CONSTRUCTION SPECIFICATION

MI-180. PIPELINE

1. SCOPE

The work shall consist of furnishing materials and installing all components of the above or below ground pipeline, as outlined in this specification and the drawings.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the drawings, or as listed below:

a. Pipe shall be clearly marked with the appropriate specification designation. Pipe shall conform to the requirements of one of the following ASTM specifications.
D 1785 Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
D 2239 Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter

b. Pressure pipe fittings and connections shall conform to the following specifications, as appropriate:
D 2466 Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
D 2467 Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
D 2609 Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe
D 3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
D 3036 Socket-type Polyvinyl Chloride (PVC) Plastic Line Couplings

c. Solvents for solvent-welded plastic pipe joints shall conform to the following ASTM specification:
D 2564 Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings

Appurtenances, such as valves and valve housings, shall be made of non-corrosive material and shall be installed according to manufacturer's recommendations, or as shown on the drawings. Backflow prevention valves shall be approved by the American Society of Sanitary Engineers, or be listed in the current edition of the Water Supply Cross Connection Rules Manual, Appendix G (Incorporated by the Water Bureau as a Supplement to Part 14 of the Administrative Rules under the Michigan Safe Drinking Water Act). Air gaps shall be a minimum of two times the supply pipe diameter.

3. HANDLING AND STORAGE

Pipe shall be delivered to the job site and handled by means which provide adequate support to the pipe and does not subject it to undue stresses or damage. When handling and placing plastic pipe, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting. All special handling requirements of the manufacturer shall be strictly observed. Special care shall be taken to avoid impact when the pipe must be handled at temperatures of 40°F or less.

Pipe shall be stored on a relatively flat surface so that the barrels are evenly supported. Unless the pipe is specifically treated to withstand exposure to ultraviolet radiation, it shall be covered with an opaque material when stored outdoors for a period of 15 days or longer.

4. PLACEMENT

Pipelines shall be placed so that they are protected against hazards imposed by traffic, livestock, farm operations, freezing temperatures, or soil cracking. Support for above ground pipeline crossings of drainage channels or other similar conditions shall be appropriate to the span, pipe material, and pipeline diameter. Avoid abrupt changes in grade to reduce the chance of pipe rupture.

Solvent cemented PVC pipe joints shall be in accordance with ASTM D 2855 Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.

Bell and spigot pipe shall be laid with the bell pointed upstream.

Plastic pipelines may be installed by plow-in equipment if soils are suitable.

For pipelines installed in trenches:

a. The pipe shall be laid to the lines and grades as shown on the drawings. The pipe shall not be dropped or dumped on the bedding or into the pipe trench. Trenches for plastic pipelines shall be free of rocks and other sharp-edged materials. The ground surface near the pipe trench shall be free of loose rocks and stones greater than 1 inch in diameter.

b. The pipe shall be firmly and uniformly bedded throughout its entire length. The bedding depth and materials to be used will be as shown on the drawings. For pipe with bell joints, the bedding material shall be excavated at the locations of the bells to prevent the pipe from being supported by the bells.

c. Just before placement, each pipe section shall be inspected to ensure that all foreign material is removed from inside the pipe. The pipe ends and the couplings shall be free of foreign material when assembled. At the completion of a work shift, all open ends of the pipeline shall be temporarily closed off using a suitable cover or plug. The temporarily closed pipeline shall be adequately anchored against flotation where necessary.

d. Care shall be taken to prevent distortion and damage during unusually hot (over 90°F) or cold weather (under 40°F). After the pipe has been assembled in the trench, it shall be allowed to reach ground temperature before backfilling to prevent pull out of joints due to thermal contraction.

5. BACKFILLING

All backfilling shall be completed before the pipeline is placed in service. The initial backfill shall be of selected material that is free of rocks or other sharp-edged material that can damage the pipe. Deformation or displacement of the pipe must not occur during backfilling.

Pipelines installed by the plow-in method require surface compaction and shaping in addition to the normal plow-in operations.

Backfilling shall be done in a workmanlike manner. Provisions shall be provided for stabilizing disturbed areas and controlling erosion, as necessary.