



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

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### 1. Scope

1.1 This practice covers procedures for sampling geosynthetic clay liners (GCLs) for the purpose of laboratory testing. These procedures are designed to ensure that representative samples are obtained and properly packaged for submittal to a testing laboratory.

1.2 The procedures in this practice may be applied to samples of unhydrated GCLs obtained at the project site or at the production facility, prior to shipment to the project site.

1.3 It is assumed that the *number* of samples to be obtained has already been determined in the project specification, standard test method, or by prior agreement between the purchaser and seller. This practice covers only the methods for obtaining a pre-arranged number of samples and does not describe methods for obtaining individual specimens from the sample.

1.4 The values stated in SI units are to be regarded as the standard.

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 4354 Practice for Sampling of Geosynthetics for Testing<sup>2</sup>

D 4439 Terminology for Geosynthetics<sup>2</sup>

D 4873 Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples<sup>2</sup>

### 3. Terminology

#### 3.1 Definitions:

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

3.1.2 *sample, n*—a portion of a material which is taken for testing or for record purposes (See Practice D 4354).

3.1.3 *specimen, n*—a specific portion of a material or

laboratory sample upon which a test is performed or which is taken for that purpose (See Practice D 4354).

3.1.4 For definitions of other geosynthetic terms used in this practice, refer to Terminology D 4439.

### 4. Significance and Use

4.1 This practice provides a method by which samples of GCL may be obtained for laboratory testing. The practice applies to materials obtained either at a job site or at a production facility.

4.2 GCL samples obtained in accordance with this practice will be considered representative of the actual manufactured GCL.

4.3 The quantity of GCL received by the laboratory should be sufficient for the preparation of several representative test specimens for a variety of standardized physical, hydraulic, and mechanical tests commonly performed on GCLs.

4.4 The procedures in this practice should be used by plant and field personnel for obtaining GCL samples for laboratory testing.

### 5. Procedure

5.1 In accordance with the project specifications or with Practice D 4354, divide the shipment or other given quantity of GCL into lots, and select lot and laboratory samples. This will usually involve the selection of a certain number of finished GCL rolls from which samples will be cut.

5.2 Affix on the packaging of the GCL rolls to be sampled adhesive labels or other markings which clearly identify that the roll is to be sampled.

5.3 Record the label information from each roll to be sampled for future incorporation into within the quality assurance/quality control (QA/QC) documentation for the GCL.

5.4 Segregate the rolls identified for sampling. Refer to appropriate ASTM standard practices for the proper equipment and techniques for handling the GCL rolls.

5.5 Inspect the packaging of the selected GCL rolls for damage. Describe and record the damage, if any.

5.6 Remove the outer packaging from the GCL as carefully as possible, taking precautions not to damage the GCL and to preserve the packaging as much as possible for re-use after sampling is completed.

5.7 Obtain samples from the selected GCL rolls. The surface on which the GCL is cut shall be smooth, hard, and free of

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.09.

irregularities and potential contaminants. All samples shall be obtained by cutting across the full width of the roll end, perpendicular to the edges. Samples shall be cut with a sharp utility knife or other implement capable of making a clean, straight cut through all components of the GCL. Unless otherwise specified, the cut shall be made at a point that is 1.0 m from the exposed end of the roll.

**NOTE 1**—At the discretion of the engineer, shorter or narrower samples, or both, may be obtained provided that the packaging procedures in this guide are followed.

5.8 A unique sample number shall be written on the sample. Additional markings should be made on the sample to identify the machine direction and the top/bottom sides of the GCL.

5.9 The GCL sample shall then be manually rolled around a core at least 75 mm in diameter, in the same direction as the cut. Care should be taken to wind the GCL without slack. Wide strapping tape (50 mm) shall then be wound around the sample in at least two places to secure the loose end. Bentonite loss from the sample may be minimized by applying the tape around the roll ends.

5.10 At least two layers of plastic sheeting shall be used to wrap the GCL sample roll for shipment to the laboratory, so as to minimize GCL sample disturbance or changes in moisture content. A thin cellophane material may be used for the inner wrapping, provided it is wound securely and repeatedly around

the rolled sample. The outer sheeting shall be at least 0.15 mm (6 mils) in thickness and shall be wrapped to minimize the amount of GCL shifting within the wrapping.

5.11 To ensure proper sample chain-of-custody tracking, all shipping documents shall indicate the sample number, project name and contact, and laboratory name and contact.

5.12 If an additional sample from the same GCL roll is required for testing, 5.7 through 5.11 of this practice may be repeated on the exposed end of the roll until a sufficient amount of GCL is obtained.

**NOTE 2**—Additional material cut from the same roll is still considered part of the same sample therefore should not be designated any differently than those samples previously obtained from the same roll.

5.13 Samples should be transmitted to the laboratory in a manner that minimizes the amount elapsed time, sample handling, disturbances (such as moisture, vibration, impact, etc.) that could occur in transit. Expedited delivery will help to ensure that moisture content changes are minimized.

**NOTE 3**—These packaging procedures were developed under the assumption that the area from which specimens are obtained is at least 75 mm from the edges of the sample.

## 6. Keywords

6.1 GCL; geosynthetic clay liner; sample

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