

## CONSTRUCTION SPECIFICATION

### MI-114. SUBSURFACE DRAINAGE SYSTEMS

#### 1. SCOPE

The work shall consist of furnishing and installing drain tubing and necessary fittings and appurtenances.

#### 2. MATERIALS

Corrugated polyethylene tubing shall conform to the requirements of ASTM F 405, ASTM F 667, ASTM F 894, AASHTO M 252, or AASHTO M 294 for the appropriate tubing sizes and fittings.

ASTM F 405	3-6 inch diameter pipe and fittings
ASTM F 667	8-, 10-, 12-, 15-, 18-, and 24-inch diameter pipe and fittings
ASTM F 894	18- to 120-inch diameter pipe and fittings
AASHTO M 252	3- to 10-inch diameter N12 pipe and fittings
AASHTO M 294	12- to 36-inch diameter N12 pipe and fittings

When perforations are specified, the water inlet area shall be a minimum of 1 square inch per lineal foot of tubing. The inlets either shall be circular perforations or slots equally spaced along the length and circumference of the tubing. Unless otherwise specified, circular perforations shall not exceed 3/16 inch in diameter, and slot perforations shall not be more than 1/8 inch wide.

The tubing shall be appropriately marked with ASTM or AASHTO designation.

#### 3. EXCAVATION

Unless otherwise specified or approved by the engineer, excavation for and subsequent installation of each tube line shall begin at the outlet end and progress up grade. The trench or excavation for the tubing shall be constructed to the lines, depths, cross sections, and grades shown on the drawings, or as approved by the NRCS inspector.

Trench shields, shoring and bracing, or other suitable methods necessary to safeguard the contractor's employees and the works of improvement and to prevent damage to the existing improvements shall be furnished, placed, and subsequently removed by the contractor.

#### 4. PREPARING THE TUBING BED AND BLINDING THE TUBING

When a granular filter or envelope is specified, the filter or envelope material shall be placed in the bottom of the trench just before the tubing is laid. The tubing shall then be laid and the filter and envelope material placed to a depth over the top of the tubing to not less than that shown on the drawings.

When a granular filter or envelope is not specified, the bottom of the trench shall be shaped to form a semicircular or trapezoidal groove in its center. This groove shall provide support for not less than a fourth of the outside circumference of the tubing. After the tubing is placed in the excavated groove, it shall be capped with friable material from the sides of the trench. The friable material shall be placed around the tubing, completely filling the trench to a depth of at least 3 inches over the top of the tubing. For material to be suitable, it must not contain hard clods, rocks, frozen soil, or fine material that will cause a silting hazard to the drain. Tubing placed during any day shall be blinded (place required soil material

around and over pipe) and temporarily capped before construction activities are completed for that day.

5. PLACEMENT AND JOINT COVERING

All tubing shall be installed to grade as shown on the drawings. After the tubing is placed in the trench and blinded, allow sufficient time for the tubing to adapt to the soil temperature before backfilling.

Maximum allowable stretch of the tubing is 5 percent. Special precautions must be implemented on hot, bright days to ensure that the stretch limit is not exceeded and excessive deflection does not occur as a result of installation procedures, including backfill operations.

Unless otherwise specified in section 9 of this specification or shown on the drawings, connections are made with manufactured junctions comparable in strength with the specified tubing. All split fittings shall be securely fastened with nylon cord or plastic zip ties before any backfill is placed. All buried ends shall be supplied with end caps unless otherwise approved by the NRCS Inspector.

6. CONNECTIONS

Lateral connections will be made with manufactured junctions comparable in strength with the specified tubing unless otherwise specified.

Where existing drain lines not shown on the drawings are crossed, they shall be bridged across the new trench or they shall be connected into the new drain lines, as directed by the NRCS inspector.

7. BACKFILLING

The backfilling of the trench shall be as shown on the drawings and completed as rapidly as is consistent with the soil conditions. Automatic backfilling machines may be used only when approved by the NRCS inspector. Backfill shall extend above the ground surface and be well rounded and centered over the trench.

Unless otherwise specified, where drain tile or tubing is laid under roads and at other designated locations shown on the drawings, the backfill shall be placed in successive layers of not more than 6 inches (150 mm) and each layer shall be tamped before the next layer is placed.