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## **Bethel Township Municipal Authority (BTMA)**

# **RESIDENTIAL SEWER CONNECTION MANUAL**

### **CONSTRUCTION SPECIFICATIONS AND DETAILS FOR RESIDENTIAL BUILDING SEWER CONNECTIONS**

#### **A. General Specifications**

##### **1. Equipment and Materials**

- a. The use of equipment and materials other than those specified or beyond the scope of these specifications must be approved by Bethel Township Municipal Authority (BTMA) in writing. See Section C for details regarding the waiver process.
- b. All materials shall be new and pipe shall be legibly and permanently marked in ink with the following minimum information:
  - i. Manufacturer's name or trademark and production code
  - ii. Nominal size (for example, 4")
  - iii. The PVC Cell classification (for example, 12454)
  - iv. The legend "SDR-35 PVC Sewer Pipe" ASTM D 3034

##### **2. Delivery, Storage and Handling of Equipment and Materials**

- a. Contractor must transport and handle products in accordance with the manufacturer's instructions.
- b. Contractor must inspect products to ensure they comply with specified requirements and are not damaged.
- c. Contractor must provide equipment and personnel to handle and store products by methods to prevent soiling, disfigurement, or damage.
- d. Contractor must store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible.
- e. Contractor must protect products from vandalism, contamination by dirt, dust, or water, damage from heat or cold, and damage from direct sunlight.

**3. Minimum Pipe Size:**

- a. Service Line (resident): Four (4) - inch diameter.
- b. Lateral (Authority): Six (6) - inch diameter.
- c. In all cases, the Line must be of adequate size to carry projected sewer flows.

**4. Pipe Material: Polyvinyl Chloride (PVC)**

- a. **Pipe:** Type PVC SDR-35, ASTM D3034
- b. **Fittings:** Conforming to the same applicable ASTM Specification requirements for pipe.
- c. **Joints:** Push-on with elastomeric gasket, ASTM D3212, and ASTM F477 for gasket specifications.
- d. **Trap:** Solvent welded PVC Schedule 40 Pipe and Fittings OR PVC SDR-35 Pipe and Fittings. Trap must have a one (1) piece return.

**5. Existing Sewer Line Connection Point:** The connection to the existing sewer line shall be made in accordance with the following two (2) selected options:

- a. **Outside of Existing building:** Any connections to existing sewer lines outside of the existing building shall be made within two (2) feet of the outside building wall and will also require the use of a Fernco, Inc. 5000 Series Connector at the existing connection.
- b. **Inside of Existing building:** Any connections to existing sewer lines inside of the existing building shall NOT require the use of the Fernco, Inc. 5000 Series Connector but will allow for the use of an appropriate connection device.

**6. Service Line Check Valve:**

- a. Sewer service check valve shall be installed in a horizontal portion of the sewer service line and shall prevent the reverse flow of wastewater into the structure.
- b. The check valve shall be supplied in a kit from one manufacturer consisting of a valve body, disk, disk seat and upper collar. It shall comply with CSA B181-4, and the plastic materials shall conform to ASTM D1784, cell classification 12454-B and NSF 14.
- c. The check valve shall include an access sleeve that is a pipe opening through which access is gained to the disk or valve seat. The access sleeve shall be cut to length in the field and attached to the socket on the top of the valve body.

- d. A 6-inch PVC Female Adapter (solvent welded to 6-inch PVC access sleeve) and a removable (threaded) 6-inch PVC Cover Plug are required but are not included in the Kit provided by the Authority. Solvent welded Caps or Plugs to the access sleeve are not acceptable.
- e. The collar, insert pipe and disk assembly shall be designed to fit inside the access sleeve, the removable assembly shall consist of a length of insert pipe permanently attached to the access collar on the top and a disk assembly on the bottom. It is then removed vertically from the access sleeve, the attached disk assembly is also removed allowing above grade repair. The internal lifting device is self-aligning, self-seating and provided with an alignment indicator located with 12 inches of the upper access opening.
- f. The check valve shall be installed on horizontal sewer service lines with uniform slope. The access sleeve shall terminate above grade and shall have a maximum length of 12 feet.

