

DELAWARE CONSTRUCTION SPECIFICATION

STRUCTURAL BACKFILL CS 15

1. SCOPE

The work shall consist of backfilling around all structures as required by the drawing to the specified dimensions and compaction.

2. MATERIALS

The backfill material shall meet the following Unified Soil Classification: GM, GC, SM, or SC. Backfill shall contain no sod, brush, roots or other perishable materials. Rock particles having a maximum dimension of 3 inches shall be removed.

3. FOUNDATION PREPARATION

Except as otherwise specified, earth foundation surfaces shall be graded to remove surface irregularities and shall be scarified or otherwise acceptably scored and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the structural backfill, and the surface materials of the foundation shall be compacted and bonded with the first layer of structural backfill as specified for subsequent layers of structural backfill.

4. PLACEMENT

Backfill shall be placed in horizontal layers with a maximum thickness of 6 inches before compaction.

5. COMPACTION

Fill adjacent to structures shall be compacted by three passes of a manually directed compacting equipment. A vibrating plate compactor shall be used when the backfill material is identified as a GM or GC. A power tamper shall be used when the backfill material is identified as a SM or SC. Towed or self-propelled vibrating rollers shall not be operated within 5 feet of any structure. Compaction by means of drop weights operating from a crane or hoist will not be permitted.

Compaction of fill adjacent to concrete structures shall not be started until the following time intervals have elapsed after placement of the concrete.

<u>STRUCTURE</u>	<u>TIME INTERVAL</u>
Retaining walls and counterforts (impact basins)	14 days
Walls backfilled on both sides simultaneously	7 days
Conduits and spillway risers, cast-in-place (with inside forms in place)	7 days
Conduits and spillway risers, cast-in-place (inside forms removed)	14 days
Conduits, precast, cradled	2 days
Conduits, precast, bedded	1 day
Antiseep collars and cantilever outlet bents (backfilled both sides simultaneously)	3 days

6. **MOISTURE CONTENT**

Moisture content for the fill material at the time of compaction shall be such that the soil material will form a ball when squeezed in the hand. This ball will resist crumbling when pressed between two fingers. There shall be no free water left on the hand when the soil material is squeezed, and no water shall be observed when the soil ball is shaken on the palm of the hand.

The fill material shall be brought to the specified moisture range before compaction. Material that is too wet for compaction shall be allowed to dry before compaction or be removed.

7. **BACKFILL AROUND PIPES**

Backfill material in the pipe zone shall be free of large stones, clods or foreign material, and shall be hand placed and tamped to fill all space around the pipe with particular attention to the sides of the pipe. Pipe zone materials include the material in the haunching area and the initial backfill.

- a. The haunching area is the area between the invert of the pipe and the mid-point or springline. This is the most important in terms of limiting the deflection of flexible pipe.
- b. Initial backfill begins at the mid-point or springline of the pipe and extends 6 inches to 12 inches above the pipe. Compacting backfill materials above the springline gives little additional side support.

Earth backfill around pipes shall be placed in a manner which will prevent damage to the pipe and which will allow the pipe to assume the loads from the fill gradually and uniformly. The height of the fill shall be increased at approximately the same rate on both sides of the pipe. Special care shall be taken to prevent lifting the pipe by pressures exerted by tamping material under the haunches of the pipe.