

SWPPP Cut Sheet: Filtrex[®] Engineered Soil

Infiltration & Pollution Control Technology

PURPOSE & DESCRIPTION

Filtrex[®] Engineered soil is a **permanent storm water infiltration** practice used to reduce storm runoff volume and loading of sediment and soluble pollutants, such as nutrients, heavy metals, and petroleum hydrocarbons, from a contributing watershed or drainage area. Filtrex[®] Engineered soil is manufactured on site using Filtrex[®] GrowingMedia™ and native soil. Filtrex[®] Engineered soil manages storm water by:

- Reducing runoff volume through increased soil water holding capacity, and infiltration,
- Increasing infiltration by reducing runoff velocity,
- Reducing pollutant loads by reducing runoff volume,
- Chemical adsorption of nutrients and metals to humus colloids,
- Recycling nutrients and metals by plant uptake and microbial decomposition and uptake.

APPLICATION

Filtrex[®] Engineered soil is used in post-construction applications with permanent vegetation to increase infiltration and reduce sediment and soluble pollutant loading to receiving waters. Typically engineered soils are constructed for vegetated storm water collection systems; however, Engineered soil can be used in any landscape where overland sheet flow and subsurface flow (interflow) exists. Applications where Engineered soil may be required include:

- Bioretention ponds and rain gardens,
- Storm water and sediment retention ponds,
- Parking lot infiltration islands,
- Vegetated (green) roof systems,

- Upslope from storm water receiving or conveyance systems, including channels, ditches, streams, rivers, lakes, and wetlands,
- Runoff receiving areas from impervious surfaces/hardscapes, and source pollutant areas, including roads/highways, parking lots, land disturbing activities.

Engineered soil can also be used to reduce runoff velocity leaving or entering locations described above. Reducing runoff velocity will increase infiltration of storm runoff, thereby reducing runoff volume and pollutant loading. Engineered soil is generally used in permanent, post-construction applications where a variety of plant material including legumes, grasses, shrubs and trees can be utilized.

INSTALLATION

1. Engineered soil shall meet Filtrex[®] Engineered soil Specifications and use Filtrex[®] Growing Media™.
2. Contractor is required to be a Filtrex[®] Certified™ Installer determined by Filtrex[®] International, LLC (440-926-2607; www.filtrex.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (list at www.filtrex.com). Look for the Filtrex[®] Certified™ Installer Seal.
3. Engineered soil will be placed at locations indicated on plans as directed by the Engineer, and shall be applied evenly to 100% of the area where engineered soil is required.
4. Engineered soil shall be installed down slope and



- around areas contributing overland and subsurface storm water flows.
5. Engineered soil shall not be installed in areas of concentrated runoff flow without soil stabilization or armoring devices.
 6. Engineered soil shall not be installed on slopes greater than 3:1, and on slopes greater than 4:1 shall include slope stabilization practices.
 7. Engineered soil should not be installed in wet or frozen soils or prior to seasons where growing vegetation is difficult.
 8. Care should be given to existing root systems of trees and shrubs during construction of Engineered soil.
 9. Seed shall be thoroughly mixed with the GrowingMedia™ prior to construction of Engineered soil or surface applied with Growing Media™ at time of application.
 10. Land surface shall be cleared of debris, including rocks, roots, large clods, and sticks prior to Engineered soil installation or tillage.
 11. Soil may be prepared prior to GrowingMedia™ application by roto-tilling the native soil; or soil ripping may be used as a prerequisite if soil is too dense.
 12. Subsoil may be scarified to a depth of 4 in. (100mm) prior to GrowingMedia™ application.
 13. GrowingMedia™ shall be evenly applied to the soil surface at a depth of 2-4 in (50-100mm) or 270-540 cubic yd/ac (513-1026 cubic m/ha) using a pneumatic blower, spreader, or similar device (small installations may be done manually) and thoroughly roto-tilled into the native soil (several passes may be required); or
 14. GrowingMedia™ shall be mixed with native soil prior to construction using a loader, soil mixer, or similar equipment
 15. Soil incorporation and tillage shall be to a min. of 6 in (150mm) (unless restricted by tree roots or other natural constraints) and a max. of 12 in (300mm); or
 16. If subsoil is scarified to 4 in (100mm), soil incorporation should be 6-8 in (150-200mm).
 17. Engineered soil shall be thoroughly watered after installation and allowed to settle for 1 week; fine grading and hand rolling of Engineered soil may be required after installation.

INSPECTION AND MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event for 1st year after installation/ until permanent vegetation has established. If rilling occurs/vegetation does not establish, the area of

- application should be reapplied with Engineered soil. Runoff diversion devices, Slope protection, RECBs, or soil stabilizers should be considered until vegetation has established. Vegetation should be inspected for noxious/invasive weeds. Periodic infiltration rate tests may be performed to ensure system is performing correctly.
1. The Contractor shall maintain the Compost Engineered Soil™ in a functional condition at all times and it shall be routinely inspected.
 2. Heavy equipment should be limited on and near the engineered soil to prevent compaction that will reduce infiltration and permeability.
 3. If Engineered soil becomes compacted, or infiltration and permeability rates diminish significantly, Engineered soil shall be reinstalled or replaced with a functioning alternative.
 4. Engineered soil shall be maintained until a minimum uniform cover of 70% has been vegetated, permanent vegetation has established, or as required by the jurisdictional agency.
 5. Engineered soil may need to be irrigated in hot and dry weather and seasons, or arid and semi-arid climates to ensure vegetation establishment.
 6. Where Engineered soil fails, rilling occurs, or vegetation does not establish the Contractor will repair or provide an approved and functioning alternative.
 7. If Engineered soil is damaged by storm water runoff prior to vegetation establishment, temporary runoff diversion devices installed above the Engineered soil may be required.
 8. No additional fertilizer or lime is required for vegetation establishment and maintenance.
 9. Regular mowing of grass vegetation on Engineered soil to a minimum height of 4 in (100mm) and a maximum height of 10 in (250mm) will deter invasive weeds, allow sunlight to kill captured pathogens, and provide maximum sediment removal efficiency and sediment storage capacity in the vegetation.
 10. Organic debris and clippings should be left on-site to maintain soil organic content.
 11. Sediment shall be removed if it reaches 25% of the height of the vegetation (mowed) to prevent diversion of runoff and reduction of vegetation health and cover.



Figure 3.1. Engineering Design Drawing for Filtrexx® Engineered Soil