## **B. Installation and Inspection**

### **1. GENERAL REQUIREMENTS (CONDUCT OF WORK):**

- a. A Sewer Connection Permit MUST be obtained from the Bethel Township Municipal Authority prior to any work being completed on the sanitary sewer connection. No work shall commence without this permit.
- b. Contractor must exercise caution at all times to protect persons and property in accordance with applicable laws and codes. Contractor is responsible for compliance with the safety provisions of applicable laws and building and construction codes.
- c. Contractor must take precaution and furnish and maintain all guards, barricades, handrails, lights, and other appurtenances, required by law for the protection of the traveling public and property at or near the property.
- d. Contractor is responsible to ensure that all equipment, tools, and supplies are operated or handled in such a manner that at no time will they be permitted to contact power, telephone, or other lines.
- e. Contractor is responsible for the repair of all damages to public or private property resulting from construction operations. Damaged property shall be restored to a condition equal to or better than that which existed prior to construction. If the damage is done to trees or shrubs, the Contractor shall replace with specimens of same type and size.
- f. Contractor is responsible for locating all existing underground structures and utilities including, but not limited to water, steam, oil, natural gas mains, sanitary and storm sewers, and telephone and electrical conduits, which may be encountered during construction operations.

- g. Contractor is responsible for providing adequate protection against damage to utilities encountered during the course of construction and shall repair, at this own expense, any utilities damaged during the course of construction.
- h. Contractor is responsible for contacting the Pennsylvania One call System Inc (811) in compliance with the Pennsylvania Utilities Act, Act 287 of 1974, as amended by Act 38 of 1991.

## 2. GENERAL REQUIREMENTS (DESIGN):

- a. Unless otherwise noted, all designs shall conform to acceptable engineering practice, shall meet the requirements of PA DEP and OSHA and shall conform to the requirements contained herein.
- b. The Service Line shall have:
  - i. Minimum Cover (at any point along entire length of service line): Three (3) feet typical.
  - ii. Minimum Slope (at any point along entire length): 1% (1/8" per foot) typical.

## 3. INSTALLATION (TRENCH EXCAVATION):

- a. **Width of Trench:** Pipe trenches shall be sufficiently true in alignment to permit the pipe to be laid in the approximate center of the trench. The trench shall be wide enough to provide a free working space on each side of the pipe, the trench width from the trench bottom to a point 12 inches above the top of the outside barrel of the pipe shall not exceed 24 inches (4" – 8" nominal pipe diameter).
- b. **Pipe Bedding:** The trench shall be excavated to a depth of six (6) inches below the outside diameter of the pipe barrel. The resultant subgrade shall be undisturbed or compacted. The bedding shall then be placed as specified below under "Backfilling Methods." Bedding shall provide uniform and continuous bearing and support for the pipe at every point between bell holes.
- c. **Unsuitable Subgrade:** Where the bottom of the trench at subgrade is found to be unstable, or to include ashes, cinders, any type of refuse, vegetable, or other organic material, or large pieces of fragments of inorganic material, such unsuitable material shall be removed to the width and depth recommended by the BTMA representative. Before the pipe is laid, the subgrade shall be adjusted by backfilling with aggregate material, thoroughly tamped, and the bedding prepared as specified.

