PURPOSE & DESCRIPTION

Filtrexx® Compost Erosion Control Blanket [CECB]™ is a slope stabilization, erosion control, and vegetation establishment practice used on hill slopes to stabilize bare, disturbed, or erodable soils on and around construction activities. CECB is used for temporary and permanent slope erosion control and vegetation establishment applications. CECB is applied to a depth of 1.5 to 2 in (35-50mm) or 200-270 cubic yards/acre (385-513 cubic m/ha), and normally applied to hill slopes with pneumatic blower trucks or similar equipment. Filtrexx® LockDown™ Netting can be used to increase the stabilization and erosion control capabilities of CECB. LockDown Netting is a single net erosion control blanket stapled to the slope prior to application of the CECB (Section 5.4).

APPLICATION

CECB is used for slope stabilization, erosion control and vegetation establishment on disturbed, bare, or highly erodable soils during land disturbing and construction activities. CECB is typically used after final grading for temporary or permanent seeding applications. Custom seed mixes may be added to the CECB and applied directly to the slope. Non-seeded applications shall be considered a temporary form of erosion control. CECB can be used on slopes up to 2:1 without the use of additional soil stabilizers. Slopes greater than 2:1 require the use of LockDown Netting. CECB should not be used in areas of concentrated runoff flow. Filtrexx® SiltSoxx™ for slope interruption may be used with CECB to reduce effective slope lengths, runoff velocity, and the potential for rill erosion. See Figure 1.1 for an example of CECB.

ADVANTAGES AND DISADVANTAGES

Advantages

• CECB provides organic nutrients that are slow release for optimum uptake efficiency to establishing vegetation.
• CECB provides organic nutrients that are less prone to transport in storm runoff and pollution of surface waters, relative to mineral nutrients supplied by fertilizers.
• CECB provides organic nutrients which have been correlated to lower growth of invasive weeds relative to mineral nutrient fertilizers.
• CECB has the ability to bind and adsorb phosphorus, metals, and hydrocarbons that may be in storm water runoff.
• Microorganisms in CECB have the ability to degrade organic pollutants and cycle captured nutrients in storm water runoff.
• CECB is organic and 100% biodegradable, therefore can be left on site after permanent stabilization is complete, used in the landscape design, and/or seeded and planted with permanent vegetation.
• CECB can improve existing soil structure, soil aggregation, water permeability, aeration, and biological diversity after construction activity is complete, thereby increasing the likelihood that vegetation will be sustainable.
• CECB can increase soil carbon and organic matter which may increase water holding capacity and infiltration, and reduce runoff and erosion, which can be beneficial to storm water reduction and water quality over the long term.
• CECB may assist in qualification for LEED® Green Building Rating and Certification credits under LEED Building Design & Construction (BD+C), New Construction v4. Awarded credits may be possible from the categories of Sustainable Sites, Water Efficiency, Materials & Resources, and Innovation. Note: LEED is an independent program offered through the U.S. Green Building Council. LEED credits are determined on a per project basis by an independent auditing committee. Filtrexx neither guarantees nor assures LEED credits from the use of its products. LEED is a trademark of the U.S. Green Building Council.

Disadvantages

• If CECB does not use Filtrexx® GrowingMedia™ or follow Filtrexx International specifications performance may be greatly diminished.
• If not installed correctly, maintained or used for a purpose or intention that does not meet specifications, performance may be
- CEBC should not be the only form of site erosion and sediment control.
- CEBC should never be used in areas of concentrated runoff flow, including channels and drainage ditches unless in combination with a turf reinforcement mat (TRM).
- CEBC should not be used without additional support practices on slopes greater than 2:1, and should be used with caution on slopes greater than 1.5:1.
- CEBC may need to be reapplied if severe runoff occurs prior to vegetation establishment or where vegetation fails.

