BENNER TOWNSHIP WATER AUTHORITY

MATERIAL & INSTALLATION SPECIFICATIONS
FOR

"PRIVATE"

DISTRIBUTION LINES,SERVICE LINES &FIRE HYDRANTS

Adopted 2/19/08

PRIVATE DISTRIBUTION LINE, SERVICE LINE
& FIRE HYDRANT SPECIFICATIONS

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General

Starting in (month, year), the Benner Township Water Authority will begin inspecting the installation and repair of "PRIVATE" distribution lines, service lines, fire lines and hydrants. The Water Authority will also specify and approve distribution, service and fire line materials. These inspections were previously performed by Centre Region Code personnel, who will continue to inspect the installation of and materials used for interior plumbing.

These specifications for "PRIVATE" distribution lines, service lines, fire lines and hydrant materials and installation are provided to guide engineers and developers during the design and installation stages of their projects. It is our hope that these specifications will lead to uniform use of materials and methods of installation. These pages provide guidelines for the Authority in performing inspections in a fair and proper manner.

Hours of Operation

Inspections 8:30 a.m. -4:00 p.m. Pressure Testing (starting time) 8:30 a.m. - 12:30 p.m.

Fee Schedule

Repairs - No Charge

Replacement - $35.00 per service line

New Service(s) - $35.00 per service line

Distribution Line(s) - $100.00 minimum, $1.00 per foot if over 100 feet

Violation(s) - $50.00 each

DEFINITIONS

Distribution Line - A water line originating from an Authority water main, which distributes water throughout the entire project but is not directly connected to a building(s) within the project. Generally, smaller service lines for buildings will be supplied from the "PRIVATE" Distribution Line.

Water Service Line -A water line which connects to an Authority water main or a "PRIVATE" Distribution Line and provides water service directly to a building(s). Generally, these lines are three-quarter (3/4") inch to two (2") inches in diameter.

Fire Line -A water line which connects to an Authority water main or a "PRIVATE" Distribution Line and provides fire service only to a building(s). Generally, these lines are two (2") inches in diameter or larger.

Restrained Joint -A joint between two sections of water line which, due to the use of a special gasket or mechanical joint fitting, is unable to be separated.

Depth -The amount of backfill placed over the top of a water line to return a trench to finished grade. The Authority requires no less than four (4') feet or no more than seven (7') feet.

Bedding -The envelope of material placed under, around and over the waterline. Generally, bedding consists of a minimum of six (6") inches of select material under the line, along both sides of the line and six (6") inches over the pipe unless otherwise specified.

Backfill -The trench material placed above the bedding and over a water line to return a trench to finished grade.

Violation -Any time a water line fails inspection by the Authority personnel or a violation of the specifications listed. This also includes a water line that is not ready for inspection at the scheduled time or the Authority personnel are unable to sign off on the Building Permit.

Section 1

"PRIVATE" DISTRIBUTION LINES

MATERIAL

A. Ductile Iron Pipe

1. Ductile iron pipe shall be Class 52 (minimum) and must be manufactured in accordance with ANSI/AWWA C150 & C151 standards for ductile iron pipe, centrifugally cast.
2. Joints for ductile iron pipe shall be of a restrained joint type, such as Field-Lok Restrained Joint Gaskets or equal and are required at each joint and shall comply with ANSI/AWWA C111/A2.11 standards.
3. All ductile iron pipe shall be cement lined and coated inside and outside with a bituminous seal coat in accordance with ANSI/AWWA C104 standards. The thickness of the lining shall NOT be less than one-eighth (1/8") inch for four (4") inch thru twelve (12") inch diameter pipe and shall NOT be less then three-sixteenths (3/16") inches for fourteen (14") inch thru twenty-four (24") inch diameter pipe.

B. Plastic Pipe/Tubing -*applicable only after the installation of a meter pit/vault.*

1. Polyethylene (PE) plastic tubing is approved for lines two (2") inches or less in diameter and shall conform with ASTM Standard D 2737.
2. PVC Pressure Rated pipe (SDR-21) is approved for lines two (2") inches but less than four (4") inches in diameter and shall conform to ASTM Standard D 2241.
3. C900 - DR18 (Blue Brute) or equal is approved for lines four (4") inches or greater in diameter.
4. All lines four (4") inches or greater in diameter must have Restrained Joints thru the use of Ebaa Iron Sales, Inc., Series 1600 Bell Restraint Harness or approved equal.

