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August 13, 2015

Via Hand Delivery

Jean Jewell, Secretary
Idaho Public Utilities Commission
472 W. Washington St.
Boise, Idaho 83720

Re: Case No UWI-W-15-02

Dear Ms. Jewell:

Enclosed for filing please find an original and seven (7) copies of the Reply Comments of United Water Idaho Inc.

If you have any questions, please do not hesitate to contact me.

Kindly return a stamped copy.

Very Truly Yours,

McDevitt & Miller LLP

Dean J. Miller

DJM/hh

ORIGINAL

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Attorney for United Water Idaho Inc.

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE JOINT APPLICATION OF UNITED WATER IDAHO INC., AND THE CITY OF BOISE, IDAHO FOR APPROVAL OF AN AGREEMENT FOR REPLACEMENT AND OPERATION OF FIRE HYDRANTS AND RELATED RATE MAKING TREATMENT	**Case No. UWI-W-15-02** **REPLY COMMENTS OF UNITED WATER IDAHO INC.**

COMES NOW United Water Idaho Inc., ("United Water"), pursuant to Order No. 33300, and submits the following Reply Comments in response to Comments of the Commission Staff dated July 23, 2015.

Introduction and Summary of Argument

For over one hundred years United Water and its predecessors have provided domestic water service to the citizens of the City of Boise ("Boise", or "City"). About eighty five percent (85%) of United Water customers are residents of Boise. As part of its obligation of service, United Water has designed and constructed its system so as to provide adequate fire protection to its customers and the City of Boise.

But, for reasons that are lost in history, United Water does not own or maintain the 6,700 fire hydrants—an obviously critical component of a fire protection system—located within the City. (Staff Comment, pg. 6). They are owned and maintained by the City. This arrangement is an anomaly. In almost every other circumstance of which United Water is aware, the entity that provides fire protection also owns and operates the hydrants, for obvious reasons. (Direct Testimony, Gregory P. Wyatt, pg. 4; Direct Testimony of Neal Oldemeyer, pgs. 3-5).

In 2012 the Mayor and Council of the City, the elected representatives of most of the same people who are United Water customers, determined it would be in the best interests of their constituents to transfer ownership and operation of hydrants to the entity better suited to operate and maintain them—United Water. (Direct Testimony, Gregory P. Wyatt, pg. 2).

United Water, as is its practice, began exploring ways to accommodate the preferences of elected public officials to the extent it could do so consistent with its other public utility obligations. (Direct Testimony, Gregory P. Wyatt, pg. 2).

The parties eventually reached an agreement which is the subject of this Application. In essence, United Water will fund the replacement of existing City fire hydrants within United Water's certificated area over an approximate forty-year (40) time frame resulting in United Water assuming ownership and responsibility for the hydrants on a newly installed basis. (*Agreement for Replacement and Operation of Fire Hydrants*, Exhibit 1, Application).

Mr. Wyatt more fully explained the rational for the forty-year (40) transition in response to Staff Production Request No. 6:

> "When the City of Boise first approached United Water they proposed the concept of immediately transferring all City-owned hydrants to United Water. United Water determined that the immediate transfer of all hydrants was not in the best interest of the Company or its customers. This determination was based on the unknown amount of potential risk and liability associated with a set of assets (hydrants) of undetermined condition, quality, or age. A contributing consideration was the associated operations

and maintenance (O&M) costs. The Company determined that it was in the best interest of customers to not take on the full O&M costs immediately, but to grow into those costs over time.

Based on that recognition, the City of Boise and United Water continued to negotiate and finally agreed to the transfer on a newly installed basis. This insures that United Water takes responsibility only for new facilities that have been installed and inspected in accordance with the Company's requirements. This significantly reduces the risk and liability to United Water and its customers related to these assets. It also enables the full O&M costs to be incurred more slowly and over a longer period of time, which is beneficial to customers."

The rate impact to United Water customers is small. In the first year it will be approximately $1.45 per customer per year, or about $0.24 per bi-monthly bill. Over the entire life of the replacement program the net present value of the cumulative revenue requirement per customer is approximately $118. (Staff Comments, pg. 11). Fire hydrants are non-revenue producing assets and United Water will not realize new revenue from the replacement program. The only financial benefit to United Water is the opportunity to earn a return on the investment in fire hydrants as it grows over time. As shown below the hydrant investment and associated return is small compared to United Water's total utility plant investment.

In short, the Agreement achieves a sensible balance between transferring hydrant ownership to the more appropriate entity while minimizing rate impacts over a long period of time.

Notwithstanding this, Staff Comments recommend that the Commission not approve the Agreement. After consideration of Staff's arguments, United Water still believes the Agreement is consistent with the public interest and should be approved, for the reasons discussed below.[1]

[1] United Water will acquiesce in one Staff recommendation regarding rate making treatment if the Agreement is approved, as discussed below.

Standard for Evaluation of Application

The Staff Comments do not attempt to articulate the legal standard by which the Application should be evaluated and focus almost exclusively on ratepayer cost (in an incomplete way, as discussed below).

The Commission, however, has broader mandate to take into account all relevant factors, of which cost is one, to determine if the Application is consistent with the public interest.

> "In general, where the Commission is required to consider the "public interest", it must look to "the interest of the public, their needs and necessities and location and, in fact, all the surrounding facts and circumstances to the end that the people be adequately served". *Browning v. Wood*, 99 Idaho 174, 579 P.2d 120 (1978) (motor carrier case); *See also, IPUC Order No. 28213,* Case No. PAC-E-99-1.

This public interest standard is consistent with the statutory duty of a utility to maintain adequate service:

> "Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public, and as shall be in all respects adequate, efficient, just and reasonable" Idaho Code §61-302.

The statute does not require service be provided at lowest possible cost but takes into account broader concepts of "safety, health, comfort, convenience of patrons employees and public".

Staff Comments Present an Incomplete Cost Picture

Staff Comments, at pages 10-12, contain a discussion of costs to United Water ratepayers. On May 22, 2015 United Water, in response to Staff Production Request No. 2 provided to Staff an Excel based model that computed annual revenue requirements over the life of the replacement cycle. Staff has used those values, without change, shown in that model in its discussion of costs, so United Water does not dispute the numbers in the Staff Comments.

However, Staff Comments make no effort to place those numbers in an overall perspective. For example:

- Staff correctly notes that the first year revenue requirement per customer is $1.45, but fails to note that average revenue per customer is $515.16, so the percent increase per customer is only a mere .18%.
- Even assuming that revenue per customer of $516.16 remains constant over the 80-year life, that annual percent increase never exceeds 5%, and that does not occur until year 40.

  The average annual revenue requirement impact per customer would average $13.12 annually or only 2.54% (over the 80 years).

Along similar lines, Staff argues that United Water will benefit from the Agreement from the opportunity to earn upon a larger rate base. (Staff Comments, pg. 13). However, Staff fails to put the incremental earning potential in context. In United Water's general rate case now pending (Case No. UWI-W-15-1), Exhibit 11, Schedule 1, shows a current rate base of $173,322,068. The expected annual fire hydrant investment of $765,000 is 0.44% of rate base. A .44% increase in earning potential is not something that shocks the conscience, to put it mildly.

As shown above, the incremental increased earnings potential resulting from hydrant acquisition is quite small compared to total rate base and total earnings. Further, hydrants are not—as Staff admits—revenue producing assets. United Water will not realize additional revenue from the replacement program. The modest additional earning potential was not the motivating factor behind United Water's participation in the hydrant transfer Agreement.

Staff Understates the Complexity of Fire Hydrants

At page 6, Staff Comments state, "fire hydrants are very simple devices that require very little expertise to operate". This statement is offered—without any evidence to support it—to bolster Staff's view that it does not make much difference whether Boise or United Water owns and operates the hydrants. (Staff Comments, pg. 7).

