



Use of Settlement Plates for Confirmation of Cap Construction

Applicable Rules

MSW: OAC 3745-27-08(H)
ISW: OAC 3745-29-08(H)
RSW: OAC 3745-30-07(B)
Tires: OAC 3745-27-72(H)
C&DD: OAC 3745-400-08(A)(3) and (B)

Purpose

This document outlines how settlement plates may be used for confirmation of cap construction.

Applicability

This document applies to owners and operators experiencing significant settlement during cap construction of municipal (MSW), industrial (ISW), and residual (RSW) solid waste landfills, scrap tire monofills, and construction and demolition debris (C&DD) facilities.

The principles covered in this document can also be used for construction of transitional covers and separatory liners.

Background

Some sites have experienced significant settlement while constructing final cap. Survey results of elevation, slope, and layer/cap system thickness showed an insufficient thickness, resulting in the owner or operator using an excessive amount of soil to meet the approved grades.

In one case, cap construction proceeded in a circular pattern, so by the time cap construction was being completed, the area where construction began had settled 10 feet. In another case, settlement occurred with the first lift of barrier layer construction - the first lift was actually eight inches thick but was surveyed as being four inches thick.

Settlement plates used to confirm cap construction typically consist of a 2' x 2' plate with a rod long enough to extend through the layer/cap surface. Wooden stakes and 3/4" diameter steel rods have been used to attach to the plate or to push down to the plate. The plates are placed on the surface in a grid pattern. The elevations are surveyed and the cap layer is constructed to the proper thickness above the settlement plate.

Procedure

The use of settlement plates can be detrimental to the cap system's integrity (due to poor construction around the rod, poor repair of the rod penetrations, or poor repair of damage if construction equipment runs into and kicks up the rod). Therefore, use of settlement plates should be restricted to those cases where significant settlement during cap construction is experienced. Significant settlement can be shown by comparing survey results to construction records showing questionable layer and lift thicknesses or volume of soil used.

The use of settlement plates cannot replace surveying. The owner or operator will still need to survey the facility to confirm slope and elevation. Also, in lieu of settlement plates, frequent surveying can verify that the cap system layers are the correct thickness.

Prior to use of settlement plates to confirm cap layer construction, DMWM recommends the owner or operator contact the district office to discuss construction quality assurance and how the cap construction standards will be met in the areas

¹ Note: This document was originally published on the date noted above. DMWM re-issued the document to make it consistent with current formatting and publication standards after evaluating the content and determining it is still relevant and appropriate. No substantive changes were made to the document.

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around the settlement plates. If the cap construction does not meet the standards, a violation of the rule or permit may be cited and enforcement action may result.

DMWM recommends certain methods be used on certain layers.

For the soil barrier layer, DMWM recommends the method of pushing the rod down to the settlement plate. DMWM does not recommend using rods attached to plates because of questionable compaction and permeability around the protruding rod. When pushing rods down to the settlement plate, the owner or operator will need to address the following:

- Repair of holes left when rods are removed.
- Ability to locate the plate (metal detectors have not been successful).

For the cap protection layer (vegetative layer), DMWM recommends the method of using rods attached to the settlement plate. DMWM does not recommend pushing the rod down to the settlement plate because the rod may miss the plate and puncture the flexible membrane liner. If there is no flexible membrane liner, or a 12 inch drainage layer is in place, then the push method may be acceptable. When using the method of attaching rods to the settlement plate, the owner or operator will need to address the following:

- Repair of holes left when rods are detached.
- Repairs if construction equipment should run into a rod, kicking up the plate.

Contact

If you 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

Contact

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.