C. Copper Tubing

1. Shall be Seamless Type "K" copper, soft temper, for underground service, conforming to ASTM B-88 and B-251 for lines two (2") inches and less in diameter.
2. For connections to existing copper to copper service lines use Ford Meter Co. coupling C44 or equal for flared or compression connections.
3. For connections of existing copper to iron service lines use Ford Meter Co. Coupling C45 or equal.

D. Fittings

1. Fittings four (4") thru sixteen (16) inches in diameter shall have a minimum rating of 350 psi and shall be Ductile Iron compact mechanical joint fittings, in accordance with ANSI/AWWA C153/A21.53-88 standards, with mechanical joints conforming to ANSI/AWWA C111 complete with bolts, nuts. All sleeves shall be of the Solid Sleeve Type with accessories.
2. All fittings are to have Ebaa Iron Sales, Inc., Mega-Lug Glands or equal manufactured to ASTM A536, 60-42-10 ductile iron standards.

3. All nuts/bolts shall be installed with the proper torque according to the manufactures' instructions.

E. Valves

1. Valves twelve (12") inches and less, shall be of the iron body, non-rising bronze stem, resilient seated wedge type equal to or exceeding the requirements of AWWA Specification C-509, with a working pressure of 250 psi. All valves shall open "LEFT", and have a two (2") inch square wrench nut for buried service. End connections shall be mechanical joint, conforming to ANSI/AWWA C111 with all necessary accessories. All interior and exterior metal surfaces shall be fully coated with 4 mils, two-part epoxy coating.
2. All valves are to have Mega-Lug Glands or equal manufactured to ASTM A536, 60-42-10 ductile iron standards.
3. All nuts/bolts shall be installed with the proper torque according to the manufactures' instructions.

F. Valve Boxes

1. Valve boxes shall be provided and installed for all buried valves. Valve boxes shall be cast iron, two piece, screw type, five and three-quarter (5-3/4") inch shaft, with locking cover for valves located within the pavement, regular lids are to be used in other areas, both types are to be marked "WATER". The lengths of the valve boxes shall be as required to meet the actual field conditions encountered. Valve boxes shall be hot bituminous coated, inside and outside, with a coal tar or asphaltic compound.

   The valve box shall be installed in a manner approved by the Authority.

G. Underground Marking Tape

Shall be of detectable construction to aid in locating as manufactured by Thor Enterprises, Sun Prairie, WI or equal. It shall be bright blue in color, continuously printed ribbon tape of not less than two (2") inches wide X four (4) mil thick for all service lines and six (6") inches wide for all lines six (6") inches or greater in diameter.

H. Fire Hydrants

1. Fire hydrants, auxiliary valves and valve box shall be in compliance with AWWA C-502. All valves and piping shall be designed for 200 psi working pressure.
2. Hydrant shall be "American Darling" fire hydrants, Model B-62-B, Traffic Model as manufactured by "American Darling Valve", a division of "American Cast Iron Pipe Company". National Standard threads are required on all nozzle connections.

Section 2

"PRIVATE" WATER SERVICE/FIRE LINES

MATERIAL

A. Connections

1. Corporation stops shall have inlet threads which conform to AWWA/CC taper thread and compression joint outlet. Corporation stops shall be Type F1000, by Ford Meter Co. or Type 300, by Mueller Co. or approved equal.
2. Curb stops shall have compression joints on both the inlet and outlet side. Curb stops shall be Type B44, by Ford Meter Co. or Type 300 by Mueller Co. or approved equal.
3. For all service connections larger than two (2") inches, gate valves are required. Valves twelve (12") inches and less, shall be of the iron body, non-rising bronze stem, resilient seated wedge type equal to or exceeding the requirements of AWWA Specification C-515, with a working pressure of 250 psi. All valves shall open "LEFT", and shall be provided with a two (2") square wrench nut for buried service.
4. All valves larger than two (2") inches are to have Ebaa Iron Sales, Inc., Mega-Lug Glands or equal manufactured to ASTM A536, 60-42-10 ductile iron standards.
5. End connections shall be mechanical joint, conforming to ANSI/AWWA C111 with all necessary accessories. Valves shall have a full opening flow way of equal diameter to the connecting pipe. Valve body, bonnet, stuffing box and disk castings shall be manufactured of ASTM A-126 Class B Gray Iron. All interior and exterior metal surfaces shall be fully coated with 4 mils, two-part epoxy coating.