This statement may be semi-accurate, compared, say, to a nuclear reactor. But a fire hydrant—despite its outward appearance—is a more complicated device than Staff understands. Attached as Exhibit A are schematic diagrams of four different hydrant types that are currently in service on United Water's system. As can be seen from these diagrams, the maintenance and repair of these devices is not something you would entrust to someone with very little expertise and hydrants are not simple devices.

In fact, The American Water Works Association (AWWA), the standards setting body for the water utility industry, has published an entire manual, *Installation, Field Testing and Maintenance of Fire Hydrants M17* relating to the operation of hydrants, a portion of which is attached as Exhibit B.

The Agreement incorporates many of the AWWA maintenance and operation standards to ensure adherence to them over time. (Agreement, Paragraph 1(f)). United Water personnel are trained in the AWWA procedures and United Water maintains and operates hydrants in accordance with these industry best practices. This is in contrast to the current practice of Boise, which assigns on-duty firemen to maintenance duties.

Along these lines, in response to Staff Production Request No. 3, Mr. Wyatt further explained the benefit of hydrant ownership by United Water:

> "As reflected in Mr. Oldemeyer's filed testimony (page 7, lines 17-21), if the proposal is approved, United Water customers will benefit from having the oversight and maintenance of the hydrants managed by United Water which has demonstrated water distribution system (including hydrants) operating and maintenance experience and expertise. For many years United Water has owned and operated a fleet of over 1,000 fire hydrants in its service area outside the City of Boise. Integrating the hydrants into United Water's system will allow the Company to integrate the operation and maintenance of those hydrants into its tracking systems (GIS & work management), contract preparation and bid processes, and current industry practices and standards to ensure operational efficiency.
>
> United Water has the financial, technical, and operational resources to ensure that fire hydrants are maintained, repaired, and/or replaced more quickly without the delay of coordinating those efforts with City of Boise personnel . As reflected in Boise City's response to Staff's First Production Request No. 5, The City of Boise uses on-duty firemen to perform inspection and maintenance, while United Water uses trained and certified water distribution system operators to perform hydrant maintenance".

United Water Customers Have Not Expressed Opposition

In its Notice of Application, issued on May 12, 2015 the Commission established a long public comment period ending July 23, 2015, a comment period of about ten weeks. The Commission also issued a press release advising customers of the Application on June 6, 2015.

During that time, the Commission received one written comment, and that commenter supported the Application.

(*See,* http://www.puc.idaho.gov/fileroom/cases/summary/UWIW1502.html)

As the Commission knows from other proceedings, members of the public know how to express their opposition to utility proposals if they desire to do so. (*See e.g.,* Case No. IPC-E-15-01).

Disparate Rate Impacts

Staff Comments observe that future recovery of hydrant related costs could impact different customers in different ways. (Staff Comments pgs. 3-4). This is true, but it is not a reason to reject the Agreement.

Under traditional principles, fire protection and hydrant costs are considered fixed and recovered through customer charges, which vary by meter size. However, in United Water's current tariff, consistent with Commission policy, a significant portion of fixed costs related to fire protection are not included in the tariff customer charge, but allocated to the volumetric rate.

Every change in utility investment has the potential to create different rate effects for different customers. In future proceedings the Commission, as it has done in the past, has adequate discretion to allocate recovery of hydrant costs in ways it thinks best to ensure fair and reasonable rates for all customers.

Franchise Fees

From its review of Staff Comments, United Water infers that Staff's opposition to the Agreement is propelled at least in part by Staff's dislike of municipal franchise fees that are collected from customers on utility bills: "Staff does not believe it should be the responsibility of United Water customers to fund the City's services for fire, police, library and parks (pg. 5); "Staff believes that a reduction in franchise fees would provide equity for the increase in cost that will be borne by ratepayers", (pg. 9).

United Water understands some of these concerns. From a utility perspective franchise fees create an administrative burden of billing, collection and remittance. And they increase the perceived cost of water sold to customers.

But, as Boise points out in its Reply Comments, the franchise fee system in place in Idaho is authorized by both the Idaho State Constitution (Art. XV Sec. 2) and Idaho State Statute (Idaho Code §50-329 *et. seq).* The Commission, as a body of limited jurisdiction, lacks authority to regulate or direct the affairs of a municipal corporation. (*See,* Idaho Code §61-104—municipal corporation is not a "corporation" within the meaning of the Public Utility Law; *Ada County Highway District v. Idaho Public Utilities Commission,* 151 Idaho, 1, 253 P.3d 675 (2011)—Commission may not regulate activities of entities not subject to its jurisdiction.

Staff's dislike of a system that neither it nor the Commission can either change or regulate is not a solid reason for rejecting an otherwise sensible agreement.

Accounting/Ratemaking Treatment

In its Application (paragraph 10) United Water requested two ratemaking treatments:

> "United Water requests a determination by the Commission that the investments incurred in conformity with the Agreement are prudently incurred and that the Commission provide an assurance that they will be fully included in rate base (not 13-month averaged) and in rates in United Water's subsequent general rate proceedings over the life of the Agreement. United Water proposes the Commission allow the Company to continue the calculation and accrual of post-closing AFUDC on the investments anticipated by the Agreement until such time as those investments are fully accounted for and included in rates in subsequent general rate case determinations over the life of the Agreement".

Staff Comments (pgs. 12-13) support the first request—year end rate base—noting that hydrants are neither revenue producing nor expense reducing.

Staff Comments oppose accrual of AFUDC. Without conceding the logic of Staff's position, United Water hereby withdraws its request for post-closing AFUDC accrual.

Conclusion

Taking into account all relevant factors the Commission should find that the Agreement is consistent with the public interest and should approve it, along with United Water's requested ratemaking treatment, as modified.

DATED this 14 day of August, 2015.

UNITED WATER IDAHO INC.

By: _____
Dean J. Miller
Attorney for United Water Idaho Inc.

