

### MATERIAL SPECIFICATIONS

- A.** WATER MAIN SHALL BE AWWA C-151 DUCTILE IRON PIPE CLASS 52, SLIP-ON JOINTS WITH RUBBER GASKETS OR DR-18 CLASS 150, AWWA C-900 FOR 6" THROUGH 12" ONLY. DOMESTIC MADE ONLY.
- B.** BELL JOINT RESTRAINTS - FOR PVC, USE EBAA IRON SERIES 1500 OR FORD 1360. FOR DIP, USE EBBA 1100HD OR FORD/UNIFLANGE 1390.
- C.** MECHANICAL JOINT RESTRAINTS - FOR PVC PIPE USE ROMAGRIP, FORD/UNIFLANGE 1500 OR EBBA IRON 2000PV. FOR DIP PIPE USE ROMAGRIP, USE FORD/UNIFLANGE UFR 1400 OR EBBA IRON 1100.
- D.** FIRE HYDRANTS - MUELLER CENTURION, A-423, MECHANICAL JOINT, WITH (2) 2 1/2" HOSE NOZZLES, (1) 4 1/2" PUMPER NOZZLE NATIONAL STANDARDS THREADS CONFORMING TO AWWA, CCW TO OPEN, BREAK FLANGES 3" ABOVE GRADE.
- E.** GATE VALVES - AWWA TYPE C-509 OR C-515, RESILIENT WEDGE, NON-RISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN, WITH ARROW INDICATING OPEN DIRECTION. DOMESTIC MADE ONLY.
- F.** VALVE BOXES - 3-PIECE CAST IRON EAST JORDAN SERIES 8550 TOP SECTION, EAST JORDAN 8560 SERIES MID SECTION, EAST JORDAN #6 BASE, ADJUSTABLE SCREW TYPE WITH EAST JORDAN COVER MARKED "WATER", DOMESTIC MADE ONLY.
- G.** MECHANICAL JOINT COMPACT FITTINGS SHALL BE DUCTILE IRON CLASS 350 AND SHALL BE PRODUCED IN STRICT ACCORDANCE WITH ANSI/AWWA A2121.53/C-153 AND ANSI/AWWA A21.4/C-104 FOR CEMENT LINING IN SIZES 3" THRU 24". MECHANICAL JOINT NUTS AND BOLTS SHALL BE CORTEN OR DUCTILE IRON, HIGH STRENGTH, LOW ALLOY STEEL PER ANSI/AWWA A21.11/C-111, DOMESTIC MADE ONLY.
- H.** SERVICE LINE - TYPE COPPER TUBE SIZE (CTS) PLASTIC WITH COMPRESSION TYPE FITTINGS.
- I.** CURB STOP - FORD B44 STYLE MINNEAPOLIS STYLE.
- J.** CURB BOXES - EXTENSION MINNEAPOLIS STYLE AND CAST IRON LID WITH PENTAGON HEAD PLUG EM2-45-67.
- K.** SERVICE CONNECTIONS WILL NOT BE MADE WITHOUT THE INSTALLATION OF A METER.
- L.** ALL DUCTILE IRON PIPE, DUCTILE IRON FITTINGS AND BURIED BARREL OF FIRE HYDRANTS SHALL BE WRAPPED WITH 8mil POLYWRAP AS MANUFACTURED BY TRUMBALL INDUSTRIES.

### HYDROSTATIC TEST

- A.** AFTER THE PIPE HAS BEEN LAID AND BACKFILLED, ALL NEWLY LAID PIPE OR VALVED SECTION, SHALL BE SUBJECTED TO HYDROSTATIC PRESSURE AND LEAKAGE TEST. ALL WATER MAINS MUST BE HYDROSTATICALLY TESTED (AWWA C-600). THE TESTS MUST BE PERFORMED IN THE PRESENCE OF A REPRESENTATIVE OF THE VILLAGE OF ADA. THE LEAKAGE TEST PRESSURE SHALL BE NOT LESS THAN 150 PSI. THE DURATION OF THE LEAKAGE TEST SHALL NOT BE LESS THAN 2 HOURS. HYDROSTATIC PRESSURE SHALL BE APPLIED BY MEANS OF A PUMP TAKING WATER FROM AN AUXILIARY SUPPLY. ALL PIPING MUST BE PROPERLY FILLED AND FLUSHED TO DISPEL ALL AIR BEFORE THE TEST IS MADE USING POTABLE WATER.
- B.** LEAKAGE IS DEFINED AS THE QUANTITY OF WATER TO BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, NECESSARY TO MAINTAIN THE SPECIFIED LEAKAGE TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR EXPELLED.
- C.** NO PIPE INSTALLATION WILL BE ACCEPTED IF THE LEAKAGE EXCEEDS THE LEAKAGE DETERMINED BY THE FOLLOWING FORMULA:

