

ORDINANCE NO. 15
AN ORDINANCE TO ESTABLISH:

A Manual of Practice for the Design of Public Improvements
in the Bloomington Township Public Water District

SECTION 15 - Design & Construction Standards for Water Distribution and
Supply System

- 15.02 General Requirements
- 15.03 Design Standards
- 15.04 Right-of-way and Easement Dedications
- 15.05 District's Participation in Cost
- 15.06 Specifications and Special Provisions
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15.02 GENERAL REQUIREMENTS

All developments shall be designed so the proposed water distribution and supply system accomplishes the following:

- A. Conforms with the Bloomington Township Public Water District's Water Master Plan.
- B. Extends water mains through the proposed development to serve otherwise unserved abutting properties.
- C. Provides adequate capacity to serve all the lots proposed to be served by the main, plus any additional extensions to the main which might be made to develop property in the same pressure zone with the type of uses and to the maximum density permitted by the County.
- D. Maintains separation from public or private sewer or septic systems.
- E. Loops water mains so as to avoid dead-ends.
- F. Private water supply systems, including but not limited to wells, holding tanks, and piping, which are no longer in active use shall be abandoned in accordance with all State and County regulations. The Owner of the property shall provide documentation to the District that the system has been properly abandoned.

15.03 DESIGN STANDARDS

- A. Provide a water service and an individual shut-off valve and box located in the public right-of-way between the sidewalk and the back of curb for each lot. In developments with private streets shutoff valve and box shall be located not more than 2 meters (6-1/2 ft.) from the back of curb or the water main, whichever greater.

The service line shall be extended inside the lot to a point not less than 0.6 meters (2 ft.) from the property line or easement line.

A water service connection of type "K" copper must be provided for each lot of record in subdivisions. Size and location of service connections in commercial, industrial and multifamily subdivisions is to be determined and installed

only if a specific use is known beforehand. Services shall be sized in accordance with Illinois State Plumbing Code.

- B. Water mains shall be designed so that looped water mains do not reconnect to the same source main unless there is no alternative whereupon the connections must be a minimum of 150 meters (500 ft.) apart or have a valve located between the two connections.
- C. Provide standard type fire hydrants at each intersection of two or more streets or roadways, and provide additional hydrants so that hydrants are spaced at intervals not exceeding; 2000 feet on long lines. The District has the right to require hydrants at more frequent intervals depending on the type of development. Hydrant spacing at 350 – 600 foot intervals may be required.
- D. Hydrants located at other than street intersections are to be positioned adjacent to the side-yard lot line of two adjoining properties so as to achieve the nearest approximation of hydrant spacing interval required for a specific zoning designation. .
- E. Hydrants are not to be located closer than 3 meters (10 feet) from any light standard, tree, sign-post, or other permanent structure that would impede access to the hydrant or reduce its visibility.
- F. For water mains 200 mm (8 inch) and smaller, In-line valves shall be installed at intervals not to exceed 370 meters (1200 feet). For water mains 300 mm (12 inch) and larger, in-line valves shall be installed at intervals not to exceed 460 meters (1500 ft.)
- G. Valves shall be placed at each branch connection and an in-line valve shall be located within 30 m (100 feet) upstream or downstream near each branch.
- H. Provide water mains having an inside diameter with a minimum of 200-mm (8 inches) nominal pipe size unless approval for smaller size is granted by the District Manager. All pipe shall be DUCTILE IRON Special Class 52, PVC SDR-21 or AWWA C-900.
- I. Water mains shall be located with a minimum clearance of 3.1 m (10 feet) horizontally, or 460 mm (18 inches) vertically

above when crossing, any public or private sanitary, storm sewer, drain or manhole in accordance with the Standard Specifications for Water and Sewer Construction in Illinois, latest edition.