CERTIFICATE OF SERVICE

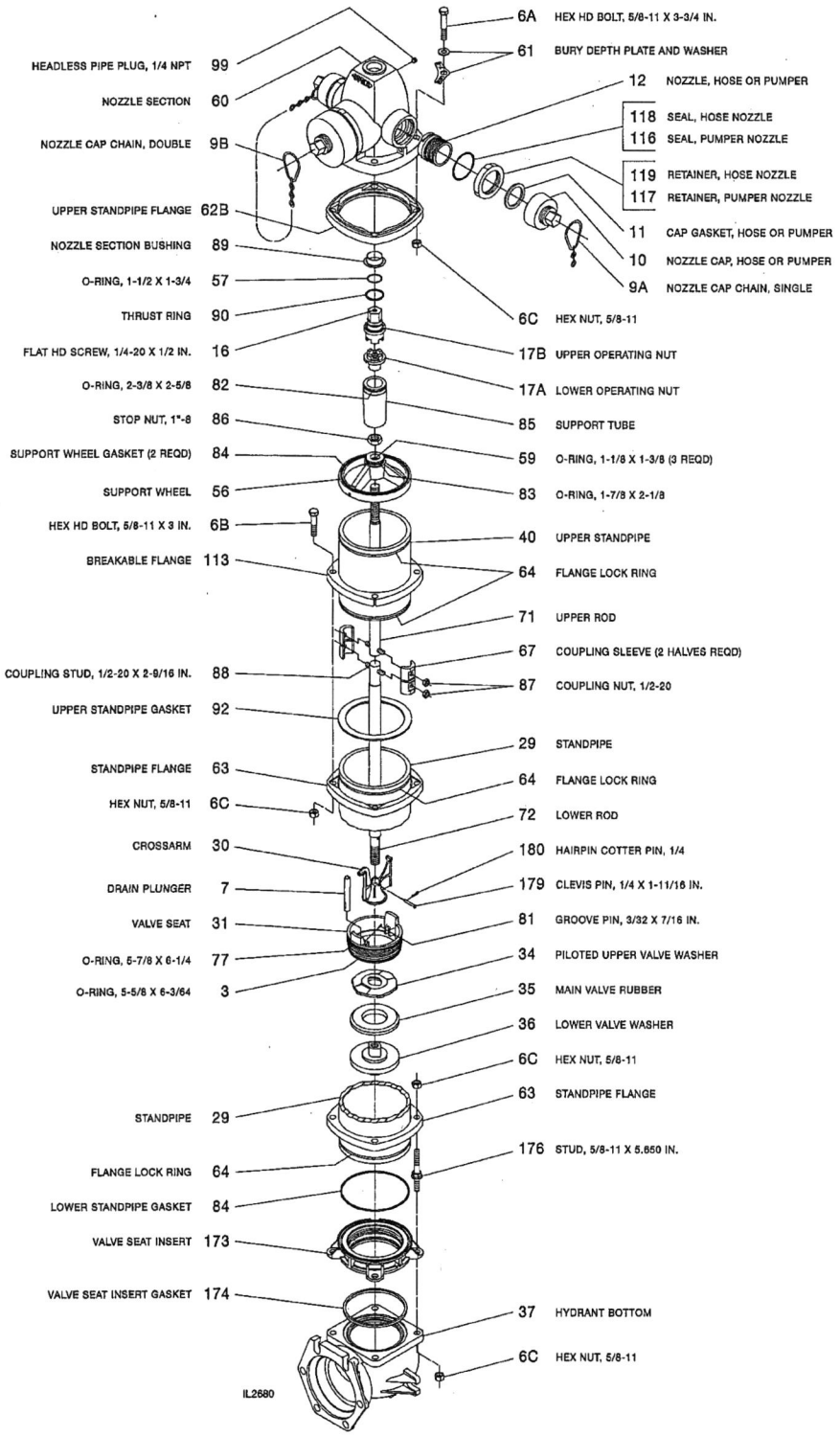
I hereby certify that on the 13th day of August, 2015, I caused to be served, via the method(s) indicated below, true and correct copies of the foregoing document, upon:

Jean Jewell, Secretary Idaho Public Utilities Commission 472 West Washington Street P.O. Box 83720 Boise, ID 83720-0074 jjewell@puc.state.id.us	Hand Delivered U.S. Mail Fax Fed. Express Email	X
Brandon Karpen Deputy Attorney General Idaho Public Utilities Commission P.O. Box 83720 Boise, Idaho 83720-0074 Brandon.Karpen@puc.idaho.gov	Hand Delivered U.S. Mail Fax Fed. Express Email	X
Douglas K. Strickling Boise City Attorney's Office P.O. Box 500—83701 150 North Capitol Boulevard Boise, Idaho 83702 dstrickling@cityofboise.org	Hand Delivered U.S. Mail Fax Fed. Express Email	X