**GROWINGMEDIA™ CHARACTERISTICS**

Filtrexx CEBC uses only Filtrexx GrowingMedia, which is a composted material that is specifically designed to reduce runoff volume, slow runoff velocity, prevent splash and sheet erosion, and provide rapid establishment and permanent sustainability of vegetation. GrowingMedia has been third party tested and certified to meet minimum performance criteria defined by Filtrexx International. Performance parameters include: percent cover of vegetation, water holding capacity, pH, organic matter, nutrient and metals content, soluble salts, moisture content, biological stability, maturity bioassay, percent inert material, bulk density and particle size distribution. It should be noted that particle size distribution of GrowingMedia is one of the key components to effective performance and capacity of CEBC; therefore, Filtrexx International has conducted extensive research and development and review of state and federal specifications to create high performance and reliable CEBC. For information on the physical, chemical, and biological properties of GrowingMedia refer to Specification 6.2 Filtrexx® GrowingMedia™.

**PERFORMANCE**

QA/QC material testing of GrowingMedia, to ensure specifications are met, is conducted by the Soil Control Lab, Inc. Performance testing and research of CEBC has been extensive in the last 5 years and is currently on-going. Filtrexx International will continue to conduct and support testing and research programs to better inform and assist design professionals in erosion control and storm water pollution prevention plan development. Filtrexx International relies on completed and published research or test results from reputable laboratories and verified via field applied research to generate the performance and design information provided herein. Filtrexx International gives preference to research published in peer-reviewed scientific journals, and secondarily to third party research conducted by universities and federal agencies. For a summary of performance testing and research results on CEBC see Table 8.1. Supporting technical reports and research papers can be found in the Filtrexx Library (www.filtrexx.com/research-library/). Table 8.2 provides performance and design information on other commonly used erosion control practices.

Note: the Contractor is responsible for establishing a working erosion and sediment control system and may, with approval of the Engineer, work outside the minimum construction requirements as needed. Where the CEBC deteriorates or fails, it shall be repaired or replaced with an effective alternative.

**DESIGN CRITERIA**

CEBC is a slope stabilization and vegetation establishment (temporary or permanent) practice used for soil erosion control of disturbed, bare, and erodable soils, on construction and/or land disturbing activities. LockDown Netting can be used to increase the design capacity and performance of CEBC.

**Planning Considerations**

CEBC should be used as one treatment in a treatment train approach to site erosion and sediment control. Runoff control and runoff diversion practices may be designed to help prevent seed washing and soil erosion prior to vegetation establishment and to protect seedlings prior to maturity. Preconstruction meetings should be conducted to educate construction site personnel about the devices/practices used and acceptable traffic patterns that avoid running over CEBC with vehicles and heavy equipment. Vehicular traffic and heavy equipment will reduce the effectiveness of CEBC and contribute to soil compaction, which may increase runoff and erosion and reduce vegetation establishment.

Successful planning for any vegetation establishment project should consider climate, prevailing weather, temperature, sun exposure, available moisture/irrigation requirements, topography, soil type, soil pH, soil amendments, nutrient requirements, drought tolerance, site preparation/coordination with construction phases, time to establishment/coordination with construction phases, protection from erosion and sedimentation, and seed mix/plant selection (Fifield, 2001).

**Temporary vs. Permanent Vegetation**

Temporary vegetation is typically designed for disturbed soils that will undergo future disturbance, such as: cut and fill slopes under construction, soil storage areas and stockpiles, permanent vegetation establishment that requires a nurse crop, stabilization of temporary runoff diversion devices, dikes, and sediment containment systems (Fifield, 2001). Quick establishing annual grasses and legumes are normally specified for these applications.

Permanent vegetation is usually specified for: slopes where erosion control blankets are required, drainage ditches and channels that require liners or turf reinforcement mats, areas that have undergone final clearing and grading and require soil stabilization. Perennial grasses are typically specified and if possible native grasses should be utilized (Fifield, 2001).

Local Landscape Architects, NRCS, or university/cooperative extension should be consulted and used as resources for temporary and/or permanent vegetation seed selection. Many state erosion and sediment control manuals have specifications for seed selection and application rates.

**Preparation and Application**

Where possible, slopes should be vertically tracked to increase soil roughness. This will increase the CEBC contact with the soil, reduce runoff velocity, and increase vegetation establishment success. Reducing runoff velocity can reduce seed wash prior to and during germination and reduce stress on young plants during the establishment phase. CEBC shall be applied to and cover 100% of the exposed or disturbed area where stabilization/vegetation is required. CEBC shall be applied at a depth of 1.5-2 in (35-50mm) or 200-270 cubic yards/ac (385-513 cubic m/ha). Thicker CEBC may reduce runoff during large storm events, which can lead to less soil erosion; however, this is at the discretion of the Engineer. See Installation guidelines in the following section for further details on application and installation specifications of CEBC.

