



## TECHNICAL DROP-IN SPECIFICATION

Dura-Skrim® R12BV  
Reinforced Landfill Cover

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TECHNICAL DROP-IN SPECIFICATIONS

## REINFORCED LANDFILL COVER

Reinforced Landfill Cover (RLC): The Reinforced Landfill Cover serves to minimize the infiltration of precipitation within inactive portions of the landfill into the underlying leachate collection system. It is of great importance that the RLC be free from defects and installed free from damage.

### A. DESCRIPTION

#### 1. GENERAL:

The Contractor shall furnish all labor, material, and equipment to install RLC including all necessary and incidental items as detailed or required to complete the installation in accordance with the Contract Drawing and these Specifications

#### 2. RELATED WORK:

Related Contract Work is described in the following section of the specification as approved by the CQA Engineer.

#### 3. REFERENCE STANDARDS:

*ASTM D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.*

*ASTM D751 Standard Test Methods for Coated Fabrics.*

*ASTM D7004 Standard Test Method for Grab Tensile Properties of Reinforced Geomembranes.*

*ASTM D7003 Standard Test Method for Strip Tensile Properties of Reinforced Geomembranes.*

*ASTM D5884 Standard Test Method for Determining Tearing Strength of Internally Reinforced Geomembranes.*

*ASTM D6241 Standard Test Method for Determining the Puncture Strength of Geotextiles.*

The latest revision of the following standard of the Geosynthetic Research Institute (GRI) are hereby made a part of these specifications:

*GRI GM22 Standard Specification for Test Methods, Required Properties and Testing Frequencies for Scrim Reinforced Polyethylene Geomembranes Used in Exposed Temporary Applications*

#### 4. QUALITY ASSURANCE:

Quality Assurance during installation of RLC will be provided by the Owner as described in the accompanying Project CQA Manual.

#### 5. MANUFACTURERS QUALIFICATIONS:

- a. The Manufacturer shall have previously demonstrated his ability to produce the required RLC by having successfully manufactured a minimum of 20,000,000 ft<sup>2</sup> of string reinforced RLC.
- b. Manufacturer must be ISO 9001 certified

#### 6. INSTALLER QUALIFICATIONS:

The RLC Installer shall have installed a minimum of 500,000 ft<sup>2</sup> of RLC (or similar material) in similar landfill installations.

## 7. WARRANTIES:

Manufacturer of the RLC will warrant the material to the installer on a pro rata basis for five years after the final acceptance of the Work. This warranty shall include but not be limited to defects related to workmanship and manufacturing.

## B. MATERIALS

### 1. GENERAL:

The materials supplied under these Specifications shall consist of first-quality products designed and manufactured specifically for the purpose of this work, which shall have been satisfactorily demonstrated, by prior use, to be suitable and durable for such purposes.

The RLC shall be supplied in panels which shall be of maximum size to provide the largest manageable sheet for the fewest seams. (45,000 ft<sup>2</sup> typical) Labels on the panels shall identify the thickness, length, width, lot and panel numbers, and name of Manufacturer.

### 2. RLC MATERIALS:

- a. RLC shall be manufactured to meet the following requirements:
  1. Provide finished product free from holes, pin holes, bubbles, blisters, excessive gels, undispersed resins and/or carbon black, or contamination by foreign matter.
  2. RLC shall be a geomembrane composed of a four-layer reinforced extrusion laminate, with the outer black layers being a high-strength polyethylene film, with a minimum average thickness of 4 mils; which are laminated together using molten polyethylene incorporating a 1000 denier scrim. RLC shall have the physical properties as shown in Table 1 of this section. Properties of RLC shall meet or exceed the requirements of GRI GM22 (Category 2 - Moderate - 12 mil nominal) or shall be an approved RLC as listed below.
  3. RLC shall be impermeable, capable of repelling water with no absorption.
- b. Approved RLC:
  1. Dura-Skrim 12BV as manufactured by Raven Industries of Sioux Falls, SD.  
Equal material, as approved by the Engineer.

### 3. SEAMING MATERIALS:

Thread for sewing the RLC seams shall be black polyester, or as approved by the Engineer.

### 4. BALLAST SYSTEM:

The sandbags shall be from the same material as the (parent) RLC. The Contractor shall place ballast as approved by the Engineer on top of the RLC over the entire area covered by the RLC, spaced as shown on the Contract Drawings.