BY: Heather Houle, Legal Asst.
McDEVITT & MILLER LLP

AMERICAN FLOW CONTROL

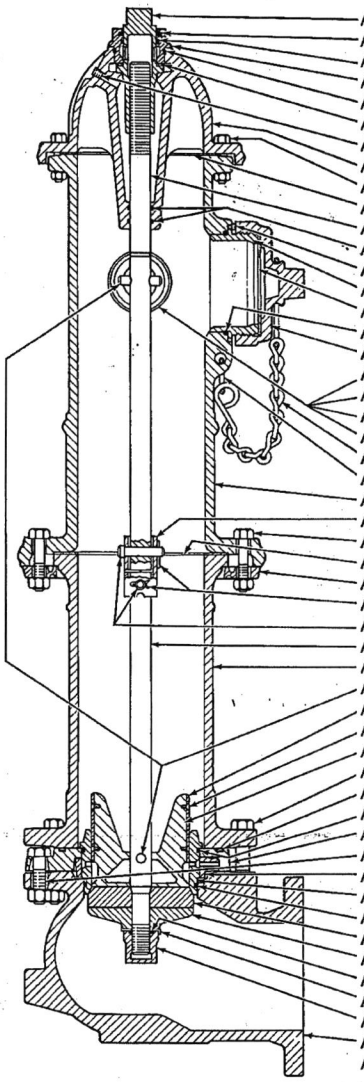
WATEROUS PACER HYDRANT MODEL WB67-250



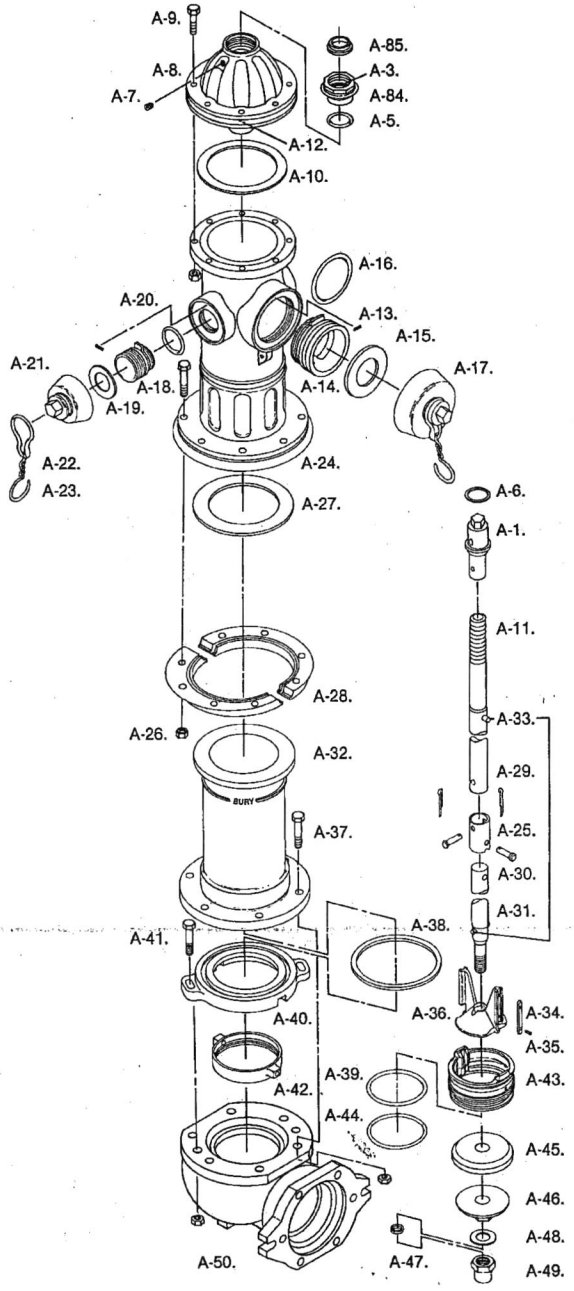
AMERICAN-DARLING VALVE
P.O. BOX 2727
BIRMINGHAM, ALABAMA 35207

WATEROUS COMPANY
125 HARDMAN AVENUE SOUTH
SOUTH ST. PAUL, MINNESOTA 55075

FIRE HYDRANT
PARTS LIST



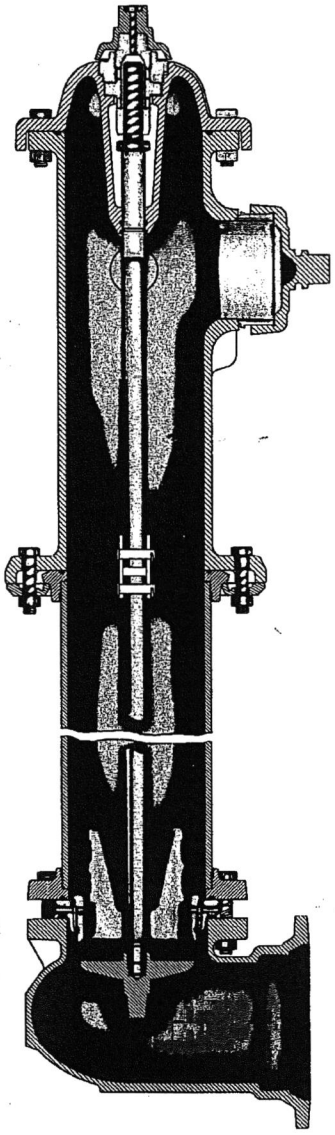
A-1. Operating Nut
A-85. Weather Seal
A-3. Hold Down Nut O-Ring[1]
A-84. Hold Down Nut
A-5. Bonnet O-Ring[1]
A-6. Anti-Friction Washer[1]
A-7. Oil Filler Plug
A-8. Bonnet
A-9. Bonnet Bolt & Nut
A-10. Bonnet Gasket[1]
A-11. Upper Stem
A-12. Stem O-Rings[1]
A-13. Nozzle Locks (Pumper & Hose)
A-14. Pumper Nozzle
A-15. Pumper Nozzle Gasket
A-16. Pumper Nozzle O-Ring
A-17. Pumper Nozzle Cap
A-18. Hose Nozzle
A-19. Hose Nozzle Gasket
A-20. Hose Nozzle O-Ring
A-21. Hose Nozzle Cap
A-22. Chain
A-23. Chain Connector Ring
A-24. Upper Barrel
A-25. Safety Stem Coupling[4]
A-26. Safety Flange Bolt & Nut[4]
A-27. Safety Flange Gasket[4]
A-28. Safety Flange[4]
A-29. Cotter Pin[4]
A-30. Clevis Pin[4]
A-31. Lower Stem
A-32. Lower Barrel
A-33. Stem Pin
A-34. Drain Valve Facing[2]
A-35. Drain Valve Facing Screw[2]
A-36. Upper Valve Plate
A-37. Shoe Bolt & Nut[2]
A-38. Drain Ring Housing Gasket[2]
A-39. Top Seat Ring O-Ring[2,3]
A-40. Drain Ring Housing
A-41. Drain Ring Housing Bolt & Nut[2]
A-42. Drain Ring
A-43. Seat Ring[3]
A-44. Bottom Seat Ring O-Ring[2,3]
A-45. Main Valve[2,3]
A-46. Lower Valve Plate
A-47. Cap Nut Seal[2,3]
A-48. Lock Washer[2]
A-49. Cap Nut
A-50. Shoe
A-51. Hydrant Lubricating Oil[1,4]



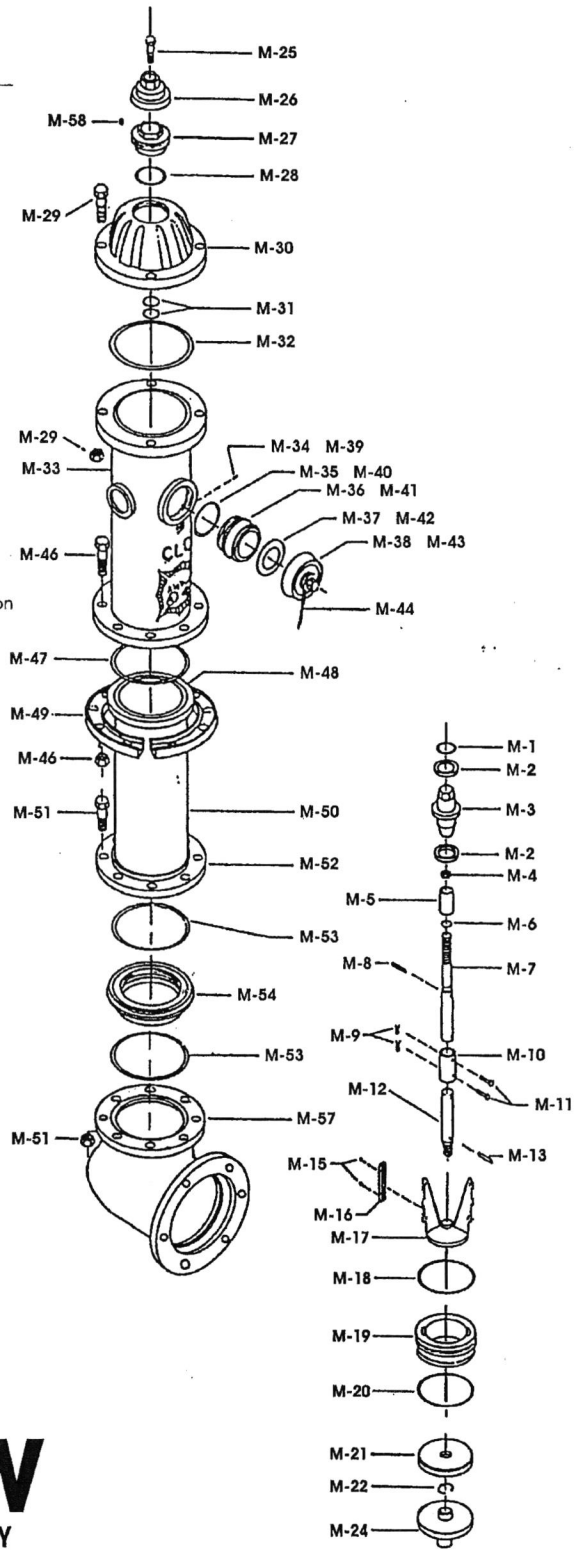
TO ORDER PARTS SPECIFY:
QUANTITY, PART NUMBER AND NAME, SIZE AND CATALOG NUMBER OF
HYDRANT, DIRECTION OF OPENING, DEPTH OF BURY, YEAR DATE CAST ON