B. Ductile Iron

1. Ductile iron pipe shall be Class 52 (minimum) and shall be manufactured in accordance with ANSI/AWWA C150 & C151 for ductile iron pipe, centrifugally cast.
2. Joints for ductile iron pipe shall be of a restrained joint type such as Field-Lok Restrained Joint Gaskets or equal and shall conform to the applicable provisions of AWWA C111.
3. All ductile iron pipe shall be cement lined and coated inside and outside with a bituminous seal coat in accordance with ANSI/AWWA C104. The thickness of the lining shall NOT be less than one-eighth (1/8") inch for four (4") thru twelve (12") inch diameter pipe and shall NOT be less that three-sixteenths (3/16") inch for fourteen (14") thru twenty-four (24") inch diameter pipe, and one-quarter (1/4") inch for larger pipe.

C. Fittings

Fittings four (4") thru sixteen (16) inches in diameter shall have a minimum rating of 350 psi and shall be Ductile Iron compact mechanical joint fittings, in accordance with ANSI/AWWA C153/A21.53-88 standards, with mechanical joints conforming to ANSI/AWWA C111 complete with bolts, nuts. All sleeves shall be of the Solid Sleeve Type with accessories and manufactured in the U.S.A.

1. All fittings are to have Ebaa Iron Sales, Inc., Mega-Lug Glands or equal manufactured to

ASTM A536, 60-42-10 ductile iron standards.

2. All nuts/bolts shall be installed with the proper torque according to the manufactures' instructions.

D. Valves

1. Valves twelve (12") inches and less, shall be of the iron body, non-rising bronze stem, resilient seated wedge type equal to or exceeding the requirements of AWWA Specification C-515, with a working pressure of 250 psi. All valves shall open "LEFT", and have a two (2") inch square wrench nut for buried service. End connections shall be mechanical joint, conforming to ANSI/AWWA C111 with all necessary accessories. All interior and exterior metal surfaces shall be fully coated with 4 mils, two-part epoxy coating.
2. All valves are to have Mega-Lug Glands or equal manufactured to ASTM A536, 60-42-10 ductile iron standards.
3. All nuts/bolts shall be installed with the proper torque according to the manufactures' instructions.

E. Plastic Pipe/Tubing -*applicable only after the installation of a meter pit/vault.*

1. Polyethylene (PE) plastic tubing is approved for lines two (2") inches or less in diameter and shall conform with ASTM Standard D 2737.
2. PVC Pressure Rated pipe (SDR-21) is approved for lines two (2") but less than four (4") inches in diameter and shall conform to ASTM Standard D 2241.
3. C900 - DR18 (Blue Brute) or equal is approved for lines four (4") inches or greater in diameter.
4. All lines four (4") inches or greater in diameter must have Restrained Joints, by using Ebaa Iron Sales, Inc., Series 1600 Bell Restraint Harness or approved equal.

F. Copper Tubing

1. Shall be Seamless Type "K" copper, soft temper, for underground service, conforming to ASTM B-88 and B-251 for lines two (2") inches and less in diameter.
2. For connections of existing copper to copper service lines use Ford Meter Co. coupling C44 or approved equal for flared or compression connections.
3. For connections of existing copper to iron service lines use Ford Meter Co. coupling C45 or approved equal.

G. Curb/Valve Boxes

1. Curb boxes for three-quarter (3/4") & one (1") inch diameter service connections shall be cast iron, two piece, screw type, two and one half (2 ½") inch shaft with cover marked "WATER". The length of the curb box shall be as required for the actual field conditions encountered. Curb boxes shall be hot bituminous coated, inside and outside with coal tar or asphalt compound. Curb boxes shall be Catalog No. 94-E by Bingham and Taylor, or equal.
2. For service connections of one and one-half (1-1/2") inches and larger, a valve box will be required. (See SECTION 1 - F)

H. Underground Marking Tape

Shall be of detectable construction to aid in locating as manufactured by Thor Enterprises, Sun Prairie, WI or equal. It shall be bright blue in color, continuously printed ribbon tape of not less than two (2") inches wide X four (4) mil thick for all service lines and six (6") inches wide for all lines six (6") inches or greater in diameter.