$$L = \frac{D \cdot D \cdot \sqrt{P}}{7400}$$

WHERE: n = NUMBER OF PIPE JOINTS

D = PIPE DIAMETER

P = TEST PRESSURE

L = ALLOWABLE LEAKAGE PER HOUR

THE FOLLOWING TABLE REPRESENTS THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR.

- D.** DURING THE HYDROSTATIC TEST, A THOROUGH EXAMINATION OF ALL PIPING, FITTINGS, VALVES, HYDRANTS, ETC. SHALL BE PERFORMED. LEAKING JOINTS SHALL BE TIGHTENED AND CRACKED OR OTHERWISE DEFECTIVE MATERIAL SHALL BE REMOVED AND REPLACED AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

### ALLOWABLE LEAKAGE PER 1000 FT. (305M) OF PIPELINE (GPH+)

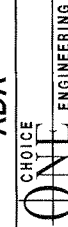
AVG. TEST PRESSURE (PSI) BAR	NOMINAL PIPE DIAMETER - INCHES															
	3	4	6	8	10	12	14	16	18	20	24	30				
450(31)	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78				
400(28)	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50				
350(24)	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21				
300(21)	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90				
275(19)	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73				
250(17)	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56				
225(16)	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38				
200(14)	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19				
175(12)	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98				
150(10)	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76				
120(9)	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52				

### DISINFECTION

- A.** AFTER SATISFACTORY HYDROSTATIC TESTING, THE COMPLETED WATER WORK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C-651.
- B.** MAINTAIN PIPES FREE OF DIRT AND FOREIGN MATTER DURING CONSTRUCTION BY DEWATERING TRENCH AND SEALING OPEN PIPE BARRELS. SWAB EACH LENGTH OF PIPE AS IT IS INSTALLED. UPON COMPLETION OF MAIN, ISOLATE MAIN SEGMENTS AND FLUSH PIPE AT 2 FPS VELOCITY.
- C.** STERILIZE MAIN IN ACCORDANCE WITH AWWA C-651. INJECT 3% TO 5% HYPOCHLORITE SOLUTION TO PROVIDE 50 TO 60 MG PER LITER CONCENTRATION IN MAIN. CHLORINE MAY BE PLACED IN EACH SECTION OF PIPE AT THE TIME OF INSTALLATION. SAMPLE WATER AT EACH HYDRANT OR IF NO HYDRANT IS AVAILABLE, AT A TAP IN THE PROPOSED LINE. ANALYZE SAMPLE USING ORTHOTOLIDINE REAGENT TO VERIFY FREE CHLORINE CONCENTRATION. MAINTAIN CONCENTRATION IN MAIN FOR 24 HOURS. SAMPLE HYDRANTS AT COMPLETION OF STERILIZATION VERIFYING MINIMUM CHLORINE RESIDUAL OF 20 MG PER LITER.
- D.** FLUSH CHLORINE SOLUTION TO WASTE INTO SANITARY SEWER AT A CONTROLLED RATE, NOT TO EXCEED 25 GPM. IF CHLORINE RESIDUAL DROPS IN 10 MG PER LITER, FLUSH MAIN AT 2 FPS AND REPEAT STERILIZATION PROCEDURE.
- E.** WATER SAMPLES - PERFORM BACTERIOLOGICAL TEST PER AWWA C-651. SAMPLE MAIN AT HYDRANT OR IF HYDRANT IS NOT AVAILABLE, AT A TAP IN THE PROPOSED LINE. DELIVER SAMPLE TO STATE CERTIFIED LABORATORY. DELIVER COPIES OF LABORATORY REPORT TO THE VILLAGE IN THE EVENT OF DETECTION OF COLIFORM ORGANISM. REPEAT FLUSHINGS, STERILIZATION, AND SAMPLING OF MAINS UNTIL ACCEPTABLE TEST RESULTS ARE ACHIEVED. THIS IS TO BE PERFORMED PRIOR TO TRANSFER OF SERVICE.

VILLAGE OF

ADA



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# WATER MAIN MATERIAL AND TESTING