Part at Nampa Consolidated Supply
463-9909

PARTS LIST

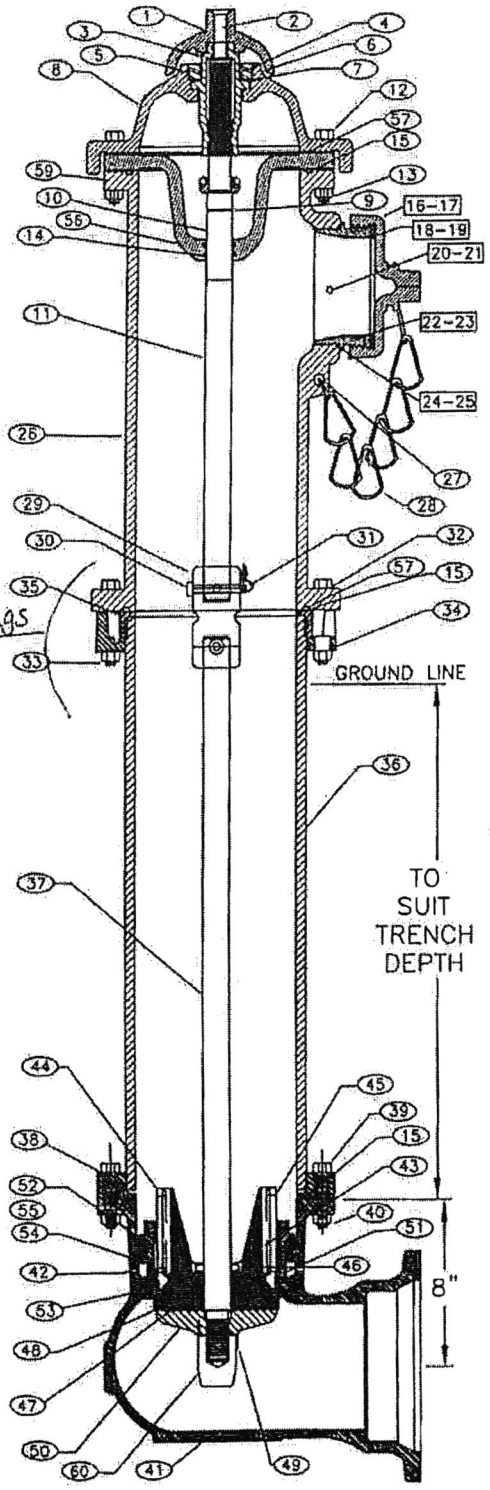


Det.	Qty.	Description	Material
M-1	1	Operating Nut O-Ring	NBR
M-2	2	Operating Nut Thrust Bearings	Delrin
M-3	1	Operating Nut	Bronze
M-4	1	Upper Stem Jam Nut (Option)	Zinc Plated Steel
M-5	1	Upper Stem Sleeve	Bronze
M-6	1	Upper Stem Sleeve O-Ring	NBR
M-7	1	Upper Stem	CRS
M-8	1	Upper Stem Pin	Stainless Steel
M-9	2	Safety Coupling Cotter Pins	Stainless Steel
M-10	1	Safety Stem Coupling	Steel Tubing
M-11	2	Safety Coupling Pins	Stainless Steel
M-12	1	Lower Stem	CRS
M-13	1	Lower Stem Pin	Stainless Steel
M-15	4	Drain Valve Facing Pins	Stainless Steel
M-16	2	Drain Valve Facing	Rubber
M-17	1	Upper Valve Plate	Bronze
M-18	1	Seat Ring Upper O-Ring	NBR
M-19	1	Seat Ring	Bronze
M-20	1	Seat Ring Lower O-Ring	NBR
M-21	1	Main Valve Rubber	Rubber
M-22	1	Lower Valve Plate Lockwasher	Stainless Steel
M-24	1	Lower Valve Plate	Bronze or Cast Iron
M-25	1	Weather Cap Hold Down Screw	Zinc Plated Steel
M-26	1	Weather Cap	Cast Iron
M-27	1	Thrust Nut	Bronze
M-28	1	Thrust Nut O-Ring	NBR
M-29	4	Bonnet Bolts & Nuts	Zinc Plated Steel
M-30	1	Bonnet	Cast Iron
M-31	2	Stem O-Rings	NBR
M-32	1	Bonnet O-Ring	NBR
M-33	1	Nozzle Section	Cast Iron
M-34	1	Pumper Nozzle Lock	Stainless Steel
M-35	1	Pumper Nozzle O-Ring	NBR
M-36	1	Pumper Nozzle	Bronze
M-37	1	Pumper Nozzle Gasket	Rubber
M-38	1	Pumper Nozzle Cap	Cast Iron
M-39	2	Hose Nozzle Lock	Stainless Steel
M-40	2	Hose Nozzle O-Ring	NBR
M-41	2	Hose Nozzle	Bronze
M-42	2	Hose Nozzle Gasket	Rubber
M-43	2	Hose Nozzle Cap	Cast Iron
M-44	1	Chain	Zinc Plated Steel
M-46	8	Safety Flange Bolts & Nuts	Zinc Plated Steel
M-47	1	Safety Flange O-Ring	NBR
M-48	1	Barrel Upper Flange	Ductile Iron
M-49	2	Safety Flange	Ductile Iron
M-50	1	Barrel	Ductile Iron Pipe
M-51	8	Shoe Bolts & Nuts	Zinc Plated Steel
M-52	1	Barrel Lower Flange	Ductile Iron
M-53	2	Drain Ring O-Rings	NBR
M-54	1	Drain Ring	Bronze
M-57	1	Shoe	Ductile Iron
M-58	1	Thrust Nut Setscrew	Stainless Steel



CLOW
VALVE COMPANY
902 South 2nd Street • Oskaloosa, Iowa 52577
Phone 641-673-8611 Fax 641-673-8269
http://clowvalve.com

M&H MODEL 929 FIRE HYDRANT



ITEM #	QTY	DESCRIPTION	MATERIAL
1	1	WEATHER SHIELD	CAST IRON ASTM A-126, CLASS B
2	1	LUBRICATION PLUG BOLT 1/2 x 2 1/4	ELECTRO ZINC PLATED STEEL
3	1	OPERATING NUT	BRONZE ALLOY CDA 84400 ASTM B-584
4	1	HOLD DOWN NUT "O" RING	N.B.R.
5	1	HOLD DOWN NUT	BRONZE ALLOY CDA 84400 ASTM B-584
6	1	HOLD DOWN NUT SET SCREW	18-8 SS ASTM F-593 GROUP 1
7	1	THRUST WASHER	NYLON
8	1	BONNET	CAST IRON ASTM A-126 CLASS B
9	*1	BRONZE STEM SLEEVE "O" RING	N.B.R.
10	*1	BRONZE STEM SLEEVE	BRASS TUBING, ASTM B-135 ALLOY NO. 2
11	1	UPPER ROD/STEM ASSEMBLY	STEEL C1117 HFS w/BRZ STEM SLEEVE
12	3	BONNET BOLTS 1/2-13 x 3	ELECTRO ZINC PLATED STEEL
13	6	BONNET / SEAL PLATE NUTS 1/2-13	ELECTRO ZINC PLATED STEEL
14	2	LOWER BONNET STEM "O" RINGS	N.B.R.
15	3	NOZZLE/STAND PIPE "O" RINGS	N.B.R.
16	2	HOSE NOZZLE CAP	CAST IRON ASTM A-126, CLASS B
17	1	PUMPER NOZZLE CAP	CAST IRON ASTM A-126, CLASS B
18	2	HOSE NOZZLE CAP GASKET	RUBBER ASTM D2000
19	1	PUMPER NOZZLE CAP GASKET	RUBBER ASTM D2000
20	2	HOSE NOZZLE SET SCREW	18-8 SS ASTM F-593 GROUP 1
21	1	PUMPER NOZZLE SET SCREW	18-8 SS ASTM F-593 GROUP 1
22	2	HOSE NOZZLE 2 1/2	BRONZE ALLOY CDA 84400 ASTM B-584
23	1	PUMPER NOZZLE 4 1/2	BRONZE ALLOY CDA 84400 ASTM B-584
24	2	HOSE NOZZLE "O" RING	N.B.R.
25	1	PUMPER NOZZLE "O" RING	N.B.R.
26	1	NOZZLE SECTION	CAST IRON ASTM A-126, CLASS B
27	1	"S" HOOK	ELECTRO ZINC PLATED STEEL
28	1	NOZZLE CAP CHAINS	ELECTRO ZINC PLATED STEEL
29	1	SAFETY STEM COUPLING/BREAK COUPLING	CAST IRON ASTM A126, CLASS B
30	2	CLEVIS PIN 3/8 x 2 1/2	410 STAINLESS STEEL
31	2	RETAINING CLIP	18-8 SS ASTM F-593 GROUP 1
32	6	SAFETY LUG BOLTS 5/8-11 X 4	ELECTRO ZINC PLATED STEEL
33	6	SAFETY LUG NUTS 5/8-11	ELECTRO ZINC PLATED STEEL
34	6	SAFETY LUGS	CAST IRON ASTM A126, CLASS B
35	*1	STAND PIPE UPPER FLANGE	DUCTILE IRON
36	1	STAND PIPE	DUCTILE IRON PIPE
37	1	LOWER ROD / LOWER STEM	STEEL C1117 HFS
38	*1	STAND PIPE LOWER FLANGE	DUCTILE IRON
39	8	SHOE BOLTS 5/8-11 x 3 1/2	304 STAINLESS STEEL
40	8	SHOE BOLT NUTS 5/8-11	304 STAINLESS STEEL
41	1	HYDRANT SHOE/ELBOW	DUCTILE IRON ASTM A-536, GRADE 70-50-5
42	2	DRAIN HOLE BUSHINGS	BRONZE ASTM B-135
43	1	UPPER DRAIN VALVE/UPPER VALVE PLATE	ALUMINUM-BRONZE ALLOY ASTM B-763
44	2	DRAIN VALVE FACINGS	BUNA S
45	8	DRAIN VALVE FACING RIVETS	COPPER
46	1	LOWER STEM PIN 1/2 X 1 3/4	18-8 STAINLESS STEEL TYPE E
47	1	LOWER STEM "O" RING SEAL	N.B.R.
48	1	MAIN VALVE RUBBER/SEAT	S.B.R.
49	1	LOWER VALVE PLATE LOCKING WASHER	18-8 STAINLESS STEEL TYPE E
50	1	LOWER VALVE PLATE/BOTTOM PLATE	CAST IRON ASTM A-126, CLASS B
51	1	BRONZE MAIN VALVE SEAT RING	ALUMINUM-BRONZE ALLOY ASTM B-763
52	1	MAIN VALVE SEAT RING UPPER "O" RING	N.B.R.
53	1	MAIN VALVE SEAT RING LOWER "O" RING	N.B.R.
54	*1	SHOE RETAINER RING	BRONZE ALLOY CDA 8440, ASTM B-584
55	*1	SHOE RETAINER RING "O"-RING	N.B.R.
56	1	SEAL PLATE	CAST IRON ASTM A-126, CLASS B
57	1	SEAL PLATE GASKET	RUBBER
58	1	STOP NUT	BRONZE
59	3	SEAL PLATE BOLTS 1/2 X 2	ELECTRO ZINC PLATED STEEL
60	1	LOWER STEM CAP NUT	CAST IRON ASTM A-126, CLASS B