Section 3

INSTALLATION

All "PRIVATE" distribution lines and water service lines will be installed per Authority approval and inspection. The Authority project inspector is authorized to require changes during the installation of water mains, service connections, fire hydrants and their appurtenances if it is deemed to be in the best interest of the Authority.

A. "PRIVATE" Distribution Lines

1. Depth - Water lines must be installed to a minimum depth of four (4') feet and a maximum depth of seven (7') feet below finished grade.
2. Trenching - Trenches shall provide solid and continuous bearing for all pipe installed. Over excavation shall be backfilled to the proper grade with compacted earth, sand fine gravel or similar material. Piping may not be supported by rocks or blocks at any point. Rocky soil shall be over excavated to a depth equal to one (1) times the pipe diameter or six (6") inches whichever is greater and backfilled to the proper grade with compacted granular material.
3. Backfill/Bedding - No rocks, broken concrete, frozen chunks or other rubble can be deposited within the trench until the pipe is covered by at least twelve (12") inches of compacted approved bedding. Remaining trench depth can be backfilled with approved material in layers of eight (8") inches and compacted in place.
   a. Ductile Iron pipe - When acceptable to the Authority, native material may be used for bedding and/or backfill. Loose earth shall be placed and compacted in six (6") inch layers within the trench to a minimum depth of twelve (12") inches over the top of the pipe. When the trench conditions are unsuitable, select bedding and backfill materials may be required.
   b. PVC - Bedding shall be crushed aggregate, select granular material or sand, conforming to PennDot Publication 408, Section 703.1, 703.2 or 703.3 respectively. Bedding shall be placed twelve (12") above and six (6") inches below the water line.
   c. Copper - Bedding shall be clean topsoil, non-limestone select granular material or sand, conforming to PennDot Publication 408, Section 703.1,
   703.2 or 703.3 respectively. Bedding shall be placed twelve (12") above and six (6") inches below the water line.
   d. Where applicable, backfill must meet all local municipal and/or state requirements.
   e. Backfilling can not be completed until Authority personnel have inspected, tested and approved the installation including depth. All joints, fittings and fire hydrant connections must be visible to the inspector.
   f. Underground Marking Tape conforming to Section 1, Paragraph G of these specifications is to be placed a minimum of one (1') foot above the installed water line.
4. Utility Separation -A minimum of twelve (12") inches of vertical separation must be maintained between the water main and any sanitary/storm sewer crossing with each pipe being installed on a solid ledge. A minimum of five (5') feet horizontal separation must be maintained between the water main and sanitary/storm sewer if they are the same elevation. The horizontal separation between water lines and all other utilities is a minimum of five (5') feet unless otherwise approved by the Authority.
5. Blow-off-Assemblies - Shall be required on all dead end lines and shall be as follows:
   a. Six (6") inch and smaller mains - Two (2") inch curb stop and blow-off, with a two (2") inch BRASS NIPPLE between the two inch curb stop and cap/plug.

b. Eight (8") inch mains - Four (4") inch valve and blow-off.
c. Twelve (12") inch and larger mains - Six (6") inch valve and blow-off.

6. Trenchless Installation - Will be acceptable provided that it is done so no settlement above the pipeline or voids around and below the pipeline occur.
7. Pressure Testing -shall be in accordance with AWWA C600. Hours for beginning a pressure test are between 8:30 a.m. and 12:30 p.m.
8. Disinfection - shall be in accordance with AWWA C651-92.
9. Bacteriological Test - On all lines one and one-half (1 ½") inches and larger in diameter a bacteriological test must be performed. When the water in the treated main shall have been proven comparable to that of the source, the main will be charged with source water and allowed to stand for a period of twenty-four (24) hours. After this period a water sample will be collected for a bacteriological test. Bacteriological analysis will be run by a commercial or other laboratory approved by the Authority and paid by the owner/contractor. The Authority and Centre Region Code Enforcement offices will be provided a copy of the lab report prior to final inspections.