- J. If a subdivision is constructed in phases creating temporary dead-end water main, a valve and fire hydrant must be installed at each temporary terminus.
- K. Whenever water mains must enter side yard easements, cross water courses, railroads or interstate highways, a valve shall be provided at both ends of the crossing so that the section can be isolated for testing or repair. Whenever water mains, 300 mm (12 inch) diameter or less, are lowered to pass under an obstacle and the depth of cover exceeds 2.4 m (8 feet), a valve shall be provided at each end of the lowered section.
- L. There shall be no connection or potentially possible connection between the Public Water Supply system and any pipes, pumps, hydrants or tanks from another system whereby unsafe water or other contaminating materials may be discharged or drawn into the Public Water Supply.
- M. No water main shall be constructed in backyard easements.

15.04 RIGHT-OF-WAY AND EASEMENT DEDICATIONS

All water mains which are to be publicly maintained shall be installed in public easements or dedicated public right-of-way. Water services to individual lots, which are to be privately maintained, shall not be located in easements across other lots, except for short distances to reach the public water main located in an easement immediately adjacent to the lot being served, or to reach the public water main located in a front yard easement on the opposite side of, and adjacent to, the street right-of-way from the lot being served. Such Easements and rights-of-way to shall be of sufficient width, and the water mains to be installed at such locations as to permit open cut installation, maintenance and repair within the confines of the easement or right-of-way without relocation or unreasonable interference with other public utilities located therein, and so as to meet the following minimum standards:

- A. Have a minimum width of 5 meters (15 feet), plus 1.5 meters (5 feet) for each additional utility.

- B. An additional 3 meters (10 feet) of width if a water main is to be installed parallel to a sanitary sewer, so that the two utilities will at least 3.1 meters (10 feet) of clearance.

15.05 DISTRICT'S PARTICIPATION IN COST

- A. Water Mains. The developer shall pay for the entire cost of water mains to serve land owned by the developer including up-sizing the water main to serve future growth in the vicinity of the development. If there is an existing water main adjacent to a proposed development, the developer shall pay a tap on charge to reimburse the District for his/her appropriate share of the cost of installing said water main. The District may choose to participate financially, at its sole discretion, if there are sufficient existing residents or businesses to make the extension economically feasible.
- B. Engineering Costs. The developer will be responsible for all engineering costs for coordination, design and construction observation of water main facilities within his/her development.
- C. District's Cost Participation. The District will internally allocate without charge to developer a reasonable amount of staff time as well as engineering and legal fees for any project. This allocation will cover review of plans, construction inspections and preparation and recording of the appropriate assignment, If extraordinary time, which is not caused by the District, is required, the District will surcharge the developer for additional staff, District engineer and District legal counsel expenses. This extraordinary time may result from, but is not limited to, failure to adhere to appropriate planning and construction standards and practices, difficulties with other governmental entities, multiple inspections, and failure of the developer to provide appropriate legal information and assistance for the assignment.

15.06 SPECIFICATIONS & SPECIAL PROVISIONS

All water mains shall use materials and be installed in such manner meeting or exceeding the required standards and specifications contained in the "Standard Specifications for Water and Sewer Main Construction", the then current edition as modified, supplemented and amended by this Manual or the District Manager. These modifications, amendments and amplifications have been provided in this Chapter of the Manual.

Tapping valves shall be Clow F-5093 F6114 resilient wedge gate valves or approved equal. Retainer Glands shall be: McWane (Clow) F-1058 or approved equal, and shall be installed at the joint between the valve and the proposed water main.

Tapping Sleeves shall be stainless steel with stainless steel bolts as follows:

Taps onto existing 4", 6" and 8" mains:
Cascade CST-SL, Ford FAST or approved equal

Taps onto existing 10" or larger mains:
Cascade CST-EX or approved equal

Valve boxes shall be provided and installed. All valve boxes shall have not less than a 5-1/4 inch shaft. The extensions of the valve box and shaft necessary to reach the ground elevation shall be included. Valve boxes shall be Tyler Pipe two piece, screw type, #6850 series with the word "water" cast on lid or an approved equal. A valve box stabilizer, painted blue, shall be furnished and installed on all valves (Adapter, Inc. or equal).