* NOT FIELD REPLACEABLE - PERMANENTLY INSTALLED

MAIN VALVE SIZES AVAILABLE: 5 1/4"

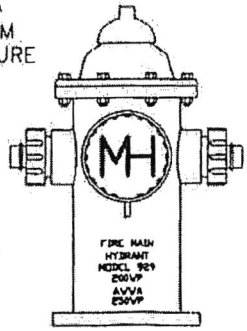
MEETS OR EXCEEDS AWWA C502

250 PSI WORKING PRESSURE AWWA
200 PSI WORKING PRESSURE UL/FM
500 PSI HYDROSTATIC TEST PRESSURE

HYDRANT SHOE STYLES AVAILABLE:
6" - MECHANICAL JOINT
6" - FLANGED

LISTED
UL 888H

FM APPROVED



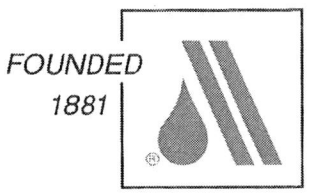
M&H VALVE COMPANY
ANNISTON, ALABAMA
A DIVISION OF MCWANE INC.

DWN: TRIJ
DATE: 7/1/05
DWG. NO. FH-929

Installation, Field Testing, and Maintenance of Fire Hydrants

AWWA MANUAL M17

Third Edition



American Water Works Association

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Contents

Foreword

This manual was prepared by the AWWA Standards Committee on Fire Hydrants. It is intended for use by persons responsible for the installation, operation, and maintenance of dry-barrel and wet-barrel fire hydrants. It is the second revision of the original manual, which was published in 1970.

The diversity of hydrants and the detailed maintenance procedures recommended by specific manufacturers make it difficult to develop a text that is both comprehensive and concise. Therefore, this manual is intended to be used as a supplement to detailed information available from specific hydrant manufacturers.

It is the judgment of the committee that the major purpose and function of a fire hydrant is public fire protection. Usually, the hydrant is the property or responsibility of the water utility. However, during fire emergencies the hydrant is operated by members of a fire department rather than by water utility personnel.

The use of a fire hydrant as a source of water for street cleaning, construction projects, or for any purpose other than fire fighting is outside the primary purpose for which a hydrant is installed. Such uses should be rigidly restricted and controlled in the interest of keeping the fire hydrant in good working order for fire fighting.

The water utility, unless expressly relieved of its responsibility by the fire department in accordance with a written agreement, public ordinance, or other ownership, should schedule regular and sufficiently frequent inspections of hydrants to ensure they are in good working condition.

Additional AWWA publications on hydrants include AWWA C502, Standard for Dry-Barrel Fire Hydrants, and AWWA C503, Standard for Wet-Barrel Fire Hydrants. The bulk of the material in this manual refers to hydrants claimed by the respective manufacturers to be manufactured in accordance with AWWA C502 and AWWA C503; however, information is also included on hydrants that are not intended to comply with these standards, such as high-pressure and flush-type hydrants. Installation practices described are consistent with AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances.

* * *

This manual was reviewed and approved by the AWWA Standards Committee on Fire Hydrants. Members of that committee, at the time of approval, were as follows:

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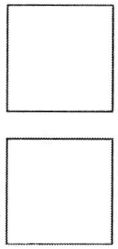
The AWWA Standards Committee on Fire Hydrants gratefully acknowledges the contributions made by members of the M17 Subcommittee in preparing this manual. The committee's efforts in developing this manual answer the need for expanded information on fire hydrants for the industry.

Appreciation is expressed to Ray Jackson, a past chairman of the AWWA Standards Committee on Fire Hydrants, whose personal dedication and leadership as chairman of the committee made various AWWA publications a reality. Appreciation is also extended to E.E. "Skeet" Arasmith, chairman of the M17 Subcommittee, who served to make this greatly expanded edition of M17 as comprehensive and up-to-date as possible.



Chapter 5

Maintenance

To ensure that a hydrant will work correctly when it is needed, a periodic testing and maintenance program must be followed. Although hydrants are operated by members of the fire department, it is generally the water utility's responsibility to maintain them in working order.

In many small communities, especially where the water purveyor is not the same political entity as the fire department, agreements have been made with the individual fire departments to maintain and test fire hydrants. While this practice is worthwhile, it should be remembered that unless there is a verifiable agreement, the owner of the hydrant retains the responsibility for maintenance and inspection of the hydrant.

5.1 USES OF HYDRANTS

The primary purpose of a fire hydrant is fire suppression. However, hydrants also serve other useful functions. For example, hydrants provide a method of testing the distribution system's flow capabilities. They also provide a means for flushing the system mains, for street cleaning and sewer cleaning, for street and building construction, and for recreation.

While each of these functions might be of great importance to certain individuals or groups, the primary purpose—fire suppression—is paramount. Hydrant owners have a moral obligation to see that adequate fire flow can be delivered from every hydrant under their jurisdiction. If adequate flow cannot be delivered by a particular hydrant, then that hydrant is not fulfilling the primary purpose. If that is the case, the hydrant should be removed. A hydrant signifies to the public that water for fighting fires is available.

5.2 SPECIAL-USE CONCERNS

When the main valve of a dry-barrel hydrant is left partially open, substantial amounts of water may leak through the drain valves. Depending on the volume of leakage and the soil in which the hydrant is located, the results can be relatively minor or catastrophic. For example, a hydrant with the main valve left partially open

hydrant. Repair will require digging down around the outside of the hydrant and clearing the drain outlet.

4.4 PLACING THE HYDRANT IN SERVICE

The following steps are recommended for placing a hydrant in service.

1. After testing and backfilling, the hydrant should be flushed and tested to be sure that it is bacteriologically safe before it is put into service.
2. Tighten the outlet-nozzle caps. Back them off slightly so they will not be excessively tight, but tight enough to prevent their removal by hand.
3. Clean the hydrant exterior to remove dirt accumulated during installation. If necessary for protection or appearance, the exposed portion of the hydrant should be painted with one or more coats of the utility's standard paint.

located in easily saturated soil will fail to drain properly after main valve closure. Excessive leakage can undermine a hydrant located in soil that is easily washed away.