**Establishing & Sustaining Vegetation**

Although CEBC increases water holding capacity and reduce evaporation, irrigation may be required to ensure successful vegetation establishment. Runoff diversion devices may be utilized.
CECB can supply humus, organic matter, beneficial microbes, and slow release organic nutrients that can contribute to better soil quality and plant health. In arid and semi-arid regions, or hot and dry weather, regular irrigation may be required.

Runoff Conditions
CECB should not be used in areas where concentrated flow exists or where runoff velocities will damage or undermine vegetation, unless used in combination with TRMs. For most grasses a maximum velocity of 4 ft/sec (1.2 m/sec) or a maximum hydraulic shear stress of 2 lbs/ft² (10 kg/m²) is recommended (Maryland Storm Water Design Manual, 2000).

Soil Amendment Function
CECB also amends the soil which can provide the following functional benefits: increased soil structure, increased soil aggregates, increased soil aeration, increased infiltration and percolation, increased moisture holding capacity, increased activity of beneficial microbes, increased availability of nutrients, decreased runoff volume and velocity, decreased erosion, and increased plant health and long-term sustainability.

Organic vs. Fertilizer Nutrients
Although most specification and design manuals include fertilizer recommendations or requirements for vegetation establishment, mineral nutrients from fertilizers may not be preferable where vegetation sustainability and water quality are a concern. CECB provides organic nutrients which: are slow release, provide plant micronutrients, and are less likely to be transported in storm runoff to receiving waters – which can reduce pollution and eutrophication of waterways (Faucette et al, 2005). In site sensitive areas where nutrient runoff is a concern, CECB may release up to 1/10 of the nutrient load compared to conventional hydromulching and hydromulching (Faucette et al, 2005).

Weed Establishment
The effects of mulching are known to suppress weed establishment. In addition, invasive weed growth has been more closely associated with mineral fertilizers than organic fertility practices (Faucette et al, 2004).

INSPECTION
Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. If rilling occurs or vegetation does not establish, the area of application should be reseeded with CECB. If failure continues, the use of runoff diversion devices, erosion control support practices, soil stabilizers, turf reinforcement mats, or hard armoring practices should be considered. CECB should be inspected until permanent vegetation is established and land disturbing/construction activities have ceased. Temporary and permanent vegetation practices should always be inspected for noxious or invasive weeds. Any area not covered by vegetation should be reseeded. LockDown Netting should be repaired if it has been moved by wind or storm runoff and/or part or whole is not in contact with the soil surface.

MAINTENANCE
1. The Contractor shall maintain the CECB in a functional condition at all times and it shall be routinely inspected.
2. CECB shall be maintained until a minimum of 70% uniform cover of the applied area has been vegetated or as required by the
jurisdictional agency, and land disturbing/construction activities have ceased.  
3. CECB may need to be irrigated during hot and dry weather, or arid and semi-arid climates to ensure vegetation establishment.  
4. Where CECB fails, rilling occurs, or vegetation does not establish the Contractor will repair or provide an approved and functioning alternative.  
5. If gullies form in CECB, the area shall be re-graded prior to reinstallation of slope protection or alternative.  
6. If a CECB is damaged by storm water runoff, runoff diversion devices installed above the CECB may be required.  
7. If LockDown Netting has been moved by wind or runoff it shall be repaired by restoring contact between soil and CECB interface; additional staples and CECB application may be required.  
8. Once vegetation is established in temporary applications, final seeding and/or permanent vegetation may not be required.  
9. No additional fertilizer or lime is required for vegetation establishment and maintenance.  
10. No disposal is required for this product/practice.  

**METHOD OF MEASUREMENT**  
Bid items shall show measurement as ‘Filtrexx® Compost Erosion Control Blanket [CECB]™ per square ft, per square yd, per square meter, per hectare, or per acre installed. 

