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Erosion Prevention and Sediment Control Handbook

4.2.6.10 Topsoil Stockpiling



Source: TDEC

Definition and Purpose

Topsoil is the uppermost layers in a soil profile that is rich in organic matter and nutrients vital for plant growth. Typically, topsoil is darker in color and looser in compaction than other soils. Topsoil stockpiling refers to the act of scraping topsoil from a site before mass grading activities and reserving it for later use. It is used to provide a suitable soil medium to support vegetation growth for final stabilization.

Appropriate Applications

Topsoil stockpiling should be utilized on all construction sites where topsoil is available at the surface of the soil. When existing topsoil is not present, importing topsoil may be considered. Stockpiling topsoil is particularly important when vegetation is incorporated as part of final stabilization plans and 1) the existing soil structure is nutrient deficient, overly acidic or basic, or contains toxic substances/pollutants and it is unreasonable or infeasible to amend the existing soil structure (NCDEQ, 2013) and 2) the existing soil depth is too shallow (less than 20 inches depth of solum [upper layer of soil where biologic activity occurs and produce organic material and other minerals]) to provide adequate root depth and soil moisture (VDEQ, 2024).



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Limitations and Maintenance

Stockpiled areas require temporary stabilization or covering. Furthermore, sediment control measures such as silt fence (Section 4.4.10) or others must be installed around the downgradient perimeter of the stockpile to prevent sediment migration. Topsoiled areas should be inspected for erosion, depressions or ridges, rocks, and other foreign materials prior to beginning permanent vegetation applications.

Stripping, stockpiling, hauling, and importing topsoil may not be cost effective for all projects. In addition, topsoil may contain weeds, and soil appearance may be misleading as to whether in-situ soils are in fact topsoil. When in question, consult soil specialists to ensure these soils can support vegetation growth.

Planning and Design Considerations

Designers should consider costs, final grade elevations, and topsoil thickness on all projects. Field assessments and soil tests (e.g., ASTM D5268 – “Topsoil Used for Landscaping and Construction Purposes”) are recommended to confirm whether there is enough topsoil of suitable quality to justify stripping and stockpiling. Quality topsoil typically has a loamy texture, such as loam, sandy loam, silt loam, sandy clay loam, or clay loam, and should be relatively free of debris, trash, stumps, rocks, roots, and noxious weeds. Ideally, the pH of the topsoil should range from six to seven and a half, and soluble salt concentrations should not exceed 500 parts per million. Liming is an acceptable option to achieve a suitable topsoil pH when the existing pH is less than six but greater than 3.6 (if less than 3.6, the existing topsoil may not be suitable). Organic matter content should not be less than one and a half percent by weight, as it plays a vital role in supporting healthy vegetation. If on-site topsoil is lacking in these qualities, soil amendments and fertilizers, using guidance from Section 4.2.6.11, can be applied to the soil such that it will support vegetation. Otherwise, topsoil that meets the needed characteristics may need to be imported to the site. Another alternative is the use of engineered soil amendments, as determined by ASTM D5268.

It is helpful to evaluate the soil prior to grading to know if the topsoil will be suitable and to know if stripping the soil is a good use of time. Stripping should be conducted in the early phases of construction and should be limited to areas directly impacted by construction activities. Typically, stripping depths range from four to six inches but can vary based on soil type and the specific requirements of the project. It is essential to perform stripping when the soil is neither wet nor frozen to avoid degradation of soil structure (ALSWCC, 2018).

Stockpiling topsoil requires careful consideration of location and stabilization techniques. Stockpiles should be situated away from drainageways, steep slopes, and traffic routes to reduce erosion risks and logistical challenges. The location should ideally be on flat terrain,



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and sediment control measures should be installed on the downgradient sides to prevent sediment-laden runoff. Side slopes of the stockpile should not exceed a 2H:1V slope wherever possible. On large sites, smaller, strategically located piles may be preferred for efficient redistribution later.

To minimize soil loss and maintain the quality of stored topsoil, erosion control measures must be implemented based on the duration of stockpile inactivity. For stockpiling storage less than 14 days, sediment barriers such as silt fences or sediment tubes may be sufficient in providing sediment control. For periods longer than 14 days, but activity will resume in the near future, temporary vegetative cover is necessary to stabilize the pile. If the stockpile is to remain dormant for an extended period of time, establishing permanent vegetation is needed to prevent erosion and weed infestation. Refer to Section 4.2.6.11 for reapplication of topsoil to achieve permanent stabilization.

Example Application

No formal design or quantities are required for this measure and therefore are not presented here.

References

- ALSWCC. (2018). *Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas*.
- VDEQ. (2024). *Virginia Stormwater Management Handbook*.