

**CITY OF AKRON, OHIO
DEPARTMENT OF PUBLIC SERVICE
WATER SUPPLY BUREAU**

SPECIFICATIONS FOR FIRE HYDRANTS WITH 6 INCH VALVE OPENING

TYPE

The hydrants shall be the post type with a dry barrel, compression type valve that closes with the water line pressure, and designed for a working pressure of 175 pounds per square inch in ordinary water works service. Hydrants shall have a six-inch diameter main valve opening. Wet barrel hydrants are not acceptable. The hydrant bid must have been in production for at least one year prior to the date of the bid.

Approved brands and models shall be:

AFC B-84-B with six inch valve

DRAWINGS AND SPECIFICATIONS

Bidders proposing hydrants not previously approved must submit with their bids detailed drawings, clearly legible certified flow and pressure loss charts conforming to nozzle sizes specified in the section "Testing Procedure and Results", and specifications of the hydrants which they propose to furnish. The bidder shall furnish a list of municipalities where the hydrant has been in use for at least one year. The hydrant shall conform to the requirements of the latest revision of AWWA C502, "Standard for Dry-Barrel Fire Hydrants", except as hereinafter modified, and in accordance with the detailed drawings and specifications furnished by the Bidder with their bid, or subsequently approved by the Akron Water Supply Bureau (AWSB). Bids submitted without the required information may be rejected.

BURY LENGTH

The bury length (distance from the bottom of the inlet connection to the ground line) shall be 5 feet and 6 inches (5' - 6").

TYPE OF SHUT-OFF

Hydrants shall have a compression type shut-off, closing with the line pressure, and shall be of center stem construction.

INLET CONNECTION

Inlet may be mechanical joint per ANSI A21.11 specification. Size of inlet shall be **eight (8) inches** unless otherwise specified in the bid documents or contract drawings. Bolts, nuts, rubber gaskets, and gland rings for the inlet connection are **not** required with the hydrants.

Inlet may incorporate a stab-fit design requiring the use of only one Type 304 stainless steel fastener. The joint shall be designed such that installation torque shall be 45 ft.-lbs. or less. Joint to be configured with a one-piece full circumferential end ring and ductile iron grippers for an even distribution of thrust loads. Restraint accessories shall be factory installed.

HOSE NOZZLES AND CAPS

Each hydrant shall have two (2) 2-1/2 inch and one (1) 4 inch bronze nipples threaded to conform to the Akron, Ohio, Fire Department Standard Hose Coupling as shown on the Akron Water Supply Bureau Standard Construction Drawing W-7.1 Hydrant Standard Hose Coupling.

Diameter of nozzle	4"	2-1/2"
Outside diameter of thread	4.875"	3.230"
Root diameter	4.627"	2.962"
Total threaded length	1-1/8"	15/16"
Threads per inch	6	6

The outer end of the thread shall be blank and drawn out by a "Higbee Cut" to avoid crossing and mutilating the finely drawn out thread.

Nipples shall be tamper-resistant with "O" ring seals, threaded directly into the hydrant barrel with a left-handed thread or quarter-turn type with a stainless steel retaining screw. Bushings will not be permitted.

Nozzle cap chains shall **not** be included.

DIRECTION OF OPENING

Hydrants shall open by turning to the left (counter clockwise). There shall be cast on the hydrant in characters raised 1/8 inch the type of hydrant, an arrow, and the word "OPEN" in letters in relief indicating the direction to turn to open the hydrant.

OPERATING NUT

The size and shape of the operating nut shall be a 1-1/2 inch pentagon measured from the point to the flat. The operating nut thrust collar shall bear against an antifriction washer or ball bearing while the operating nut is turned in the opening direction.

A weather shield shall cover the gap between the stem and the bonnet.

HYDRANT BARREL

Hydrant barrels shall be made in two sections. The union between the upper and lower barrels shall be made by a traffic safety device that will break cleanly upon impact. The barrels shall be strong enough to withstand normal handling such as would be encountered in loading, unloading, and installation. The design shall be such that the

upper barrel may be rotated from 1 to 360 degrees in one-degree increments without disassembly of the hydrant barrels.

Minimum inside barrel diameter shall be (7) inches.

Breaking devices relying on flanges with weakened bolts are not acceptable. Devices that are acceptable are a one or two-piece safety flange.

Bolts securing the dome to the upper barrel shall have exposed nuts to facilitate their removal without requiring a bolt extractor if frozen or galled. Dome nuts and bolts shall be stainless steel.

Bolts securing the lower barrel to the shoe shall be made of stainless steel.

The hydrant shall be constructed that if the barrel should be broken, the main valve will remain closed.

The barrel shall be designed to permit the use of one or more standard flanged extension barrels, to be available from the hydrant manufacturer in lengths from 6 to 36 inches in 6-inch increments. The breakable traffic flange shall be marked and distinguishable from the extension flange.