Engineer shall notify Filtrexx of location, description, and details of project prior to the bidding process so that Filtrexx can provide design aid and technical support.  

**FIELD APPLICATION PHOTO REFERENCES**  

Compost Erosion Control Blanket.  

Compost Erosion Control Blanket being applied over Lockdown Netting.  

**ADDITIONAL INFORMATION**  
For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at filtrexx.com  

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Call for complete list of international installers and distributors.  

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REFERENCES CITED & ADDITIONAL RESOURCES


### Table 8.1. Filtrexx® Compost Erosion Control Blanket (CECB)™ Performance and Design Specifications.

<table>
<thead>
<tr>
<th>Rainfall Total/Duration</th>
<th>4.4 in (112mm) / 2.4 hr</th>
<th>1.8 in (45mm) min / 35</th>
<th>3.2 in (80mm) / 1 hr</th>
<th>4.0 in (100mm) / 1 hr</th>
<th>4.0 in (100mm) / 1 hr</th>
<th>4.0 in (100mm) / 1 hr</th>
<th>8.0 in (200mm) / 2 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depth of slope protection</strong></td>
<td>3.0 in (75mm)</td>
<td>2.0 in (50mm)</td>
<td>1.5 in (35mm)</td>
<td>1.5 in (35mm)</td>
<td>1.5 in (35mm)</td>
<td>1.5 in (35mm)</td>
<td>2.0 in (50mm)</td>
</tr>
<tr>
<td><strong>Support Practice</strong></td>
<td>w/mulch</td>
<td>fines only</td>
<td>Tackifying agent (w/fines only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Slope</strong></td>
<td>2:1</td>
<td>3:1</td>
<td>10:1</td>
<td>10:1</td>
<td>10:1</td>
<td>10:1</td>
<td>3:1</td>
</tr>
<tr>
<td><strong>Soil Type</strong></td>
<td>Silty sand</td>
<td>clay</td>
<td>Sandy clay loam</td>
<td>Sandy clay loam</td>
<td>Sandy clay loam</td>
<td>Sandy clay loam</td>
<td>Loamy sand</td>
</tr>
<tr>
<td><strong>C Factor</strong></td>
<td>0.02</td>
<td>0.008</td>
<td>0.01</td>
<td>0.01</td>
<td>0.065</td>
<td>0.03</td>
<td>0.0393</td>
</tr>
<tr>
<td><strong>Soil Loss Reduction</strong></td>
<td>98%</td>
<td>99.2%</td>
<td>99%</td>
<td>99%</td>
<td>93.5%</td>
<td>97%</td>
<td>96.1%</td>
</tr>
<tr>
<td><strong>Runoff Volume Reduction</strong></td>
<td>6%4</td>
<td>35%</td>
<td>49%5</td>
<td>23%</td>
<td>52%</td>
<td>52%</td>
<td>ND</td>
</tr>
<tr>
<td><strong>Runoff Rate Reduction</strong></td>
<td>ND</td>
<td>ND</td>
<td>36%</td>
<td>20%</td>
<td>34%</td>
<td>34%</td>
<td>79%</td>
</tr>
<tr>
<td><strong>Test/Research Facility</strong></td>
<td>University of Connecticut</td>
<td>Texas A&amp;M</td>
<td>University of Georgia</td>
<td>University of Georgia</td>
<td>University of Georgia</td>
<td>University of Georgia</td>
<td>Iowa State University</td>
</tr>
</tbody>
</table>

ND: no data reported

1Slope protection in studies that met Filtrexx Specifications.
2C Cover-Mangement Factor: A C Factor of .02 indicates that erosion is reduced to 2% of what would occur under fallow conditions
3Determined from interrill erosion rate.
4Average of 10 runoff events was 76% runoff volume reduction.
5Cumulative over 3 runoff events.
### Table 8.2. Performance and Design Criteria References for Various Erosion Control Technologies.

