipe or casing must extend 5 feet into the banks.

4. Disturbed stream banks shall be protected with concrete slope protection or 12-inch riprap with fabric.

5. Piers shall be designed so that the top of the footings are a minimum of 2 feet below the bottom of the stream flowline to prevent frost heave, overturning and settlement.

0202.2 Fire Hydrants

A. Fire hydrants shall be AVK, American-Darling or Mueller. Hydrants shall be placed where emergency vehicles can gain access and shall be located in the street right-of-way as shown in the standard details. The finish grade elevation at each fire hydrant shall be shown.

B. Fire hydrants shall be equipped with a 4.5-inch pumper outlet (facing street) and two 2.5-inch outlets and shall be oil-filled.

C. Hydrant locations and spacing shall be approved by the Fire Marshal.

D. Fire hydrants shall be designed so that the center of the lowest outlet is 18 inches above the surrounding finished grade.

E. Fire hydrants shall be equipped with individual gate valves and boxes.

F. Fire hydrant barrel drains shall not be connected to the storm drainage or the sanitary sewer.

G. Fire hydrants shall not be installed on mains less than 6 inches in diameter.

H. Fire hydrant connection to the water main shall be in accordance with the Standard Details.

I. Working pressures at hydrants shall be obtained from the Fire Department. Operating pressures under all flow conditions shall be in accordance with the International Fire Code.

J. Fire hydrants located on the City of Owasso water system shall be factory painted (baked enamel) Federal Yellow. Fire hydrants on any other water system shall be factory-painted red.

K. The main valve shall be 5 ¼”.

0202.3 Gate Valves

A. General: Valves shall be iron body, non-rising stem resilient seat gate valves conforming to AWWA C509. Approved manufacturers are: AVK, Mueller Company, American-Darling or American Pipe Company.

B. Resilient seat gate valves shall be located no more than 500 feet apart in residential and high value districts. In rural areas valves shall be located every 1,320 feet.

C. Valves shall be located at street intersections for easy access.

D. Valves shall be installed on all four legs of a cross and all three legs of a tee or a wye.

E. Valves shall be placed at every location where a line size increases or decreases.

F. Valves shall be located on either side of a highway or major roadway crossing.

G. Valve boxes shall be equipped with reinforced concrete collars as shown in the standard details unless otherwise allowed by the Engineer.

H. Butterfly valves shall only be allowed with approval of the Engineer.

0202.4 Blow-off Assembly

A. Where dead-end mains have been approved by the Engineer, blow-off assemblies shall be installed.

B. Blow-offs assemblies shall be located near creeks and low areas so the water line can be drained without the use of mechanical equipment.

C. Blow-off assemblies shall not be connected to storm or sanitary sewer.

0202.5 Air Relief Valves

A. Air relief valves shall be installed at high points where air can accumulate (i.e., where high point of pipeline is more than 2 feet above the nearest low point).

B. Air relief valves shall be located in areas that do not flood the manhole or chamber.

C. Air relief valve piping shall be installed so that the relief piping shall extend 12 inches above grade and provided with a screened, downward facing elbow. Piping shall be provided with protection from mowing machines.

D. Drains from air relief valves shall not be connected to any storm or sanitary sewer.

0202.6 Isolation Valves

A. Fire protection and irrigation systems shall be isolated from potable water systems by a backflow preventer.

0202.7 Tracer Wire

A. A #12 copper tracer wire shall be installed on all PVC water pipe in conformance with the Standard Details.

B. The tracer wire shall be connected to fire hydrant and valve flanges.

0202.8 Warning Tape

A. Blue and silver plastic tape printed with the words "Water Line" shall be placed 6 inches above pipe atop the bedding as shown in the Standard Details.

0202.9 Special Situations

A. Areas that are outside corporate limits but serviced by the City water system shall meet all the standards within this section.

B. Areas that are inside corporate limits but serviced by a rural water district system shall be designed to meet the district's criteria except that City of Owasso fire protection criteria shall be followed.

C. All water lines under paved areas shall be sleeved.

0203 APPLICABLE STANDARD DETAILS

WAT-01	Water Pipe Installation
WAT-02	Installation of 3-Way Fire Hydrant
WAT-04	Long Water Service (Single)
WAT-05	Long Water Service (Double)
WAT-06	Water Service Line Street Crossing
WAT-11	Waterline at Cul-de-Sac
WAT-12	Blowoff Hydrant
WAT-13	Air Relief Valve and Vault
WAT-14	Valve Box Detail
WAT-16	Pipe Encasement & Cradles
WAT-17	Mechanical Restraint for Joints

END OF SECTION