VALVE AND DRAIN STEM

The valve and drain shall be operated by a single stem furnished in two sections of high tensile steel. The upper section shall have a bronze sleeve where it passes through the "O" rings and shall have a bronze stop nut to limit the travel of the rod. Auxiliary stems will not be permitted. The stem shall be designed to permit the use of standard stem extensions, which are to be available from the hydrant manufacturer in lengths of six-inch increments. The hydrant stem shall be of two parts, joined by a breakable stem coupling, with stainless steel pins. The stem coupling shall be located at the same approximate elevation as the ground flange. The valve assembly shall include no less than two positive acting drain valves. If indicated on the list of items to be ordered, hydrants will be furnished with threaded drain outlets to accommodate an NPT brass plug or fitting, (provided by others).

MAIN VALVE AND SEAT RING

All hydrants shall have a main valve opening of at least six inches in diameter. The valve gasket shall be a synthetic rubber at least one inch (1") thick.

The seat ring and main valve assembly shall be removable from ground level without disturbing the barrel with a lightweight seat removal wrench. The seat ring, in conjunction with the bronze bushing, shall form an all bronze drainway. All bronze parts must contain no more than 16 percent zinc. All pressure seals used between the seat ring and bronze bushing shall be rubber "O" rings.

PACKING AND STUFFING BOX

No less than two "O" ring seals shall be used.

GASKETS

Flanged joints shall have approved composition rubber gaskets or "O" ring gaskets.

MATERIALS

All hydrants shall be fully bronze mounted. All bolts and nuts shall be electrogalvanized, cadmium or zinc plated, or stainless steel where required in the above specifications.

EPOXY COATING

The hydrant shoe and lower valve plate shall be coated with a non-toxic two part thermosetting epoxy or electrobonded powdered epoxy complying with the latest revision of AWWA Standard C550. The coating shall have a satin finish and shall have a successful record of performance in water works applications.

PAINTING

The upper barrel and dome shall be painted with a satin finish of chrome yellow (DuPont Nason 1663 safety yellow enamel, or approved equal).

FLOW AND PRESSURE LOSS TESTS

A great amount of consideration in the award of the contract will be made for hydrants that provide maximum flows at minimal pressure losses. Pressure loss through the pumper nozzle shall not exceed 2.0 pounds per square inch at 1,000 gallons per minute.

TESTING PROCEDURE AND RESULTS

All flow and pressure loss tests must be conducted and documented by a qualified reputable testing laboratory or witnessed by a knowledgeable professional engineer versed in hydraulic testing. Flow and pressure loss tests must have been completed within the last five years for an exact production line model of the hydrant to be furnished in this contract. The testing procedure shall be in accordance with the latest revision of AWWA Standard C502, Section Five. The report for the certification of the hydrant test shall include, but not be limited to the following:

1. Name model, or catalog number of the hydrant being tested.
2. Production year of the hydrant being tested.
3. Testing equipment diagram including, but not limited to, the following pertinent dimensions:
 - a. Interior diameter of the inlet piping.
 - b. Distance from the meter flange to the manometer inlet tube.
 - c. Distance from the manometer inlet tube to the hydrant inlet.
 - d. Depth of hydrant bury.
 - e. Distance from the nozzles to the manometer inlet tube.

- f. Interior diameter and length of the discharge tube.
- 4. Accuracy tests or curves of the meter used to measure discharge.
- 5. Accuracy of all other measuring devices.

TEST OBSERVATION BY THE CITY

Upon request by the City of Akron, the bidders shall agree to conduct, at their expense, the above flow and pressure loss tests, a teardown test of the production model hydrant and a traffic accident tests for observation by City of Akron designated representatives.

TESTING

All hydrants shall be tested at 300 pounds per square inch pressure before leaving the factory as specified in AWWA Standard C502.

Hydrants must be fully opened before shipping in order to test the freedom and strength of the parts. The condition of the test should be made as severe as would occur when using a hydrant wrench at least 17 inches long.

The manufacturer shall submit to the City, upon request, a sworn statement of the results of the hydrant tests.

INSTRUCTIONS TO BIDDERS

When analyzing the bids received, the City will give a great amount of consideration to bids for hydrants with maximum flows at minimal pressure losses and also will take into account the relative strength and reliability of the several types of hydrants offered, their durability, availability, ease of renewal of the working parts, and the initial cost of a start-up parts inventory.

The City of Akron has startup and replacement parts inventories for the aforementioned approved brand and model of 6-inch valve hydrants.

Bidders whose hydrants meet specifications but are not previously approved shall quote the cost of a start-up repair parts inventory, which will be acquired by the City. This additional inventory expense will be considered by the City when evaluating bids and determining whether to accept a new hydrant model. A start-up repair parts inventory will consist of the following hydrant parts and quantities:

Extension, 6 inch	12
Extension, 12 inch	12
Extension, 18 inch	3
Nozzle, 2.5 inch (incl. O-ring and set screw)	6
Nozzle, 4 inch	3
Main valve assembly, incl. O-ring	18

Safety flange repair kit	12
Operating stem	1
Operating stem O-ring	6
Operating stem nut	3
Stem couplings & pins	12
Dirt shield (if applicable)	8
Bonnet gasket	24
Standpipe gasket	12
Elbow gasket	12
Tool kit	2

Bidders proposing hydrants not previously approved shall submit with their bids detailed drawings, flow and pressure loss charts, specifications, and the standard current replacement parts price list for the hydrant they propose to furnish. Bidder shall also furnish a list of municipalities where their hydrants have been in use for at least one year.

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