



Alternative Cap Systems for Construction & Demolition Debris Facilities

Applicable Rule

C&DD: OAC 3745-400-07(G)(2)

Purpose

The purpose of this document is to explore alternative cap designs, approval criteria, and approval mechanisms.

Applicability

This document is applicable to the owners and operators and licensing authorities of Construction & Demolition Debris (C&DD) program.

Background

OAC 3745-400-07(G)(2) describes two cap system designs: the **standard cap system** described in paragraph (G)(2)(a), and the **vegetative cap system** in paragraph (G)(2)(b). The standard cap system is required at all new facilities and on those areas of existing facilities where debris was placed after September 30, 1996 [OAC 3745-400-07(D)]. The standard cap system is comprised of a barrier layer, soil layer and dense vegetation. The vegetative cap system is required for those areas of an existing facility which has not had debris placed after September 30, 1996 and does not have dense vegetation [OAC 3745-400-07(E)]. The vegetative cap system is comprised of a soil layer and dense vegetation.

During rule writing it was envisioned that many C&DD facilities would have an end use incorporating buildings and parking lots, so a provision was incorporated for comparable materials. This provision states that **comparable materials and/or thicknesses may be used if the final cap system specified in this rule is not compatible with the end use.**

Procedure

RECOMMENDED ALTERNATIVE CAP SYSTEM APPROVAL CRITERIA

For proposed alternative cap system proposals, DMWM recommends that the following criteria be used to determine whether the proposal is acceptable.

1. The proposed cap system is compatible with the end use.
2. The proposed cap system will not create a nuisance, fire hazard, health hazard, or cause air pollution or water pollution.

The cap systems in the rules accomplish this by reducing the amount of infiltration and generation of leachate, and by providing a barrier between the debris and the surface environment. The two cap systems differ as to the degree of effectiveness in reducing infiltration and thus the generation of leachate. The proposal should be comparable to the cap system required for the area.

3. The proposed cap system is designed to eliminate ponding, promote drainage, and minimize erosion (< 5 tons per acre per year). For an alternative to the standard cap system, the slope is between 3% and 25%.

The use of comparable materials and/or thicknesses probably will not affect the design as it pertains to ponding or drainage. However, some materials may not be an appropriate choice to minimize erosion or to be stable on slopes.

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ALTERNATIVE CAP SYSTEM DESIGN EXAMPLES

Use of Geosynthetic Clay Liners:

Standard Cap System - Use of a geosynthetic clay liner to replace the layer of well compacted soil may be acceptable if the cap is shown to be stable (when bentonite hydrates there is a decrease in the internal angle of friction), and an adequate subbase (12 to 18 inches) is provided to support and protect the geosynthetic from the debris. Use of a geosynthetic clay liner to replace the six inches of soil is not an acceptable alternative because the geosynthetic will not support dense vegetation.

Vegetative Cap System - Use of geosynthetic clay liner to replace the six inches of soil is not an acceptable alternative because the geosynthetic will not support dense vegetation.

Paved surface (asphalt, concrete, building foundations):

Standard Cap Systems - The paved surface can replace the overlying vegetative layer. The standards for recompaction for the well compacted soil layer may need to be revised to suit the foundation requirements. The well compacted soil layer may also be thinner, however, the paved surface should be well maintained to minimize infiltration.

Vegetative Cap System - The paved surface can replace the vegetative cap system.

Unpaved surface (gravel):

Standard Cap System - The unpaved surface can replace the overlying vegetative layer. The thickness of the well compacted soil layer should not be reduced because the unpaved surface may not be a comparable barrier to infiltration.

Vegetative Cap System - The unpaved surface can replace the vegetative cap system.

OTHER ISSUES

Perforations - Some end uses may include perforations into the cap system. Perforations can include storm sewer catch basins, wells, and utility or light poles. To minimize infiltration, care must be taken to ensure that the interface between the cap system and the catch basin, well casing, or pole is sealed or covered. For example, bentonite or caulk/joint filler may be applied in the interface, a lip can be constructed to bridge the interface, or a flexible gasket can be inserted to accommodate expansion/contraction, settling, and vibrations.

Financial Assurance - As with any engineered component constructed during closure, financial assurance funds will be released in accordance with rule 3745-400-13 of the Administrative Code when construction of an engineered component identified in the final closure cost estimate is certified in accordance with rule 3745-400-08 of the Administrative Code, and is approved by the licensing authority.

APPROVAL MECHANISMS

Proposals to use comparable materials and/or thicknesses will fall in one of two categories. Those for which the cap system required by the rules is not compatible with the end use, and for those which the cap system required by the rules is compatible with the end use but the owner or operator desires to use other materials and/or thicknesses.

For those proposals where the cap system required by the rules is not compatible with the end use, the owner or operator may propose an alternative cap design in the Final Cap System Design Plan which is a part of the annual license application. Upon issuance of the license, the alternative cap design is approved.

For those proposals where the cap system required by the rules is compatible with the end use but the owner or operator desires to use other materials and/or thicknesses, the owner or operator may submit an exemption request from the rule requirement to the licensing authority.

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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

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.