## C. SUBMITTALS

The Contractor shall submit the following to the CQA Engineer:

### 1. PRE-INSTALLATION REQUIREMENTS:

Prior to RLC installation the Contractor shall submit the following:

- a. Certificate of Conformance and Sample: Prior to shipping to the site, the Contractor shall submit a certificate or affidavit signed by a legally authorized official of the Manufacturer for the RLC attesting that the RLC meets the physical and manufacturing requirements stated in these Specifications. The Contractor shall also submit a sample of the RLC to be used. The sample shall be labeled with the product name and be accompanied by the Manufacturer's specifications.
- b. Shipping, Handling, and Storage Instructions: The Manufacturer's plan for shipping, handling, and storage shall be submitted for review.
- c. Installation Procedures:  
 Submit installation procedures for carrying out the work. Installation procedures to be addressed shall include but not be limited to material installation, repair, and protection to be provided in the event of rain or strong winds. With regard to protection, the Contractor shall provide a plan of anchoring the RLC sufficient to satisfy the Contractor's Performance Warranty. This plan shall be approved by the Engineer prior to construction.  
 Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into the construction.

## 2. POST-INSTALLATION REQUIREMENTS:

Upon completion of the RLC installation, the Contractor shall submit the following:

- a. Completed material performance warranty.

## D. CONSTRUCTION

### 1. SHIPPING, HANDLING, AND STORAGE:

The RLC shall be shipped, handled, and stored in strict accordance with the Manufacturer's recommendations.

### 2. SUBGRADE PREPARATION:

The surface of the subgrade shall be as determined by the CQA Engineer

### 3. RLC PLACEMENT:

- a. Weather Conditions:  
 RCL placement shall not proceed at an ambient temperature below 32° F or above 100° F unless otherwise authorized, in writing, by the Engineer. RCL placement shall not be performed during precipitation, excessive moisture, in an area of ponded water, or in excessive winds. Any portion of RCL or subgrade damaged due to weather conditions shall be repaired at the Contractor's cost.
- b. Method of Placement:
  1. Each panel of the RLC shall be installed in accordance with the Manufacturer's recommendations.
  2. The CQA Engineer shall inspect each panel, after placement and prior to seaming, for damage and/or defects. Defective or damaged panels shall be replaced or repaired, as approved by the CQA Engineer and as described in this section.
  3. The Installer shall avoid dragging the RLC on rough soil subgrades
  4. Personnel working on the RLC shall not smoke, wear damaging shoes, or involve themselves in any activity that may damage the RLC, in the opinion of the CQA Engineer.
  5. The RCL shall be properly weighted to avoid uplift due to wind.
  6. Vehicular traffic across the RLC shall not be allowed.

7. The RLC shall be kept free of debris, unnecessary tools, and materials. In general, the RLC area shall remain neat in appearance.
8. The RLC shall be weighted with filled sandbags, each weighing a minimum of 30 pounds.
9. The sandbags shall be spaced as shown on the Contract Drawings, as approved by the CQA Engineer.
10. Rope securing the sandbags shall be as approved by the CQA Engineer
11. Along its perimeter, the RLC shall be anchored in a backfilled and compacted anchor trench as approved by the CQA Engineer

c. Pipe Penetrations:

Pipe penetrations through the RLC shall be as approved by the CQA Engineer

4. FIELD SEAMS:

- a. Field seams shall be made according to the manufacturer’s recommendations and may include sewing, fusion welding, or other methods as appropriate for the selected material and as approved by the engineer.

Individual panels of RLC shall be laid out and overlapped by a minimum of 4 inches prior to seaming. The area to be seamed shall be cleaned and prepared in accordance with the Manufacturer's recommendations.

5. REPAIR PROCEDURES:

Any portion of the RLC exhibiting signs of defect shall be repaired. Several procedures exist for the repair of these areas. The final decision as to the appropriate repair procedure shall be made by the CQA Engineer.

6. BALLASTING:

The Contractor shall add ballasting in accordance with the approved plan.

No overlying material shall be placed over the RLC until approved by the CQA Engineer.

TABLE 1: REQUIRED RLC PROPERTIES

PROPERTY	TEST METHOD	IMPERIAL UNITS	METRIC UNITS	IMPERIAL MIN. ROLL AVERAGES	METRIC MIN. ROLL AVERAGES
Thickness	Nominal	mils	mm	12	0.30
Weight	ASTM D 751	lbs/msf	g/m <sup>2</sup>	57	278
Grab Tensile Strength	ASTM D 7004	lbs	N	100	445
Tensile Elongation at Break	ASTM D 7003	%		600	
Tongue Tear	ASTM D 5884	lbs	N	46	205
CBR Puncture Resistance	ASTM D6241	lbs	N	265	1179

Notes:

1. The Engineer may allow alternates to these requirements.