When in use, the main valve of a dry-barrel hydrant should always be completely opened to ensure that the drain valve is closed. Instructions to this effect should be given to all persons authorized to use the hydrants, including fire fighters, contractors, street cleaners, and summer playground supervisors. (An isolation valve should be connected to the hose nozzle each time the hydrant is used for purposes other than fire fighting. This allows the user to control the flow without moving the main valve.)

When hydrants are repeatedly used as a water source during new construction, the owner must consider ways to protect the hydrant, protect the water from contamination through backflow, and also control consumption. Adequate protection and control can be achieved through installation of a hose gate on the outlet nozzle, a hydrant meter, and an acceptable backflow-prevention device. When the hydrant is in use, the main valve must be left in the fully open position. Users should be instructed to control flow through the hose gate on the outlet nozzle instead of operating the main valve.

The use of hydrants to fill street sweepers, sewer-flushing trucks, and sewer high-velocity cleaners requires special attention. The connection of a hose from the hydrant to the truck, even through a check valve, is considered a cross connection and therefore hazardous. Hydrant owners may require each truck to have an acceptable in-line backflow-prevention-device connection. Another solution is to identify watering points that can be protected by backflow-prevention devices, such as reduced-pressure devices (RPD) and/or air gaps.

In all communities, hydrants are occasionally used by unauthorized individuals. When unauthorized use of hydrants becomes a problem, special control techniques may be required. Common control techniques involve legal action and penalties against the offenders and the installation of special operating nuts and nozzle caps that can be operated only with special wrenches. The special operating nut and wrench designs make it difficult to remove outlet-nozzle caps or to operate the hydrant with standard tools.

Occasionally, a hydrant is installed where vehicular traffic inflicts repeated damage to the hydrant. Under such a condition, it is best to move the hydrant. However, if that is not possible the hydrant may be protected by installing a barrier of vertical pipes or steel rods approximately 3 ft (1 m) from the hydrant.

5.3 INSPECTION

All hydrants should be inspected regularly, at least once a year, to ensure their satisfactory operation. In freezing climates, dry-barrel hydrants may require two inspections per year. A common technique is to perform one inspection in the fall and another in the spring. In severe freezing conditions, periodic winter inspections may also be required. Winter inspections are especially important for dry-barrel hydrants that are installed in areas with high groundwater levels (whether or not the drain outlet is plugged).

It is advisable to inspect all types of hydrants after each use. Dry-barrel hydrants with permanently plugged drains must be pumped out after each use and then inspected. During freezing conditions, after-use inspections are especially important for dry-barrel hydrants.

To reduce manpower, inspection crews should be equipped to repair all hydrants at the time of inspection. However, some jurisdictions prefer to have hydrants inspected by one person and repaired by a follow-up crew.

Dry-Barrel Hydrant Inspection Procedure

1. Check the hydrant's appearance. Remove obstructions around it. If paint is needed, either paint the hydrant or schedule it for painting. Check to see whether the hydrant needs to be raised because of a change in the ground-surface grade. If adjustments are needed, schedule the work.
2. Remove one outlet-nozzle cap and use a listening device to check for main-valve leakage.
3. Using a plumb bob, check for the presence of water or ice in the hydrant barrel.
4. Replace the outlet-nozzle cap. Leave it loose enough to allow air to escape.
5. Open the hydrant only a few turns. Allow air to vent from the outlet-nozzle cap.
6. Tighten the outlet-nozzle cap.
7. Open the hydrant fully. Check for ease of operation. Certain water conditions may cause hard-water buildup on the stem threads of toggle and slide-gate hydrants and on the threads of wet-top hydrants. Opening and closing the hydrant repeatedly usually removes this buildup. If the hydrant has no threads in the water, but operates with difficulty, check the lubrication before proceeding with the inspection. Other problems that may make operation difficult are stuck packing and bent stems.
8. With the hydrant fully open, check for leakage at flanges, around outlet nozzles, at packing or seals, and around the operating stem. Repair as needed.
9. Partially close the hydrant so the drains open and water flows through under pressure for about 10 s, flushing the drain outlets.
10. Close the hydrant completely. Back off the operating nut enough to take pressure off of the thrust bearing or packing.
11. Remove an outlet-nozzle cap.
12. Attach a section of fire hose or other deflector to protect the street, traffic, and private property from water expelled at high velocity. (See warning about rigid diverters in Sec. 6.6.)
13. Open the hydrant and flush to remove foreign material from the interior and lead.
14. Close the hydrant. Remove the deflector and check the operation of the drain valve by placing the palm of one hand over the outlet nozzle. Drainage should be sufficiently rapid to create noticeable suction. For no-drain hydrants, pump the water from the barrel.
15. Using a listening device, check the main valve for leakage.
16. Remove all outlet-nozzle caps, clean the threads, check the condition of the gaskets, and lubricate the threads. (Graphite powder in oil works well, as do several of the never-seize compounds.) Check the ease of operation of each cap.
17. Check outlet-nozzle-cap chains or cables for free action on each cap. If the chains or cables bind, open the loop around the cap until they move freely. This will keep the chains or cables from kinking when the cap is removed during an emergency.
18. Replace the caps. Tighten them, and then back off slightly so they will not be excessively tight. Leave them tight enough to prevent their removal by hand.
19. Check the lubrication of operating-nut threads. Lubricate per the manufacturer's recommendations.
20. Locate and exercise the auxiliary valve. Leave it in the open position.
21. On traffic-model hydrants, check the breakaway device for damage.
22. If the hydrant is inoperable, tag it with a clearly visible mark and notify the fire department. This may save fire fighters valuable time in an emergency. Schedule the hydrant for repair.

Wet-Barrel Hydrant Inspection Procedure

1. Check the hydrant's appearance. Remove obstructions around it. If paint is needed, either paint the hydrant or schedule it for painting. Check to see whether the hydrant needs to be raised because of a change in the ground-surface grade. If adjustments are needed, schedule the work.
2. Remove outlet-nozzle caps and check for valve-washer leakage.
3. Install a test outlet-nozzle cap.
4. Open each valve and test for ease of operation. If stem action is tight, open and close several times until opening and closing actions are smooth and free.
5. Clean the cap and nozzle threads. Inspect and replace damaged cap gaskets. Lubricate the nozzle threads. (Graphite powder in oil works well, as do several of the never-seize compounds.)
6. Check the outlet-nozzle-cap chains and cables for free action on each cap. If the chains or cables bind, open the loop around the cap until they move freely. This will keep the chains or cables from kinking when the cap is removed during an emergency.
7. Replace the caps. Tighten them, and then back off slightly so they will not be excessively tight. Leave them tight enough to prevent their removal by hand.
8. Locate and exercise the auxiliary valve. Leave it in the open position.
9. If the hydrant is inoperable, tag it with a clearly visible mark and notify the fire department. This may save fire fighters valuable time in an emergency. Schedule the hydrant for repair.

5.4 LUBRICATION

For detailed information on how to lubricate a particular hydrant, contact the hydrant's manufacturer. The following general guidelines should be used in conjunction with the manufacturer's recommendations.

1. Determine if the hydrant uses oil or grease on the operating threads. If the threads are exposed to water, the grease should not be water soluble.
2. In order to lubricate the threads on toggle-type hydrants, the entire operating mechanism must be removed.
3. In arctic climates, moisture in the air often will freeze the outlet-nozzle caps and operating nut. A common solution to this problem is to coat the threads and nut with antifreeze. The antifreeze should be made of a nontoxic, noncorrosive compound that is approved by the drinking water authority that has jurisdiction over potable water.

