

CONSTRUCTION SPECIFICATION

VA-723. EARTHFILL

1. SCOPE

The work will consist of placing the required earthfill to achieve the lines and grades indicated on the construction drawings.

2. MATERIALS

All earthfill materials will be obtained from required excavations and designated borrow areas. The selection of fill materials will be subject to approval by the NRCS or SWCD representative.

Earthfill materials will contain no sod, roots, frozen soil, snow or ice, or other perishable materials. Stones larger than 6 inches in diameter will be removed prior to compaction of the fill.

The type of materials that are acceptable will be as listed in this specification and/or described in the construction drawings.

3. FOUNDATION PREPARATION

Foundations for earthfill will be stripped to remove vegetation and other unsuitable materials.

Earth foundation surfaces will be graded to remove surface irregularities and scarified to a depth of not less than 2 inches.

4. PLACEMENT

Earthfill will not be placed upon a frozen surface, nor shall snow, ice or frozen material be incorporated in the fill.

Adjacent to structures, earthfill will be manually tamped in a manner which will prevent damage to the structures.

Earthfill in dams, levees and other structures designed to restrain the movement of water will be placed so as to meet the following additional requirements.

- a. The distribution of materials throughout each zone will be essentially uniform, and the fill will be free from lenses, pockets, streaks or layers of material differing substantially in texture, moisture content or gradation from the surrounding material.
- b. If the surface of any layer becomes too hard and smooth to achieve a suitable bond with the succeeding layer, it will be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed.
- c. The top surfaces of embankments will be maintained approximately level during construction, except that a crown or cross-slope of approximately 2 percent will be maintained to ensure effective drainage.
- d. Dam embankments will be constructed in continuous layers from abutment to abutment, except where openings to facilitate construction or to allow passage of stream flow during construction are specified.

5. CONTROL OF WATER CONTENT

The earthfill material will have a water content sufficient to achieve the required density. When kneaded in the hand, it will form a ball which does not readily separate when struck sharply with a pencil and will not extrude out of the hand when squeezed tightly.

If the top surface of the preceding layer of compacted fill or a foundation or abutment surface in the zone of contact with the earthfill becomes too dry to permit suitable bond, it will either be removed or scarified and wetted by sprinkling to an acceptable water content prior to placement of the next layer of fill.

If the top surface of the preceding layer of compacted fill or a foundation or abutment surface in the zone of contact with the earthfill becomes too slick or saturated, it will be allowed to dry and will be thoroughly scarified to a depth of not less than 2 inches before placing additional layers of fill.

6. COMPACTION

If a minimum required density is specified, each layer of earthfill will be compacted as necessary to obtain that density. The methods of compaction listed below are intended to achieve at least 90 percent of the maximum density as determined by the Standard Proctor Test, ASTM D698. Methods other than those listed below may need to be utilized to achieve the desired compaction. All earthfill materials will be placed and spread in layers not over 9 inches thick before compaction unless otherwise specified. Earthfill materials adjacent to structures will be placed and spread in layers not exceeding 4 inches in thickness before compaction. Each layer will be compacted by traversing the entire surface using one of the following methods:

- a. Tamping (Sheepsfoot) Roller - Minimum of 4 passes with contact pressure of at least 100 pounds per square inch (psi), at speeds not exceeding 5 miles per hour (mph).
- b. Pneumatic (Rubber Tire) Roller - Minimum of 4 passes with a wheel load of at least 18,000 pounds and a tire pressure of 80 psi, at speeds not exceeding 5 mph.
- c. Loaded Earth Moving Equipment - Minimum of 4 passes with a wheel load of at least 10 psi. Equipment speeds will not exceed 5 mph during compaction process.

The following limitations apply to this method:

- (1) Earthfill height will be less than 8 feet.
- (2) Earthfill will not have permanent water stored against it.

- d. Wheel Type Tractor (Farm Tractor) - Minimum of 4 passes with a wheel type tractor (minimum 100 horsepower) exerting a pressure of not less than 10 psi. Tractor speeds will not exceed 5 mph during compaction process.

The following limitations apply to this method:

- (1) Earthfill height will be less than 8 feet.
- (2) Earthfill will not have permanent water stored against it.

- e. Track Type Tractor (Crawler, Bulldozer) - Minimum of 4 passes with a track type tractor exerting a pressure of not less than 8 psi. Tractor speeds will not exceed 5 mph during compaction process.

The following limitations apply to this method:

- (1) Maximum loose lift thickness of 6 inches. Stones larger than 3 inches in diameter will be removed prior to compaction.
- (2) Earthfill height will be less than 8 feet.
- (3) Earthfill will not have permanent water stored against it.