

**Part III
Attachment III-D
Appendix III-D.7**

LINER QUALITY CONTROL PLAN

**Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas**

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

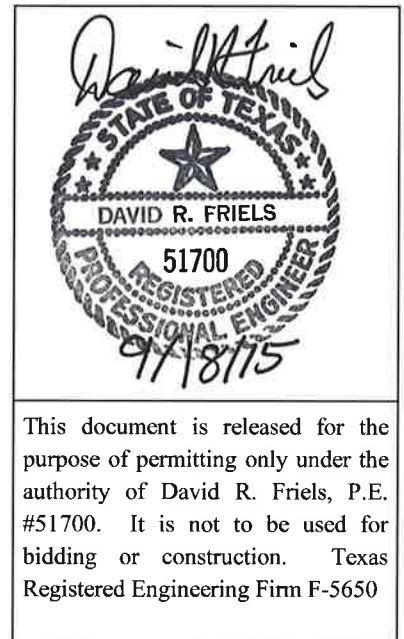
**Initial Submittal March 2015
Revised September 2015**

**Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041**

**Prepared by:
CB&I Environmental and
Infrastructure, Inc.**



**12005 Ford Rd, Suite 600
Dallas, TX 75234**



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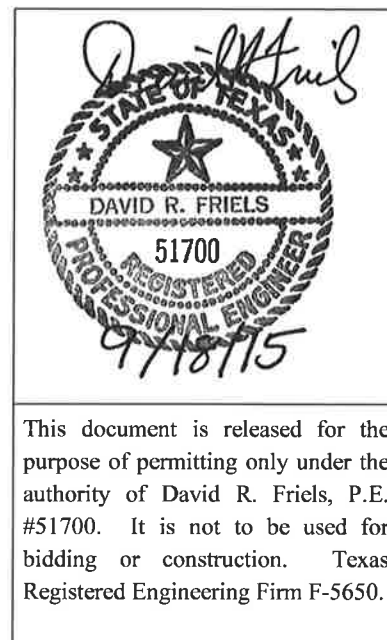
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Appendix III-D.7-1 Poorly Permeable Demonstration



3.0 COMPACTED SOIL LINER

This section covers construction, inspection, and testing of the compacted soil liner (CSL) component of the composite liner system. The CQA monitor shall provide continuous observations during the CSL construction in accordance with §330.339(a)(2). The minimum CSL thickness, measured perpendicular to the surface being lined, will be as specified for the specific cell (i.e., 2 or 3 feet).

3.1 Liner Soil Requirements

The soil used for the compacted CSL shall be a cohesive, predominantly fine grained soil that meets or exceeds the following requirements:

- Clean and free of conspicuous organics, roots, or other debris
- Atterberg Liquid Limit (LL) not less than 30%, and Plasticity Index (PI) of not less than 15 (ASTM D 4318)
- Maximum particle size of 1 inch, at least 30% passing the No. 200 mesh sieve and no more than 10% by weight of rocks and stones (ASTM D 422 or 1140)
- Coefficient of permeability (hydraulic conductivity) of no greater than 1.0×10^{-7} cm/sec (Appendix VII of the U.S. Army Corps of Engineers Manual EM1110-2-1906 or ASTM D5084)

3.2 Preliminary Sampling and Testing Procedures

Preliminary soil sampling and testing will be performed on materials planned for use in soil liner construction to determine certain physical and engineering properties and verify the soil is suitable for construction of liners. Only clay soils that can be mechanically compacted to meet a coefficient of permeability (hydraulic conductivity) of no greater than 1.0×10^{-7} cm/sec and comply with the other requirements listed in 3.1 above may be used for liner construction.

Composite samples will be obtained by collecting equal volumes of clayey material from a number of locations within the liner material source. If material characteristics appear to change within the stockpile or borrow area, one composite sample will be obtained from each material

- The contact surfaces of the sheets are clean, free of dust, grease, dirt, debris, and moisture prior to welding and the weld is free of dust, rocks, and other debris.
- The seams are overlapped in the downgrade direction a minimum of 4 inches or in accordance with manufacturer's recommendations for welding.
- Seams are oriented parallel to the line of maximum slope with no horizontal seams on side slopes that are steeper than 6H:1V (except for the designed partial slope liner where the panel extends from the upper anchor trench to 5 feet past the lower anchor trench or toe of the slope). In corners and odd-shaped geometric locations, the number of field seams should be minimized.
- No solvents or adhesives are present in the seam area.
- The procedure used to temporarily hold the panels together does not damage the panels and does not preclude CQA testing.
- At the end of each day or installation segment, all unseamed edges are anchored with sandbags or other approved methods. Penetration anchors or other methods that will damage the GM or underlying CSL shall not be used.

5.5 Field Seam Evaluations

5.5.1 Nondestructive Seam Testing

The purpose of nondestructive testing is to detect discontinuities or holes in the seam. It also indicates whether a seam is continuous and non-leaking. Nondestructive tests are required for all GM seams and repairs and include vacuum testing and air pressure testing. Nondestructive testing must be performed over the entire length of all seams where possible.

Nondestructive testing is performed entirely by the contractor. The CQA monitor's responsibility is to observe and document that testing performance is in compliance with the specifications and document any seam defects and their repairs.

Nondestructive testing procedures are described below.

- At least 4 out of 5 coupons fail in FTB.

5.6.3 Shear Test Requirement

The minimum shear test strength value will be 95 percent of the manufacturer's parent sheet strength and not less than 120 ppi. A passing extrusion or fusion weld will be achieved in shear when the yield strength for 4 out of 5 coupons is not less than the above minimum shear strength value, and the average for all 5 coupons is not less than the minimum value.

5.7 Failing Seam Tests

If a destructive seam test does not meet the criteria given above for either the field or laboratory, the sample will fail and the seam will be considered unsatisfactory. The contractor may cap the seam between two passing tests or take two additional samples approximately 10 feet (or more) in either direction from the failing test and conduct retests. If either of the retests fails, the procedure shall be continued until the unsatisfactory seam is bracketed by passing seam tests. The unsatisfactory section of seam must then be capped full length each direction to passing tests. It will also be an option to terminate the cap at the end (or beginning) of the seam welded that day by the combination of welder and machine. That is, it will not be necessary to cap (or test) forward or back from the beginning or ending of seaming for that operator and machine for that day.

For tracking purposes the retest samples will be given letter identifiers. "A" will be used to designate a sample after or forward in the direction of welding, and "B" will be used to designate the sample back (in the direction of welding). Therefore, if destructive sample 6 (DS-6) fails, the two retest samples are DS-6A (forward) and DS-6B (back). Numbers will be used if additional tests are required; e.g., DS-6A1, DS-6A2.

5.8 Repairs

5.8.1 Repair Procedures

Any portion of the GM with a detected flaw, which fails a nondestructive or destructive test, where destructive tests were cut, or where nondestructive test left cuts or holes, must be repaired