Water Service Markings: The contractor shall place 50 mm x 100 mm wood studs (2x4's) extending from the bottom of the water service to 0.6 m (2 feet) above the ground at the location of the end of each service. A minimum of the upper one (1) foot of each wood stud (2x4) shall be painted blue. These markers shall be installed at the time the services are constructed.

Curb Marking of Water Services: At the time the curb and gutter is poured, the contractor shall mark the top of the curb with a permanent "W" for water to mark location of the curb box.

Special Provisions Modifying Standard Specifications for Water and Sewer Main Construction in Illinois

DIVISION IV - WATER DISTRIBUTION

Applicable sections of this Division also apply to Force Main Construction.

40-2 PIPE MATERIALS

Force mains and water mains shall be:

1. Ductile iron pipe Special Class 52 with single gasket joints, AWWA C-150/AWWA C-151 with AWWA C-104 cement mortar lining, AWWA C-111

- joints, AWWA C-104 polyethylene encasement, and AWWA C-110 or C-153 ductile iron fittings.
2. Polyvinyl chloride (PVC) SDR-21, AWWA D-2241, NSF 14, AWWA C-110 or C-153 ductile iron fittings and ASTM F-477 elastomeric gaskets.
 3. AWWA C-900 Restrained Joint, Class 200 pipe for directionally drilled applications, NSF 14, AWWA C-110 or C-153 ductile iron fittings and ASTM F-477 elastomeric gaskets.
 4. High Density Polyethylene Pipe (HDPE), ASTM F-714 in ductile iron pipe size, 200 psi working pressure, NSF 61, AWWA C-110 or C-153 ductile iron fittings and ASTM F-477 elastomeric gaskets.

40-2.04 JOINTING

Add the following:

Where restrained joints are specified, they shall meet one of the following:

- a. U.S. Pipe: TR Flex Joint
- b. American Ductile Iron Pipe: Lok-Ring Joint
- c. McWane Inc. (Clow): Titon or Fastite Joint
- d. Griffin Pipe: Snap-Lok or Bolt-Lok
- e. 14" or larger pipe: Ebba Iron Sales Meg-a-lug Retainer Glands
- f. 12" or smaller pipe standard retainer glands from approved

manufacturers.

- g. or approved equal.

40-2.05 PIPE FITTINGS

Water main fittings incorporated into this work shall conform to A.N.S.I./A.W.W.A. C110/A21.10 and A.N.S.I./A.W.W.A. C111/A21.11, 1725 Kpa (250 psi) rated pressure. All fittings shall have the same linings and coatings as the pipe supplied. All fittings (including but not limited to bends, tees, reducers and plugs) shall be restrained with retainer glands or a manufactured joint restraining system approved by the District Manager.

40-2.06C STOPS AND FITTINGS

Add the following to this section:

Corporation Stops, Curb Stops and Curb Boxes shall be as follows or approved equals:

<u>Service Size</u>	<u>Corp. Stop</u>	<u>Curb Stop</u>	<u>Curb Box</u>
19mm-25mm (3/4"-1")	Mueller B-25008 Ford Type FB1000	Mueller B-25209, Ford 44-444 or A.Y. McDonald 4713 4T13	Mueller H-10314, Ford EA1-50-40 or A.Y. McDonald 5601

30mm (1-1/4"	Mueller H-15000	Mueller B-25209, Ford 44-444, or A.Y. McDonald 6100	A.Y. McDonald 5603
35mm-50mm (1-1/2"-2")	Ford, Mueller, or A.Y. McDonald Ball Valve	Ford, Mueller or A.Y. McDonald Ball Valve	A.Y. McDonald 5603

41-2.02A DEPTH OF PIPE COVER

Minimum depth of cover shall be 1.2 m (4 feet) unless approved by District Manager.

41-2.04 LAYING OF PIPE ON CURVES (DEFLECTION)

Delete the third paragraph of Section 21-2.04 and read: "The maximum deflection at any joint, shall not exceed 3 degrees per joint or 80%, of the pipe manufacturers recommended maximum, whichever is less." The contractor shall, at the time of contract execution, supply documentation from the pipe manufacture's to verify the recommended deflection for any type pipe proposed for use.

