149

# FILL, TEST-CONTROLLED COMPACTION

CIVIL
STANDARD ENGINEERING SPECIFICATION

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SC 5 E

## 1. SCOPE

This specification describes the materials and methods of placing and compacting fills with test-controlled compaction.

## 2. GENERAL

Specification SC1A applies to and is a part of this specification.

## 3. MATERIALS

**3.1** Materials shall be approved by Du Pont and shall be free of rock or gravel over 3 inches in greatest dimension, organic substances, sludge, rubbish, brush, limbs, frozen soil, and other objectionable substances which will prevent satisfactory compaction.

**3.2** Prior to submission for approval, the following ASTM tests shall be completed for each sample:

**a.** Grain size analysis per ASTM D 422

**b.** Modified Proctor moisture-density test per ASTM D 1557.

**c.** Liquid limit, plastic limit, and plasticity index per ASTM D 4318.

**3.3** Prior to starting fill operations, a minimum of 3 tests per ASTM D 1557 will be required for approved material.

## 4. PREPARATION

**4.1** Clearing, grubbing, demolition, excavation, and removal of topsoil shall be completed in accordance with SC1E, SC2E, and SC3E, before placing fill.

**4.2** If subgrade is a cohesive material, the surface shall be scarified to a minimum depth of 3 inches. If a granular material, the surface is not required to be scarified.

## 5. PLACING

The material shall be placed in successive uniform loose layers and to a depth at which uniform densities specified in section 6 can be obtained with the compacting equipment to be used. In no case shall any layer of loose material placed for compaction exceed 12 inches.

## 6. COMPACTION

**6.1** Each layer of fill shall be compacted to a dry density not less than 95 percent of maximum dry density as determined by ASTM D 1557.

**6.2** For tank farm containment dikes and dikes or berms for retention basins, the fill shall be placed on the wet side of optimum moisture content and compacted to 92 percent of maximum dry density per ASTM D 1557.

**6.3** If a cohesive material is used, the surface of each compacted layer shall be scarified to a minimum depth of 3 inches before placing the next layer. If a granular material is used, the surface of each compacted layer is not required to be scarified.

**6.4** All scarifying is to be done with a weighted disk harrow.

## 7. INSPECTION

**7.1** Inspection of densities and moisture contents during construction will be performed by Du Pont.

**7.2** Moisture-density tests such as rubber-balloon ASTM D 2167, sand-cone ASTM D 1556, nuclear density ASTM D 2922, or others will be made in accordance with the following minimum daily schedule:

Once every layer of fill, or
Once every 100 cubic yards of fill, or
Once every 3500 square feet of fill

whichever requires the greatest number of tests.

**7.3** Samples will be taken at the bottom one-third of each compacted layer.

**7.4** Fill sections failing to meet these specifications shall be removed and replaced or reworked until satisfactory to Du Pont.

## 8. DRAINAGE

Drainage, both temporary and permanent, shall be constructed and maintained during the performance of the work. The surface of unfinished fills shall be bladed smooth to a crown or grade at the conclusion of the day's work, or before shutdown for any cause, to permit runoff of water. Fill that has become saturated with water shall be removed to a depth determined by Du Pont. Such saturated fill shall be disposed of as directed by Du Pont or reconditioned to conform with this specification.

## 9. BORROW

Borrow, when required to complete fill material requirements, shall conform to SC6E.

## 10. MEASUREMENT

**10.1** Method of measurement for pay quantities under unit prices shall be on a cubic-yard basis. If fill is being accomplished by cut-and-fill method or from borrow pits, on which sections may be taken, unit prices paid for excavation shall cover payment for fill.

**10.2** If fill is furnished from sources which have not been measured by Du Pont, quantities will be determined from compacted material in place by cross sections made by Du Pont of the original and final surfaces.