**d. Backfilling Methods:**

- i. Pipe Bedding Beneath and to Centerline of Pipe (PennDOT No. 1B or AASHTO No. 8 Stone): All trenches shall be backfilled, from the bottom of the trench to the centerline of the pipe with bedding material (PennDOT No. 1B or AASHTO No. 8 Stone) and compacted by hand tamping to six (6) inches. Bedding material shall be deposited in the trench for its full width on each side of the pipe and fittings simultaneously.
  - ii. Initial Backfill Over Pipe (PennDOT No. 1B or AASHTO No. 8 Stone): From the centerline of the pipe and fittings to a depth of one (1) foot above the top of the pipe, the trench shall be backfilled by hand or by approved mechanical methods with PennDOT No. 1B or AASHTO No. 8 Stone. The Contractor shall use special care in placing this portion of the backfill so as to avoid injuring or moving the pipe. The backfill shall be compacted by hand tamping or other approved mechanical methods.
  - iii. Aggregate Backfill to Restoration Depth (Recommended for Paved, Gravel and areas subject to vehicular traffic): From one (1) foot above the top of the pipe to restoration depth, the trench shall be backfilled by hand or by approved mechanical methods. Consolidation methods using water, such as jetting or puddling, are not permitted. Consolidation shall proceed from the center of the trench to the sides to prevent arching.
  - iv. Excavated (suitable) Backfill Material to Restoration Depth (Recommended for Lawn and Unimproved Areas): From one (1) foot above the top of the pipe to the restoration depth, the trench shall be backfilled by hand or by approved mechanical methods. Consolidation methods using water, such as jetting or puddling, are not permitted. Consolidation shall proceed from the center of the trench to the sides to prevent arching.
- e. Compacting: Use mechanical tampers, to compact materials in trench backfill operations, to produce a density of backfill at the bottom of each layer of not less than 90 percent of maximum density obtained at optimum moisture content as determined by AASHTO T99.

**4. INSTALLATION (PIPE LAYING):**

- a. Metal Marking Tape shall be placed 12-inches above the pipe for the entire horizontal run.

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- b. **General:** All pipes shall be laid to uniform line and grade, bell ends upgrade, with a firm and even bearing along the barrel of the pipe, close joints and smooth invert. The spigot end of the pipe shall be centered in, shoved tight and secured against the bell of the previously laid pipe. The interior of each pipe shall be cleaned of all excess joint and foreign material before the next pipe is laid. The pipe shall be laid in the backfill materials as specified. Pipe-laying shall commence at the lowest point and proceed upgrade. At the close of each day's work and at such other times when pipe is not being laid, the open end of the pipe shall be protected with a close fitting stopper.
  - c. **Pipe Clearance in Rocks:** Ledge rock, boulders, and large stones shall be removed to provide a clearance of at least six (6) inches below and on each side of all pipe and fittings for pipes 24 inches in diameter or less. This specified minimum clearance is the minimum clear distance which will be permitted between any part of the pipe or fitting being laid and any part, projection, or point of such rock, boulder, or stone.
  - d. **Existing Sewer Line Connection Point:** The connection to the existing sewer line shall be made in accordance with the following two (2) selected options:
    - i. **Outside of Existing building:** Any connections to existing sewer lines outside of the existing building shall be made within two (2) feet of the outside building wall and will also require the use of a Fernco, Inc. 5000 Series Connector at the existing connection.
    - ii. **Inside of Existing building:** Any connections to existing sewer lines inside of the existing building shall NOT require the use of the Fernco, Inc. 5000 Series Connector but will allow for the use of an appropriate connection device.
5. **INSPECTION:** The Sewer Service Line (outside line) must be inspected by an authorized BTMA representative before covering any trench or connecting the Service Line to the Lateral Line (which is already connected to the Sewer Main Line). The Contractor must give the BTMA representative at least 24 hour notice for a final inspection.
- a. Each building sewer is required to be tested before the trench is backfilled. The test will require placement of an inflated test ball at both the transition "T" to the existing sewage discharge and the test "T" at the transition to the Service Lateral, as well as the cleanout fittings. One of the test balls shall be equipped with air pressure gauge, calibrated to 0.1 lbs/sq. in. and standard air hose connection to pressurize the Building Sewer, and an air release valve.

- b. It may be required to place stone bedding over the pipe at several locations (pipe joints), to avoid separation during the test. Air pressure shall be slowly introduced until there is a uniform gauge pressure of 5.0 psi. A minimum of two (2) minutes must be allowed for equilibrium of the air temperature with the pipe wall. If no loss of pressure is observed, allow test to continue for six (6) minutes. The service line shall be deemed acceptable if this pressure is maintained for six minutes without a drop in pressure of more than 0.5 psi. For service lines in excess of 400 feet in length and/or greater than six feet in depth, the Authority shall set the test pressure in accordance with site conditions.
6. **RESTORATION AND CLEANUP:** The contractor completing the work shall be responsible for restoration and cleanup following completion of the Building Sewer Connection work, including State Highways, Township streets, alleys and right-of-ways, yards, driveways and all other disturbed areas.
  7. **OTHER PERMITS & INSPECTIONS:** Nothing in these regulations is intended to preclude, forego or supersede permits and inspections as may be required by other agencies should the proposed work require such other permits and inspections. It is the responsibility of the contractor to secure any other necessary permits and inspections as appropriate to the work being completed.
  8. **INSURANCE:** It is the responsibility of the contractor completing the work to ensure his insurance coverage is adequate and appropriate in type and amount for the type of work being completed. Any damage claims as a result of the work completed will be the responsibility of the contractor.

