

CONSTRUCTION SPECIFICATIONS
NATURAL RESOURCES CONSERVATION SERVICE
UNDERGROUND OUTLET

Scope

This work shall consist of excavating, shaping, filling, and installing conduit and appurtenances to the lines and grades shown in the plans or as staked in the field and in accordance with recommendations of the manufacturer. Construction operations shall be done in such a manner that erosion, water, air, and noise pollution will be minimized and held within limits as established by state regulations.

General

The installing contractor shall certify that his installation complies with the requirements of these specifications, and shall name the source and quality of materials used.

Materials

All conduits and other materials used for underground outlets shall be satisfactory for intended use and shall meet the applicable material specifications and requirements.

Inspection and Handling of Materials

Material for underground outlets shall be given a careful inspection before installation. Where applicable, clay and concrete tile shall be checked for damage from freezing and thawing prior to installation. Plastic pipe and tubing shall be protected from hazards causing deformation or warping. Plastic pipe and tubing with physical imperfections shall not be installed. A damaged section shall be removed and a suitable joint made connecting the replaced and retained sections. All material shall be satisfactory for its intended use and shall meet applicable specifications and requirements.

Specifications for Materials

All materials currently acceptable for installation as underground outlets shall meet the requirements of 606 Subsurface Drains. Large diameter corrugated polyethylene plastic tubing and fittings (10", 12", and 15" diameter) will be allowed when all heavy-duty requirements in ASTM F405 are met.

Materials for stilling basin outlets shall be durable, corrosion resistant, fire resistant and suitable for the site, climatic and other controlling conditions. Acceptable materials include Reinforced Concrete (ASTM C-76), 14 gauge corrugated aluminum, 16 gauge corrugated steel, 1/4 inch welded steel, and cast in place reinforced concrete. Plastic pipe is not acceptable for vertical section of stilling wells.

Placement

The conduit of all underground outlets shall be laid to line and grade and bedded and backfilled with approved material to the ground surface as shown in the drawing or as described in the specification for the job. No reversals in grade of conduit will be permitted. Where the conduit is to be laid in a rock trench, or where rock is exposed at the bottom of the trench, the rock shall be removed below grade enough that the trench may be backfilled, compacted, and bedded. When completed, the conduit shall be at least 2 inches from rock. All outlet conduits will be installed with a minimum of 2 feet of soil cover.

Flexible conduits such as plastic pipe or tubing shall be installed in accordance with ASTM F449, "Standard Recommended Practice for Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control."

Earth backfill material shall be placed in the trench in such a manner that displacement of the conduit will not occur and the backfilling will meet the requirements of the plans and specifications. The backfill should be mechanically compacted to insure that underground outlets located under terraces or diversion ridges do not fail. The terrace or diversion ridges constructed across gullies or depressions and over underground outlets shall be compacted by machinery travel or other means sufficient to insure proper functioning of the terrace and underground outlet. The surface of the finished terrace, diversion, or other structure shall be reasonably smooth and accommodate ordinary farm equipment. Storage terraces will be constructed with a minimum of 0.25 feet of settlement and 0.25 feet of freeboard.

Auxiliary Structures

Auxiliary structures will be installed at the location and to dimensions, line, and grades shown on the plans. A minimum of ten feet of rigid pipe without joints or perforations shall be used at the outlet end of the line. A flap gate or another specified type of animal guard will be installed. The rigid pipe is not required when a deep well outlet is used.

Construction

Construction will normally begin at the outlet end and proceed upstream. When the conduit is placed, inspected, and checked, suitable joint protection material will be placed over joints and the fill on the sides of conduit will be tamped to retain alignment. As soon as possible, the work area shall be restored to former conditions or as required in the plans and specifications for the job. Vegetation or other protective measures shall be established promptly.

Maintenance

A maintenance program will be followed by the landowner or landuser to ensure a useful life for underground outlet systems. Many systems fail because of neglect of the drain and outlet. Emphasis will be placed on control measures to keep sediment from entering the system, the outlet free of obstructions, erosion; and protection against destruction by equipment, animals, and fire.