



Repair of Penetrations into the Liner, Barrier, or Added Geologic Material

Applicable Rule

C&DD: 3745-400-08(C)(2)

Purpose

The C&DD rules state that when collecting undisturbed samples to verify the permeability of each lift of the recompacted soil liner (RSL), the soil barrier layer (SBL), or the added geologic material (AGM), that "any penetrations shall be repaired using methods acceptable to the licensing authority". The purpose of this document is to outline those methods acceptable to Ohio EPA when Ohio EPA is the licensing authority.

If Ohio EPA is not the licensing authority, then contact the local health department. The local health department may have other methods of repair that they accept.

Applicability

Owners and operators of C&DD facilities constructing an RSL, SBL, or AGM and are licensed by Ohio EPA.

Background

The C&DD rules require that undisturbed samples taken from the compacted lifts of the RSL, SBL, or AGM, be tested for permeability. The purpose of this testing is to verify that the constructed soil meets the standard of 1×10^{-6} cm/sec. It is anticipated that most owners and operators will chose to take shelby tube samples, rather than conduct in-situ field testing.

Procedure

The following procedures are recommended by DMWM as acceptable methods for repair of penetrations in C&DD facility recompacted soil liners (RSL), soil barrier layers (SBL), and added geologic material (AGM) caused by extracting an undisturbed sample.

1. The penetration should be backfilled with sodium-bentonite granules, chips, or pellets, having a minimum particle size of 1/4 inch and a maximum particle size of 3/8 inch. Other types of bentonite have shown a susceptibility to chemical attack by organics and leachate. These particle size limits were chosen to counteract the free swell potential of bentonite, eliminate bridging, and aid in the hydration of the material.
 - Place an approximately 1 inch lift of sodium-bentonite into the penetration. This lift thickness will ensure complete hydration, eliminate bridging of material, and ensure compaction of the bentonite up against the sidewall to eliminate this pathway.
 - Hand tamp with a suitable device to eliminate voids.
 - Slowly pour water into the penetration until the water surface is level with the bentonite surface.
 - Repeat the procedure until the penetration is filled.
 - Repair of these penetrations must be inspected and documented by quality control personnel. This should at a minimum include the repair procedure, location, elevation, date, time, temperature and atmospheric conditions. This record should then be placed with other Construction Certification Report support documentation and be available for review by DMWM personnel.

Repair of Penetrations into the Liner, Barrier, or Added Geologic Material

2. Another method of repair is to scrape out the soil in the area of the test and recompact using the same soil. This may be more practical in some situations. This method follows the construction requirement for RSLs, SBLs, and AGMs.
 - A bowl shaped depression surrounding the disturbance should be scraped out with a dozer or other suitable device.
 - The depth of excavation (bowl shaped depression) should be at least as deep as the penetration and lessen to existing grade radially outward.
 - The radius of excavation should be approximately 1 foot for each inch of depth, with a minimum radius of approximately 8 feet. These specifications for the excavation radius are for ease of field calculations and to ensure a good interface bond.
 - The surface of the excavated area should be scarified before placement of the loose lift.
 - Loose lift thickness must not exceed a depth of 8 inches.
 - Repair must be inspected and documented by quality control personnel. This should at a minimum include the repair procedure, location, elevation, date, time, temperature and atmospheric conditions. This record should then be placed with other Construction Certification Report support documentation and be available for review by DMWM personnel.
3. DMWM recommends contacting the appropriate district office if field testing for permeability is to be conducted. Such in-situ field methods as infiltrometer tests and the two-stage field permeability test (Boutwell permeameter) result in a different penetration than extracting a shelby tube sample. If the owner or operator does not contact the district office in advance, the owner or operator is running the risk of having to reconstruct the RSL, SBL, or AGM.

It is also recommended that any penetrations in the RSL, SBL, or AGM in sequential lifts should be at least 20 feet apart. This is to prevent successive repairs from being placed atop one another, and to inhibit horizontal fluid migration in the lift interfaces from one repair to another.

Contact

If the Licensing Authority is Ohio EPA, and have questions regarding this document or would like additional information, please contact:

Central District Office DMWM Supervisor (614) 728-3778

Northeast District Office DMWM Supervisor (330) 963-1200

Northwest District Office DMWM Supervisor (419) 352-8461

Southeast District Office DMWM Supervisor (740) 385-8501

Southwest District Office DMWM Supervisor (937) 285-6357

Central Office Authorizing Actions and Engineering Unit (614) 644-2621

Otherwise, contact the local health department.

Disclaimer

This document is intended for guidance purposes only. Completion of the activities and procedures outlined in this document shall not release an owner or operator from any requirement or obligation for complying with Ohio Revised Code (ORC) Chapter 3734 or 3714 if appropriate, the OAC rules adopted thereunder, or any authorizing documents or orders issued thereunder, nor shall it prevent Ohio EPA from pursuing enforcement actions to require compliance with ORC Chapter 3734 or 3714, the OAC rules or any authorizing documents or orders issued thereunder.