### C. Waiver Requests

The use of equipment, materials and construction methods other than those specified or beyond the scope of these specifications must be approved by Bethel Township Municipal Authority (BTMA) in writing. Waiver requests shall be made in writing and forwarded to the BTMA for consideration prior to any construction is begun on any site seeking waiver approval.

### APPENDICES ATTACHED

Appendix A – Acceptable Manufacturers List  
Appendix B – Standard Details

## **APPENDIX A**

### **Acceptable Manufacturers List**

1. Gasketed Joint PVC SDR 35 Pipe:
  - a. Push-on Joint Pipe
    - i. Diamond Plastics Corporation
    - ii. Johns Mansfield (J-M Pipe) Company
    - iii. National Pipe and Plastics, Inc.
    - iv. Approved Equal
2. Gasketed Sewer Pipe Fittings
  - a. GPK Products, Inc.
  - b. Harco
  - c. Approved Equal
3. Flexible Pipe Couplings
  - a. Fernco, Inc. 5000 Series Connector
  - b. Approved Equal
4. Service Line Check Valve
  - a. Clean Check, Inc. (Rectorseal)
  - b. Approved Equal
5. Protective Sleeve for Cleanout (Frame and Cover)
  - a. East Jordan Iron Works
  - b. Neenah Foundry Company
  - c. Approved Equal
6. Other Materials shall be Reviewed by Authority prior to installation