41-2.13A PRESSURE TESTING OF WATER MAINS

Testing per Section 41-2.13 shall be done by the contractor. The District shall have a representative present during testing.

Revise Section 41-2.13A to read:

After all pipe has been laid and back filled as specified herein, all newly laid pipe or any sections of it shall, unless otherwise expressly specified, be subjected to a hydrostatic pressure equal to fifty (50) percent more than the operating pressure at the lowest elevation of the pipe section or 120 psi whichever is greater, but not to exceed the pressure rating of the type of pipe specified. The duration of each pressure test shall be for a period of not less than two (2) hours and not more than six (6) hours. The basic provisions of A.W.W.A. C-600 and C-603 shall be applicable.

41-2.14 DISINFECTION OF WATER MAINS

Sterilization per Section 41-2.14 shall be performed by the contractor. The contractor shall notify the District Manager 24 hours prior to disinfection operations.

SECTIONS 42, 43 AND 44: VALVES AND BOXES

Revise the Sections 42, 43 and 44 to reflect that all valves and boxes must be approved by the District Manager before installation. Valves 300 mm (12 inch) diameter or less shall be Resilient Wedge Gate Valves meeting A.W.W.A. C509, such as Clow F-6100, Mueller, Waterous Series 500, or approved equal. Valves 350 mm (16 inch) or larger shall be butterfly valves meeting A.W.W.A. C504, Class 150-B, as manufactured by Mueller, Clow, Pratt or American. All valves shall be restrained with retainer glands or a manufactured pipe restraint system approved by the District Manager. All valve boxes shall have not less than a 130 mm (5 ¼" shaft). The extensions of the valve box and shaft necessary to reach the ground elevation shall be provided. Valve boxes shall be Tyler Pipe two piece, screw type, #6850 series with the work "water" cast on lid, painted blue, or an approved equal. Furnish a valve box stabilizer with each valve box.

Where valve boxes to be adjusted require more than one additional section of box, the top section of the box shall be removed and a section of 150 mm (6 inch) diameter A.W.W.A. C900 P.V.C. pipe, cut to length, shall be inserted into the bottom section of buffalo box and the upper section installed on top of the P.V.C. extension. All extensions of the valve box shall be installed plum and straight.

45 (FIRE) HYDRANT DETAILS

Revise all conflicting portions of Section 45 to reflect the following:

The specific type of hydrants used must be approved by the District Manager prior to installation. Hydrants shall be set as shown on the plans. Only standard hydrants are allowed, having a 6-inch inlet and two 2 ½" diameter hose nozzles with "Bloomington" threads. All bolts below ground level shall be stainless steel.

In Section 45-3 (13), hydrant blocking shall consist of masonry blocks and no poured-in-place concrete shall be used.

In Section 45-3 (16), change "0.25 cubic meter" (1/3 cubic yard) to read "0.50 cubic meter (2/3 cubic yard)." Landscape fabric or polyethylene (8 mils thick) shall be placed atop the rock/ stone prior to backfilling.

Hydrants approved for use:

Clow # 2500

Mueller Super Centurion Model A-422

Waterous Pacer WB-77

RECURRING SPECIAL PROVISIONS FOR WATER MAIN IMPROVEMENTS

Coordination of Work

The Contractor shall coordinate his operations with the District Manager. The chlorination, pressure testing and sampling of the new mains shall be done with the District Manager's supervision.

Laying Operations

The Contractor's attention is directed to the fact that he/ she must not allow any foreign material to enter the main such as tools, clothing, dirt, etc., while the main is being constructed. At times when pipelaying is not in progress, the open end of the pie shall be closed by watertight plug. All trenches must be pumped dry preceding any pipelaying operations.

Tracer Cable

Furnish and install a direct bury # 12 THWN single strand electrical cable with all water mains. Cable is to be laid alongside the water main during installation and prior to backfilling. The Cable shall extend continuously up through all valve boxes to a point 2-feet minimum above finish grade. No field splices are permitted except above ground at valve boxes or in test stations.

