



# IRRIGATION WATER CONVEYANCE HIGH PRESSURE, UNDERGROUND, PLASTIC PIPELINE *Conservation Practice Job Sheet* **430-DD**

Natural Resources Conservation Service (NRCS)

December 2003



## DEFINITION

A pipeline and appurtenances installed in an irrigation system.

## SCOPE

This conservation practice applies to underground thermoplastic pipelines that are closed to the atmosphere and have a minimum pressure rating for water of 80 lb/in<sup>2</sup>.

Pipelines installed shall meet the requirements of NRCS conservation practice standard Irrigation Water Conveyance, High Pressure, Underground, Plastic Pipeline, Code 430DD.

## WHERE PRACTICE APPLIES

All pipelines shall be planned and located to serve as an integral part of an irrigation water distribution or conveyance system designed to facilitate the conservation use and management of the soil and water resources on a farm or group of farms.

Water supplies, water quality, and rates of irrigation delivery for the area served by the pipeline shall be sufficient to make irrigation practical for the crops to be grown and the irrigation water application method to be used.

Plastic pipelines shall be installed only in suitable soils where the bedding and backfill requirements can be fully met.

## INSTALLATION

When designing and installing irrigation pipeline, several factors must be considered.

- **Minimum Depth of Cover.** Pipe shall be installed at sufficient depth below the ground surface to provide protection from hazards imposed by traffic crossings, farming operations, freezing temperature, or soil cracking. The minimum depth shall be as specified in the specifications for each size and type of pipe.
- **Trench Construction.** The trench at any point below the top of the pipeline shall be only wide enough to permit the pipe to be easily placed and jointed and to allow the initial backfill material to be uniformly placed under the haunches and along the side of the pipe.

The trench bottom shall be uniform so that the pipe lies on the bottom without bridging. Clods, rocks, and uneven spots that can damage the pipe or cause non-uniform support shall be removed.
- **Placement.** Care shall be taken to prevent distortion and damage when handling the pipe during unusually warm or cold weather. The pipe shall be uniformly and continuously supported over its entire length on firm stable material.
- **Joints and Connections.** All joints and connections shall be designed and

constructed to withstand the design maximum working pressure for the pipeline without leakage and to leave the inside of the line free of any obstruction that may tend to reduce its capacity below design requirements.

All fittings, such as couplings, reducers, bends, tee, and crosses, shall be installed according to the recommendations of the pipe manufacturer.

- **Thrust Blocks.** Thrust blocks are normally required at any abrupt changes in pipeline grade, horizontal alignment, or reduction in pipe size. Thrust blocks may also be needed at the end of the pipeline and at in-line control valves.
- **Backfill.** The pipe must be backfilled to ensure proper operation and long life.

Hand, mechanical or water packing methods may be used for the initial backfill. The backfill material shall be soil or sand that is free from rocks or stones larger than 1 inch in diameter. At the time of placement, the moisture content of the material shall be such that the required degree of compaction can be obtained with the backfill method to be used. The initial backfill material shall be placed so that the pipe will not be displaced, excessively deformed, or damaged.

The final backfill material shall be free of large rocks, frozen clods and other debris greater than 3 inches in diameter. The material shall be placed and spread in approximately uniform layers so that there will be no unfilled spaces in the backfill and the backfill will be level with the natural ground or at the design grade required to provide the minimum depth of cover after settlement.

All special back filling requirements of the pipe manufacturer shall be met.

- **Check valves.** A check valve shall be installed between the pump discharge and the pipe where backflow may occur.
- **Air release valves.** The three basic types of air release valves installed on irrigation pipelines are described below:

An air-release valve releases pockets of air from the pipeline once the line is filled and under working pressure. This valve shall be used as needed to permit air to escape from the pipeline while the line is at working pressure.

An air-and-vacuum valve exhausts large quantities of air from the pipeline during filling and allows air to reenter the line and prevents a vacuum from forming during emptying. This valve shall be installed at all summits, at the entrance, and at the ends of the pipeline.

A combination air valve is sometimes called a combination air-release and air-vacuum valve or combination air-and-vacuum-relief valve. It is continuous acting and combines the functions of both the air-release valve and the air-and-vacuum valve. This valve can be used in lieu of either the air-release valve or the air-and-vacuum valve.

- **Pressure-relief valves.** A pressure relief valve shall be installed if excessive pressure can build up when all valves are closed.
- **Basis of Acceptance.** The acceptability of the pipeline shall be determined by inspections to check compliance with the plans and specifications.
- **Certifications and Guarantee.** The seal of approval of recognized laboratory on pipe bearing one of the ASTM designations listed in the conservation practice standard may be accepted for this certification.

The installing contractor shall certify that his/her installation complies with the requirements of this standard. The contractor shall furnish a written guarantee that protects the owner against defective workmanship and materials for not less than 1 year. The certification identifies the manufacturer and markings of the pipe used.

For specific criteria in applying this practice, review NRCS conservation practice standard Irrigation Water Conveyance, High Pressure, Underground, Plastic Pipeline, Code 430DD.

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**CONTRACTOR CERTIFICATION AND GUARANTEE FOR IRRIGATION PIPELINE INSTALLATION**

SWCD: \_\_\_\_\_ Field Office: \_\_\_\_\_

Cooperator: \_\_\_\_\_ Location: \_\_\_\_\_

I, the undersigned, completed the installation of \_\_\_\_\_ feet of pipeline on the \_\_\_\_\_ farm, \_\_\_\_\_

\_\_\_\_\_ (Name) \_\_\_\_\_ (Address)  
 on \_\_\_\_\_, (Date) and certify that the material and installation comply with requirements of the NRCS

Conservation Practice Standard and Specification for Irrigation Water Conveyance, High Pressure Underground Plastic Pipeline, dated \_\_\_\_\_. This work is guaranteed against defective workmanship and materials for a period of \_\_\_\_\_ year(s) from date shown as installed.  
 (one year minimum)

(See appropriate standard for markings required. Not all of the following are applicable for each type of pipe.)

Manufacturer						
Manufacturer's identification						
Nominal pipe size (inch)						
Type of pipe material (PVC 1120)						
Pipe classification, pressure rating (lbs/in <sup>2</sup> ) or maximum working head (ft or lbs/in <sup>2</sup> )						
Specification designation with which the pipe complies (IPS, PIP,ASTM Designation, D-2241)						
SDR No.						
Length of each pipe installed						

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Firm: \_\_\_\_\_ Address: \_\_\_\_\_