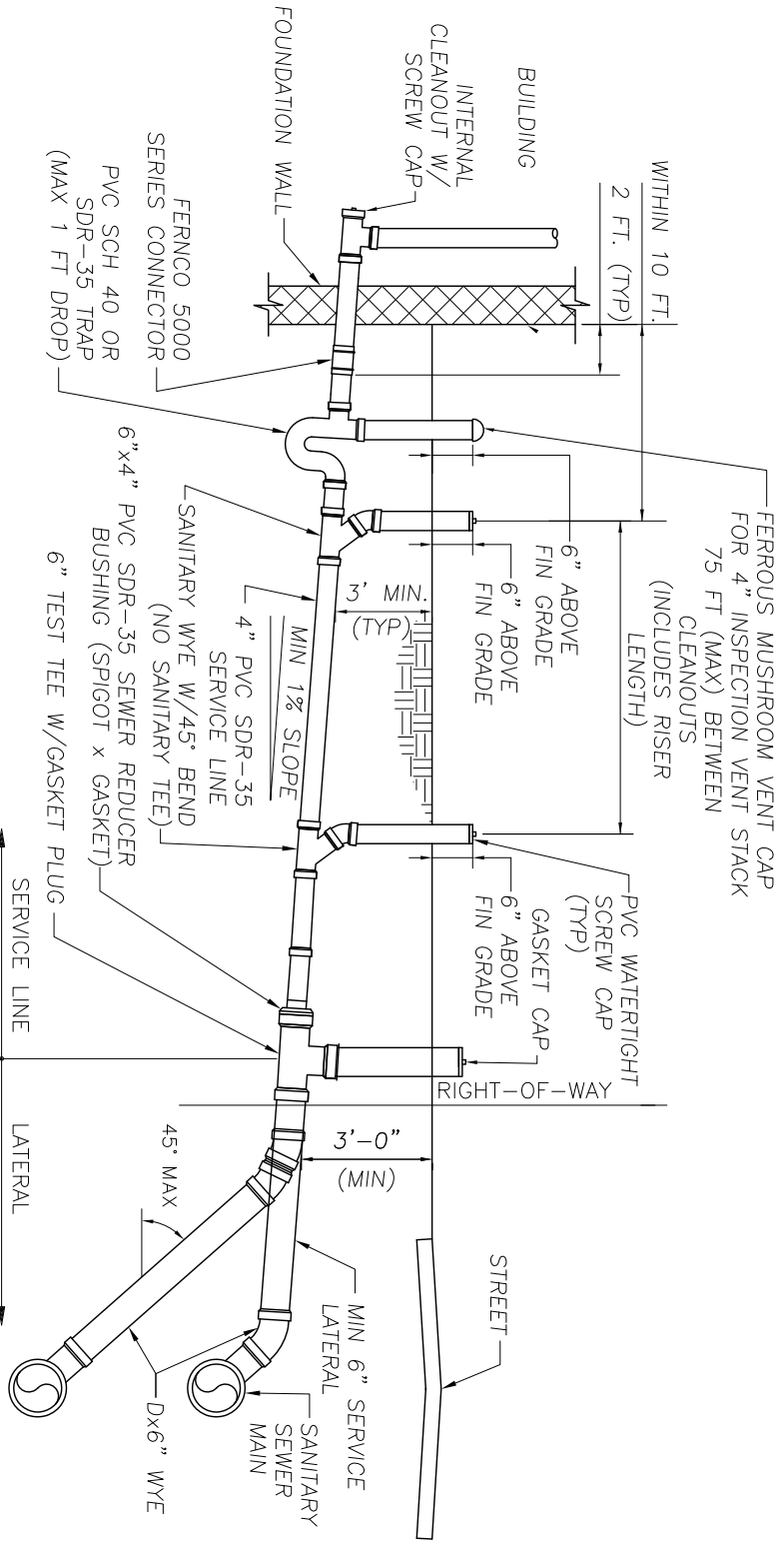
## **APPENDIX B**



### **Standard Details**

#### **INDEX OF STANDARD DETAILS (ATTACHED)**

- 1 (# 21) - Typical Building Sewer Connection Detail
- 2 (# 23) - Sewer Cleanout in Paved Areas Detail (Protective Sleeve)



- NOTES:**
1. CLEANOUT RECOMMENDED OUTSIDE FOUNDATION WALL WHEN CLEANOUT NOT PROVIDED INSIDE THE HOUSE.
  2. PROVIDE 6" OF AASHTO NO. 8 (OR PennDOT NO. 1B) STONE BELOW PIPE AND 12" ABOVE ENTIRE LENGTH OF PIPE
  3. SEWER SERVICE CHECK VALVE SHALL BE INSTALLED IN A HORIZONTAL PORTION OF THE SEWER SERVICE LINE AND SHALL PREVENT THE REVERSE FLOW OF WASTEWATER INTO THE STRUCTURE.
  4. CLEANOUTS RECOMMENDED IN CHANGES OF DIRECTION AND MAXIMUM HORIZONTAL BEND RECOMMENDED IS 45 DEGREES.
  5. PROTECTIVE SLEEVES (COVERS) ARE REQUIRED:
    - a. FOR CLEANOUTS SUBJECT TO VEHICULAR TRAFFIC.
    - b. FOR CLEANOUTS IN PAVED OR GRAVEL AREAS.
    - c. WHEN CLEANOUTS ARE PLACED FLUSH WITH THE GROUND SURFACE
  6. FERNCO 5000 SERIES CONNECTOR SHALL BE REQUIRED ON EXISTING OUTSIDE BUILDING CONNECTIONS ONLY AND NOT NECESSARY WHEN EXISTING SEWER LINE IS REPLACED THROUGH BUILDING LINE.