Water & Sewer Crossing

In cases where a water main crosses a storm sewer or sanitary sewer and proper separation cannot be provided, the Contractor shall construct the sewer as outlined in Division IV, Section 41-2.01C of the "Standard Specifications for Water and Sewer Main Construction", Latest Edition. Should the Contractor elect to encase the water main in lieu of constructing the sewer of water main quality pipe, the water main may be encased with any approved water main quality pipe. Water main 300 mm (12 inch) or greater in diameter that is encased shall be installed with approved casing spacers and the ends of the casing sealed. Before starting either of the above operations, the Contractor shall notify the District Manager and have the method approved.

Setting Hydrants

Each hydrant shall stand plumb and shall rest on a precast solid concrete block base. Under and around the drip of each hydrant shall be placed not less than 0.50 cubic meter one-half (2/3 cubic yard) of broken stone not less than 25 mm (1 inch) in size. Landscape fabric or polyethylene (8 mils thick) shall be placed atop the rock/ stone prior to backfilling. All fittings and valves in connection with the fire hydrant shall be the anchoring type. No hydrant shall be placed closer

than 0.75 m (2-1/2 feet) from back of curb or edge of pavement to the centerline of hydrant.

Connections to Existing Mains

If the connection to an existing water main requires a shutdown of the existing main, the Contractor shall notify all users of the affected main a minimum of 48 hours ahead of the shutdown. The Contractor shall re-chlorinate that portion of the existing water main which is shutdown before it is put back into service. The Contractor shall provide the necessary blocking or restraining of the existing main when he/she makes the new connection.

Leakage Test

When performing a hydrostatic pressure test, all water used must be potable and contain a chlorine residual of not less than 0.2 parts per million of free chlorine or 0.5 parts per million of combined chlorine. The hydrostatic pressure test will be made in accordance with ANSI/AWWA C-600 latest edition. The hydrostatic pressure shall be 120 psi or 150% of normal operating pressure whichever is greater for at least one two-hour duration and not vary more than 35 KPa (5 psi). Before applying the specified test pressure, the air shall be expelled from the pipe. The allowable leakage shall be determined by the following formula:

English Formula:

Metric Formula:

$$L = \left(\frac{SD\sqrt{P}}{133,200} \right)$$

$$L_m = \left(\frac{SD\sqrt{P}}{715,317} \right)$$

L = allowable leakage in gallons/hour
S = length of pipe in feet
D = nominal diameter of pipe in inches
mm
P = avg. test pressure during leakage
leakage,
test, in pounds per square inch
(gauge)

L= allowable leakage in liters/hour
S= length of pipe in meters
D= nominal diameter of pipe in
mm
P= avg. test pressure during
test in KPa

All visible leaks are to be repaired regardless of the amount of leakage. .

Flushing of New Mains

All water mains shall be flushed in accordance with Article 41-2.14 of the "Standard Specifications for Water and Sewer Main Construction". Water for flushing will be provided by the District at 50% of the current rate to District customers in the area upstream of the proposed extension. Measurement will be

made based on estimated flushing rates through hydrants. The Contractor shall provide and install any hose necessary to direct the water being flushed away from any area it might damage. The contractor shall take whatever precautions necessary during flushing to prevent ecological damage to any receiving stream, lake, or other body of water.

Water for Jetting Trenches

Jetting of trenches is generally not permitted. If special permission is sought from the District Manager, measurement will be made based on estimated rates through hydrants. The meter, fittings, connections, etc. shall be furnished and installed by the contractor and approved by the District Manager. If Jetting is permitted, it shall be allowed only at times designated by the District Manager. Water used for jetting will be billed at 50% of the current customer rate if the project is sanctioned by the District and billed at 100% in all other cases.

Water for Fire Protection Purposes

Recognizing that the District is billed for all water used in its system by the City of Bloomington, when a Property Owner experiences a fire and District water is utilized for fire suppression purposes, the Property Owner will be billed at the District's cost for water used in excess of 10,000 gallons.

