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## Standard Guide for Installation of Geosynthetic Clay Liners<sup>1</sup>

This standard is issued under the fixed designation D 6072; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This guide provides directions for the installation of geosynthetic clay liners (GCLs) under field conditions typically present in environment lining applications.

1.2 This guide contains general installation guidelines. It is not intended to replace project-specific installation requirements as found in the contract drawings or specifications. In the event of a conflict, the requirements of the project specifications will supersede the requirements of this guide.

1.3 This guide does not purport to establish specific procedures for all climatic, geographical, hydraulic, or topographical conditions that may exist at a site. Appropriate installation procedures under atypical field conditions should be modified as necessary to maintain the integrity of the GCL and adjacent lining system components.

1.4 Different GCLs have different materials of construction with different physical properties. The procedures contained herein, therefore, may not be universally applicable to all GCLs under all field conditions.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 653 Terminology Relating to Soil, Rock, and Contained Fluids<sup>2</sup>

D 4439 Terminology for Geosynthetics<sup>3</sup>

### 3. Terminology

3.1 *Definitions*—For definitions of other geosynthetic terms used in this guide, refer to Terminology D 4439. For definitions of soil terms, refer to Terminology D 653.

#### 3.2 Description of Term Specific to This Standard:

3.2.1 *geosynthetic clay liner (GCL), n*—a manufactured hydraulic barrier consisting of clay bonded to a layer or layers of geosynthetics.

### 4. Significance and Use

4.1 For optimum performance, GCLs must be installed in

a manner that does not impact their physical, mechanical, and hydraulic properties.

4.2 This guide identifies the proper installation procedures and equipment for use by GCL designers, inspectors, and installers.

### 5. Procedure

5.1 The methods and equipment used for placement of the GCL can vary, but the primary objective of the process is to minimize the potential for GCL damage. The placement methods and equipment should be evaluated appropriately within this context.

#### 5.2 Subgrade Preparation:

5.2.1 For projects where the GCL is to be placed over an earthen subgrade, the subgrade surface must be prepared and approved prior to installation in accordance either with project specifications or with this guide. The surface should be firm and unyielding, with no abrupt elevation changes, voids and cracks, ice, or standing water.

5.2.2 The subgrade surface should be smooth and free of vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact the GCL. The subgrade surface shall be compacted in accordance with the project specifications. At a minimum, the subgrade should be rolled with a smooth-drum compactor of sufficient weight to remove any wheel ruts, footprints, or other abrupt grade changes. Furthermore, all protrusions extending more than 12 mm from the subgrade surface shall either be removed, crushed, or pushed into the surface with a smooth-drum compactor.

NOTE 1—The GCL may be installed on a frozen subgrade, but the subgrade soil in the unfrozen state should meet the requirements stated in 5.2.2.

#### 5.3 GCL Placement:

5.3.1 All handling of the GCL at the job site should be conducted in accordance with the GCL manufacturer's recommendations.

5.3.2 The GCL rolls are to be delivered to the working area of the site in their original packaging. Immediately prior to deployment, the packaging shall be carefully removed without damaging the GCL.

NOTE 2—The orientation of the GCL (that is, which side faces up) is important and shall be in accordance with the engineer's or supplier's requirements.

5.3.3 No equipment that could damage the GCL shall be allowed to travel directly on the GCL. Acceptable installation, for example, may be accomplished such that the GCL is unrolled in front of the backwards-moving deployment equipment (such as a front-end loader or bulldozer). If the equipment causes rutting of the subgrade, the subgrade must

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<sup>2</sup> Annual Book of ASTM Standards, Vol 04.08.

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.09.