**TYPICAL RESIDENTIAL BUILDING SEWER CONNECTION DETAIL**

NO SCALE

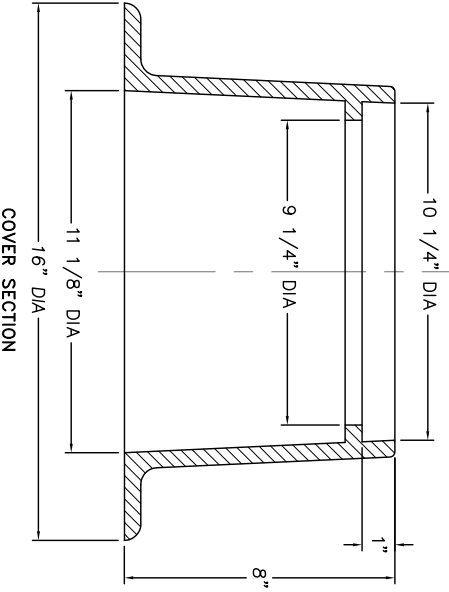
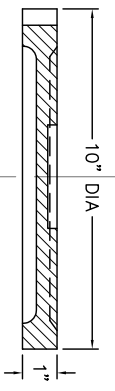
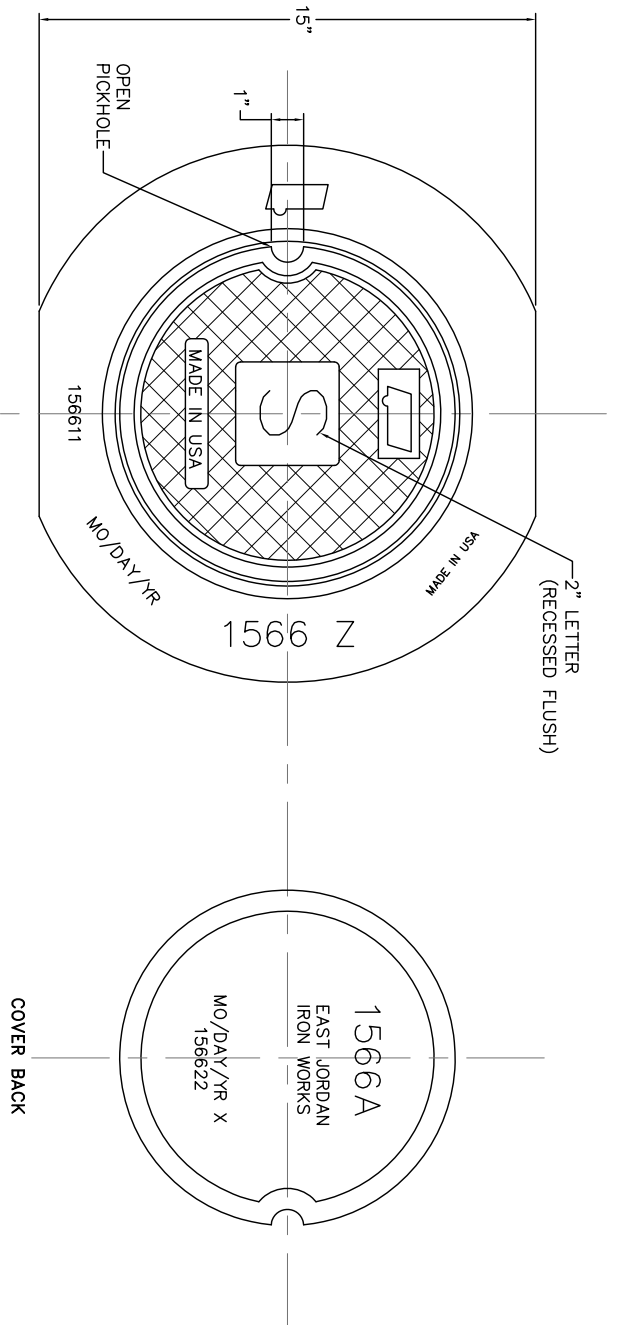


**BETHEL TOWNSHIP  
MUNICIPAL AUTHORITY**

STANDARD DETAIL - SEWER SYSTEM

Date: SEPTEMBER 2009


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NOTE:  
 1. EAST JORDAN IRON WORKS IS AN ACCEPTABLE MANUFACTURER AND AN AUTHORITY APPROVED EQUAL WILL BE ACCEPTED.

**SEWER CLEANOUT COVER IN A PAVED AREA**

NOT TO SCALE

<b>23</b>	<b>BETHEL TOWNSHIP MUNICIPAL AUTHORITY</b>	
	STANDARD DETAIL - SEWER SYSTEM	
	Date: JULY 2009	