B. "PRIVATE" Water Service Lines and Fire Lines

1. Depth - All service connections must be installed to a minimum depth of four (4') feet and a maximum depth of seven (7') feet below finished grade.
2. Trenching - Trenches shall provide solid and continuous bearing for all pipe installed. Over excavation shall be backfilled to the proper grade with compacted earth, sand, fine gravel or similar material. Piping may not be supported by rocks or blocks at any point. Rocky soil shall be over excavated to a depth equal to one times the pipe diameter or six (6") inches whichever is greater and backfilled to the proper grade with compacted granular material.
   a. Trenching installed parallel to building footings shall not extend below the forty-five (45E) degree bearing plane of the bottom edge of a wall or footing. Piping installed deeper than and parallel to footings or bearing walls shall be located above the foot bearing plane. The footing bearing plane shall extend downward from the bottom of the footing at an angle of forty-five (45E) degrees from the horizontal.
3. Backfill/Bedding - All services requiring copper tubing shall be bedded with a minimum of six (6") inches on the bottom and sides, with twelve (12") inches on the top of clay or sand (no limestone sand permitted).
   a. Ductile Iron pipe - When acceptable to the Authority, native material may be used for bedding and/or backfill. When the trench conditions are unsuitable, select bedding and backfill materials may be required.
   b. PVC tubing - Bedding shall be crushed aggregate, select granular material or sand, conforming to PennDot Publication 408, Section 703.1, 703.2 or
   703.3 respectively. Bedding shall be placed twelve (12") above and six (6") inches below the water line.
   c. Copper - Bedding shall be clean topsoil, non-limestone select granular material or sand, conforming to PennDot Publication 408, Section 703.1,
   703.2 or 703.3 respectively. Bedding shall be placed twelve (12") above and six (6") inches below the water line.
   d. Prior to the backfilling of an service connection trench, Authority personnel must inspect the installation with the service line under operating pressure. All joints, fittings and valves must be visible to the inspector.
   e. All service connections requiring ductile iron pipe shall be bedded in conformance

with the specifications listed in Section 3, Paragraph A3 of these specifications.

f. Underground Marking Tape conforming to Section 1, Paragraph G of these specifications is to be placed a minimum of one (1') foot above the installed water line.

g. In all cases where an over dig has occurred, all backfill under service lines must be compacted to provide stable bedding for the service line.

4. Utility Separation -A minimum of twelve (12") inches of vertical separation must be maintained between the water main and any sanitary/storm sewer crossing with each pipe being installed on a solid ledge. A minimum of five (5') feet horizontal separation must be maintained between the water main and sanitary/storm sewer if at the same elevation. The horizontal separation between water lines and all other utilities is a minimum of five (5') feet.
5. Installation Under Concrete Slab - Inaccessible water service lines under slabs shall be Type K copper tubing, ductile iron pipe or polyethylene tubing with a minimum pressure rating of 120 psi and must be installed with approved fittings and/or bends. Copper and polyethylene tubing require the use of a sleeve for the entire length under slab. Said sleeve is to be filled with a pourable filler material after the insertion and testing of the tubing.
6. Trenchless Installation - Will be acceptable provided that it is done so no settlement above the pipeline or voids around and below the pipeline occur. There must also be no joints in copper service connections within the bored distance.
7. Existing Service Connections -It shall be the Contractors responsibility to physically verify the location and size of all service lines prior to starting excavation. It is also the Contractors responsibility to determine the location of all other utilities within the work area.
8. Pressure Testing - of service lines shall be in accordance with AWWA C600. Pressure Testing of fire lines requires a four (4) hour test at 210psi. Hours for beginning a pressure test are between 8:30 a.m. and 12:30 p.m.

C. Fire Hydrants

1. All fire hydrants shall be installed with a six (6") inch gate valve between the fire hydrant and the distribution line.
2. Fire hydrants of the proper length are to be installed to meet proposed grade.
3. In situations where an extension is necessary to meet proposed grade, only base extensions may be used after receiving Authority approval.

Section 4

STRUCTURAL AND PIPING PROTECTION

A. Breakage and Corrosion -Pipes passing through or under walls shall be protected from breakage. Pipes passing through concrete or cinder block walls or floors, cold-steel formed framing or other corrosive material shall be protected against external corrosion. This is to be accomplished through the use of protective sheathing, wrapping or other approved means to withstand any reaction from lime and acid of concrete, cinder or other corrosive material. Sheathing or wrapping shall allow for the expansion and contraction of piping to prevent any abrasive action and shall have a minimum thickness of twenty-five thousandths (0.025") inches.

B. Sleeves - Sleeves are to be two (2) times the pipe diameter. Annular spaces between sleeves and pipes shall be caulked with waterproof silicone or other approved material.

1. On commercial applications, link seals are required at the point the line(s) pass through the exterior wall.