Sampling and Chlorinating Taps

At the extreme ends of the proposed new water main or at locations as directed by the District Manager, sampling and chlorinating taps shall be installed by the Contractor in accordance with the details as shown on the plans and in accordance with Illinois Environmental Protection Agency requirements. After the chlorinating, sampling and testing is approved by the District Manager, the corporation stop shall be shut off and the piping removed from the corporation stop.

Disinfection of Mains

Disinfection must be accomplished by either the continuous feed method or slug method. The tablet method is not acceptable and is not to be used except with the expressed written permission of the District Manager. A chlorine residual of at least 50 parts per million must be attained initially and 25 parts per million residual present after 24 hours when the preferred continuous feed method is used. If the slug method is used, 300 parts per million must be retained for a minimum of 3 hours, or 500 parts per million retained for 30 minutes. Attainment of initial and final chlorine residuals must be verified by the District Manager. Disinfecting chlorine doses shall not remain in the pipe for more than 24 hours.

Bacteriological Testing

After disinfection, bacteriological testing must be done to insure the public health of the main. All samples must be tested at an IEPA approved laboratory.

Water mains that fail the initial bacterial test shall be flushed again before additional sampling is commenced. If the second sample also fails the bacterial test, then disinfection shall be repeated and flushing prior to additional sampling shall be required. If the third sample fails the bacterial test, then the next step shall be determined by the District Manager.

Trench Backfill

Approved compacted granular material shall be required in all trenches extending 0.6 m (2 feet) either side of all sidewalks, driveways and street pavements.

Curb and Gutter Crossing

Contractor may remove and replace the curb and gutter at the street crossings or he may tunnel the curb and gutter at his option. All excavated material shall be disposed of off site and the trench backfilled with approved compacted granular material.

Pavement Removal and Replacement

All Street Pavement Removal and Replacement shall be done in accordance with the Standard Specifications for Water and Sewer Construction.

Damage to Existing Structures

If damage is done to existing or new structures during construction of the proposed improvement, they shall be replaced or repaired in a satisfactory manner by the Contractor at his own expense.

Utilities

The Owner or his designee shall notify the utility companies of the impending project and the plans shall indicate the general location of the utility main lines. The Contractor shall have the responsibility before any construction work has begun, of obtaining from all utilities the exact location of any underground facilities in the area of construction, whether indicated on the plans or not. Any facilities disturbed by the Contractor shall be restored by him at his own expense. The Contractor shall coordinate with the proper utility the relocation of any facility designated on the plans or deemed necessary to be relocated by the District Manager in order to complete construction of the project.

The Contractor shall be held responsible for all damage done to utilities by reason or as a consequence of his/ her construction operations, including settlement after backfilling operations. All repairs shall be made at the Contractor's expense.

Residents shall be notified a minimum of 48 hours in advance of impending service outages, and no residence shall be without service overnight.

15.07 ORDINANCE IN FORCE

Sec. 1 This Ordinance shall be in full force and effect from and after its passage and approval and publication as provided by law.

Sec. 2 Passed and adopted by the Board of Trustees of the B.T.P.W.D. of McLean County, State of Illinois on the 13th day of June, 2006 by the following vote:

Ayes _____ namely _____

Nays _____ namely _____

Approved this _____ day of _____

Signed _____
(Chairman)

ATTEST:

Signed _____
(Secretary)

(WATER DISTRICT SEAL)

15.08 STANDARD DETAILS

<u>Standard Drawing No.</u>	<u>Title</u>
A	Hydrant Installation
B	Parallel Mount Hydrant Installation - Bloomington
C	(reserved)
D	Typical Water Service – Bloomington
E	Sampling & Chlorination Service Piping Tap - Bloomington
F	Creek Crossing Detail - Bloomington
G	(reserved)
H	Water & Sewer Separation Requirements/Horizontal
I	Water & Sewer Separation Requirements/Vertical
J	Water & Sewer Separation Requirements/Vertical (continued)
K	Pipe Cover Details - Bloomington
L	(reserved)
M	Concrete Encasement Plan - Bloomington
N	Typical Hydrant Location Plan - Bloomington