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Standard Guide for Identification, Packaging, Handling, Storage, and Deployment of Fabricated Geomembrane Panels[1]

This standard is issued under the fixed designation D7865; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers guidelines for the identification, packaging, handling, storage, and deployment of fabricated geomembrane panels. This guide is not to be considered as all encompassing since each project involving fabricated panels presents its own challenges and special conditions.

1.2 This guide is intended to aid fabricators, suppliers, purchasers, and users of fabricated panels in the identification, packaging, handling, storage, and deployment of fabricated geomembrane panels.

1.3 This guide is written for factory-fabricated geomembrane panels only. Other geosynthetics use Guide D4873/D4873M as their guide.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D4439 Terminology for Geosynthetics

D4873/D4873M Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples

3. Terminology

3.1 *Definitions:*

3.1.1 Some with terms applying to this guide appear in Terminology D4439.

3.1.2 *accordion-folded and rolled panel, n*—refers to an accordion-folded fabricated panel that is first accordion-folded to the desired width and then rolled to form a finished, rolled bundle for transport.

3.1.3 *accordion-folded panel, n*—refers to a fabricated panel where the material is folded back and forth in a "Z" formation in the same principal direction as the seams. This folding takes a wider panel of material and makes it into a narrow stack. For example, a 30 m by 30 m prefabricated panel could be accordion-folded into a 3 m wide stack of material ten layers deep and 30 m long.

3.1.4 *double accordion-folded panel, n*—refers to an accordion-folded fabricated panel that is accordion-folded to the desired width and then accordion-folded in the length direction onto a pallet (or into a container). Double accordion-folded panels typically appear as a "cube" of material with square corners.

3.1.5 *fabricated panel, n*—refers to a geomembrane panel seamed at a fabrication facility into a larger panel than the original roll stock material. A fabricated panel may be a larger rectangular panel of geomembrane or may be a specific fabricated shape or may contain special job-specific detail work.

3.1.6 *rolled panel, n*—refers to a fabricated panel that is rolled from one end or in some cases from both ends to the middle.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *fabricator, n*—the person or organization by whom the geomembrane material is fabricated into a fabricated panel.

4. Significance and Use

4.1 For a fabricated panel to be properly used, it must be adequately identified and packaged. It must be handled and stored in such a way that its physical property values are not

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

degraded. Failure to follow good practice may result in the unnecessary failure of the fabricated panel in a properly designed application.

4.2 This guide is not intended to replace project-specific storage, handling, identification, packaging, or installation requirements or quality assurance programs.

5. Procedure

5.1 *Fabrication and Identification:*

5.1.1 Fabricated geomembrane panels are seamed to the customer-specified sizes according to previously agreed specifications. If a project layout is required then the fabricated panel is prepared according to the project layout. Special fabricated panels such as shaped panels or panels with fittings should be fabricated according to customer-approved drawings.

5.1.2 All fabricated geomembrane panels should be uniquely identified with a number or other identification markings. These identification markings should clearly identify where the panel will be placed in any project layout.

5.1.3 Identify each fabricated geomembrane panel with a durable, gummed, weather-resistant label or equivalent. One label should be placed directly on the material after fabrication and one label should be attached to the outside of the packaging.

5.1.4 Panel identification should include, at a minimum, the name of the fabricator, product or style number, and the unique panel identification number or marking. All designations should be clearly marked and readable for the anticipated storage period. The identification label should also include the width and length of the fabricated panel. For special fabricated panels, a description of the panel features is recommended.

5.1.5 All fabricated geomembrane panels should include a marking that shows how the panel will unroll or unfold onsite. This marking is important to the installer so that the panel can be properly positioned before deployment.

5.1.6 All seam tests and inspections should be completed prior to shipment of the panel. Weld tests and inspections should be fully documented.

NOTE 1—Seam test frequency and specifications are outside the scope of this guide. Refer to job specifications or industry standard specifications for information about tests and test frequency.

5.1.7 On projects where traceability is a requirement, QC documentation should make a clear connection between the unique panel marking, the weld test data for that panel, and the identification of the specific rolls that went into the making of the fabricated geomembrane panel.

5.2 *Folding, Rolling, and Packaging:*

5.2.1 The seaming of multiple strips of geomembrane into a fabricated panel results in a panel wider than the initial roll widths. This wider panel can either be rolled “as is” (rolled panel), or accordion-folded and then rolled or double accordion-folded for transport. Rolled panels are typically not wider than 10 m, as it is difficult to physically handle rolls this wide without damaging them. Most fabricated panels are accordion-folded to a narrower width of between 2 to 4 m.

5.2.2 An accordion-folded and rolled panel is wound onto a sturdy core suitable for the weight of the panel. Accordion-folded and rolled panels are often placed on a pallet for transport.

5.2.3 For double accordion-folded panels, the narrow accordion-folded panel is folded once more lengthwise onto a sturdy pallet (or often into a cardboard container or crate). The resulting package is typically rectangular. Double accordion-folded panels are often sized to fit into transport trucks.

5.2.4 When a pallet is used to support the fabricated geomembrane panel, it should extend past the finished dimensions of the panel. One or two layers of geotextile, geomembrane, cardboard, or other suitable material should be placed on the pallet to protect the finished panel from coming into direct contact with the pallet.

5.2.5 All pallets and crates should be inspected to make sure that there are no protruding fasteners that could damage the material. Pallets and crates should be in good condition.

5.2.6 Packaging for fabricated geomembrane panels should be suitably weather resistant for the anticipated storage conditions. A common packaging is a wrap of a weather-resistant material that protects the fabricated panel from UV damage and precipitation. Other packaging such as a large cardboard box with a lid is also sometimes used.

5.2.7 Slings, rope, or other handling and deployment aids are attached to the panel after the packaging is completed and often prior to the panel being placed on a pallet.

5.2.8 The outside label is applied and the unfolding marking is carefully checked and aligned on the packaged panel.

5.3 *Transportation, Handling, and Storage:*

5.3.1 Transport fabricated geomembranes to the project site using the most direct method. Transferring fabricated panels from truck to truck during interline transfers can cause damage due to handling. Direct shipments are recommended. If multiple handling is required, then adding protection to the sides of the packaging is recommended to protect the edges of the panel during interline transfers. If extensive handling is required in transit, then crating the panels is recommended.

5.3.2 While unloading or transferring the fabricated panels from one location to another, prevent damage to the wrapping and to the fabricated panel itself. If the fabricated panel is palletized or stored in a crate, a standard forklift with forks long enough to reach through the pallet or crate should be used.

5.3.3 Slings may be used to carry relatively large fabricated panels, provided that the slings do not cause damage to the panels. Do not drag the panels as damage may result.

5.3.4 Inspect fabricated panels at time of delivery to the site and make any claims for damage with the carrier. The receiving inspection should verify the number and identity of the panels, ensure that the packaging is intact and the panels are not damaged, and that the labels and deployment markings are in place.

5.3.5 Fabricated panels, when possible, should be stored on pallets off the ground. The storage area should be dry with a firm base. Ensure that the packaging on each panel remains in place and is suitable to protect the fabricated panels from ultraviolet radiation and other expected weathering.