NOTE: Placing antifreeze into the barrel section of the hydrant is not recommended.

5.5 REPAIRS

Any condition that cannot be repaired easily during routine inspection should be recorded in the inspection report. The problem should also be reported for action by repair crews. Leakage, broken parts, bad operation, corrosion, and other major defects should be repaired as soon as possible after the defect is reported. If repairs are to be performed in the field, the repair crew should take a full complement of repair parts to the job site.

NOTE: Before any repair takes place, the fire department must be notified.

To obtain the exact procedure for disassembly and repair of a specific hydrant, refer to the manufacturer's maintenance manual. The following information is to be

used as a general guideline. If it appears to conflict with the manufacturer's recommendations, then the manufacturer's recommendations should be followed.

1. Close the auxiliary valve ahead of the hydrant or use another means to cut off flow and pressure to the hydrant. CAUTION: Before proceeding, open the main valve a few turns to make certain pressure to the hydrant has been cut off.
2. Disassemble the hydrant in accordance with the manufacturer's recommendations.
3. Replace damaged parts and parts that show wear, corrosion, or signs of incipient failure. Always replace all gaskets, packing, and seals.
4. Reassemble the hydrant and open the auxiliary valve (or otherwise pressurize the hydrant). Test the main valve for leakage.
5. Vent the air from the hydrant and put the entire hydrant under pressure. Check for leakage, ease of operation, and drainage.
6. Always record the repair and operating condition of the hydrant after completion of the repairs. Notify the fire department after completion of the repair.

Specific Repairs

Packing replacement. Braided or woven packing around the stem will wear out in time. Old, worn-out packing can be the source of leakage and can make it difficult to open and close the hydrant. The following guidelines may be helpful for replacing packing material.

1. Select the proper packing. In the past, the most common packing material used was asbestos graphite. Today, it is recommended that asbestos-based packing not be installed. Instead, use some form of synthetic packing material. Manufacturers of packing material and the manufacturer of the hydrant can provide guidelines on packing-material selection.
2. Locate and remove the packing gland.
3. Using a packing hook, remove all of the old packing. Never place new packing over the old.
4. Remove old material and dried-on grease from the packing gland and stuffing box.
5. Determine the size of the packing. Packing is square and is manufactured in $1/16$-in. (1.6-mm) increments. For control of leakage, the packing must be the correct size.
6. Wrap the packing around the operating nut and mark the exact length.
7. Remove the packing and cut to length along the mark.
8. Place the packing into the stuffing box, one ring at a time, seating each ring with a wooden block. The joints of the packing must be staggered at 90° intervals.
9. Replace the packing gland and tighten until it is finger tight.
10. Place the hydrant under pressure.
11. Adjust the packing gland until there is only a small amount of leakage (a trickle of water, not a stream) around the shaft.

Traffic-Model Damage

When traffic-model hydrants become damaged, follow the repair procedure listed below. In order to execute timely repair, an inventory of parts for traffic-model hydrants should be kept on hand. Extra gaskets, lubricant, O rings, and bolts should be kept on hand.

1. Notify the fire department of the outage. This should be done as soon as the damage is discovered.

2. Protect the area with proper traffic and pedestrian control. If the hydrant cannot be immediately repaired, the broken and loose components should be removed from the site and the hole covered to keep pedestrians from stepping in it.

3. Repair following the manufacturer's recommended procedure.

Adjusting hydrant height. When the height of a hydrant must be changed due to a change in street grade, it is important to first notify the fire department. Proper care must be taken to control traffic and pedestrians. Each hydrant manufacturer has a specific procedure that should be followed in changing the height.

5.6 RECORD KEEPING

In order to carry out a meaningful inspection and maintenance program, it is essential to record the location, make, type, size, and date of installation for each hydrant. Other information also may be recorded, depending on the nature of the record-keeping system used.

When a hydrant is inspected, the record should indicate the inspection date and the condition of the hydrant. If repair work is necessary, the nature of the work should be indicated. When repair work is completed, the nature of the repairs, date, and other relevant information should be recorded. Other information, such as testing, pumping, ease of operation, direction of open, and number of turns to open, is also important and should be carefully recorded. This data may be kept in hard copy or transferred to a data base on a microcomputer. It is suggested that these records be altered to meet individual needs.

Samples of record and survey sheets are shown in Figures 5-1 through 5-5. Some type of basic "master" record is necessary to give background information on hydrant type and installation (see Figure 5-1). This information will make it much easier to determine parts inventory and training requirements. This record is also useful in comparing hydrants. This is useful to determine which styles, nozzle thread sizes, and operating nuts are the most common in the system.

The center section of the master-record form allows for the accumulation of information concerning the frequency of inspections and repairs. This data is important to the Insurance Services Office and can help in determining the frequency of maintenance on a particular hydrant. A particular hydrant or type of hydrant that continues to develop the same repair problem can be systematically removed from the system. Without this type of information, it would be difficult to determine that a particular type of problem is recurring.

The diagram at the bottom of the form should give as much detail as possible about fitting types, branch line lengths, and valve locations. This information is helpful for repair and maintenance.

The hydrant-maintenance and hydrant-inspection report forms (Figures 5-2 and 5-3) are used during routine hydrant inspections in conjunction with the procedures described in Sec. 5.3, Sec. 5.4, and Sec. 5.5. The hydrant-maintenance-report form is used when hydrants are repaired during routine inspections. The hydrant-inspection-report form is used when the inspection crew makes only minor repairs. All major repairs are written on a work-order form and are performed by a repair crew.

The flow-test-report form and the hydrant-test form (Figures 5-4 and 5-5) are used in conjunction with the flow test procedure described in chapter 6. The flow-test-report form is used to record the results of a single flow test; the hydrant-test form is a historical record of one hydrant. The historical record is extremely useful in determining distribution-system changes that affect fire flows.

FIRE HYDRANT MASTER RECORD

Manufacturer _____ Date _____ Hydrant No. _____

Type _____ MVO _____ Inlet _____

Bury _____ Hose Outlet-Nozzle Size _____ Thread Type _____

Pumper Outlet-Nozzle Size _____ Thread Type _____

Installed by _____ Date _____ W/O No. _____ Cost _____

Operating Nut _____ Turns to Open _____

Location _____ Line Static Pressure _____

Date	Inspected	Tested	Repaired	Painted	Opened by	Cost	Remarks

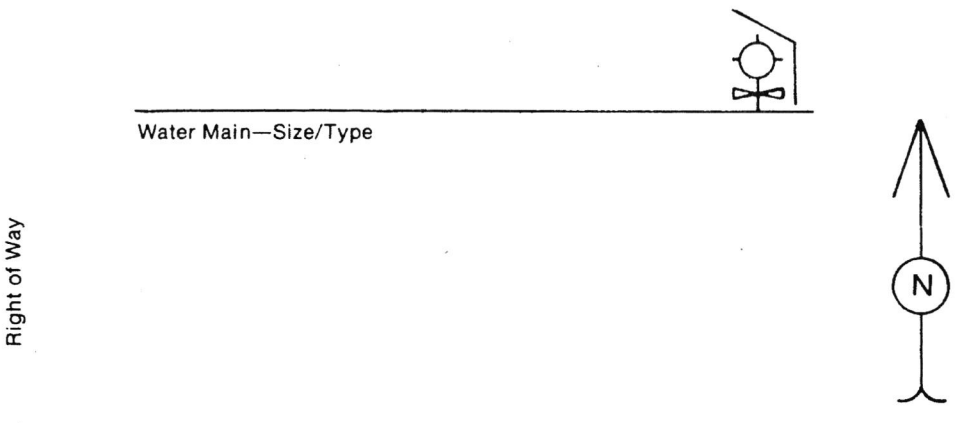


Figure 5-1 Master record.