<table>
<thead>
<tr>
<th>Product/Practice (reference)</th>
<th>C Factor</th>
<th>Influencing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic mulch + synthetic or fiber netting (ECTC, 2004)</td>
<td>&lt;0.10</td>
<td>5:1 slope; ECTC test method</td>
</tr>
<tr>
<td>Netless rolled erosion control blanket (bound by polymers or chemical adhesion) (ECTC, 2004)</td>
<td>&lt;0.10</td>
<td>4:1 slope; ECTC test method</td>
</tr>
<tr>
<td>Single net erosion control blanket (natural materials woven/mechanically bound) (ECTC, 2004)</td>
<td>&lt;0.15</td>
<td>3:1 slope; ECTC test method</td>
</tr>
<tr>
<td>Double net erosion control blanket (natural materials woven/mechanical bound between 2 layers) (ECTC, 2004)</td>
<td>&lt;0.20</td>
<td>2:1 slope; ECTC test method</td>
</tr>
<tr>
<td>Erosion control blanket/open weave textile (slow degrading, continuous weave double net ECB) (ECTC, 2004)</td>
<td>&lt;0.25</td>
<td>1.5:1 slope; ECTC test method</td>
</tr>
<tr>
<td>Turf reinforcement mat (permanent/nondegradable, 3-dimensional thickness, used in concentrated flows) (ECTC, 2004)</td>
<td>None (usually tested for max shear stress or CFS)</td>
<td>0.5:1 slope; ECTC test method</td>
</tr>
<tr>
<td>Straw Blanket (Demars &amp; Long, 1998)</td>
<td>0.08</td>
<td>2:1 slope; natural rainfall (max. 1.6 in [40mm]/24 hr); 10 ft x 35 ft (3m x 10.5m) test plot; on silty sand</td>
</tr>
<tr>
<td>Straw blanket w/PAM (Faucette et al, 2006)</td>
<td>0.19</td>
<td>10:1 slope; 4 in (100mm)/hr 1hr rainfall; 3 ft x 16 ft (1m x 5m) test plot; clay subsoil; 2 in (50mm) blanket</td>
</tr>
<tr>
<td>Mulch Blanket (Demars &amp; Long, 1998)</td>
<td>0.075</td>
<td>2:1 slope; natural rainfall (max. 1.6 in [40mm]/24 hr); 10 ft x 35 ft (3m x 10.5m) test plot; on silty sand; 3 in (75mm) blanket</td>
</tr>
<tr>
<td>Mulch Fines (Faucette et al, 2004)</td>
<td>0.16</td>
<td>10:1 slope; 3.2 in (80mm)/hr 1 hr rainfall; 3 ft x 3 ft (1m x 1m) test plot; clay subsoil; 1.5 in (40mm) blanket</td>
</tr>
<tr>
<td>Mulch Overs (Faucette et al, 2004)</td>
<td>0.11</td>
<td>10:1 slope; 3.2 in (80mm)/hr 1 hr rainfall; 3 ft x 3 ft (1m x 1m) test plot; clay subsoil; 1.5 in (40mm) blanket</td>
</tr>
<tr>
<td>Wood chips @ 7 tons/ac (16 Mg/ha) (GA SWCC, 2000)</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Wood chips @ 12 tons/ac (27 Mg/ha) (GA SWCC, 2000)</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Wood chips @ 25 tons/ac (56 Mg/ha) (GA SWCC, 2000)</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Forest duff layer (GA SWCC, 2000)</td>
<td>0.001-0.0001</td>
<td></td>
</tr>
</tbody>
</table>
**Figure 8.1.** Engineering Design Details for Compost Erosion Control Blanket (CECB)

**NOTES:**
1. CECB to meet Filtrexx® installation specifications.
2. CECB must use Filtrexx® Growing Media®.
3. CECB shall be applied to 100% of bare soil or area specified.
4. CECB shall be installed at least 10 feet over the slope shoulder or into existing vegetation.
5. Erosion control seeding shall meet jurisdictional agency specifications or will be at the discretion of the engineer.
6. CECB shall not be installed in areas of concentrated flow where max. flow exceeds 4 CFS or shear stress exceeds 2 lbs./sq. ft.
7. CECB™ installed on slopes greater than 2:1 shall use additional slope stabilization practices, such as Filtrexx® LockDown™ Netting™ or Filtrexx® tackifying agent.

**Figure 8.2.** Engineering Design Details for LockDown™ Netting.

**NOTES:**
1. LockDown™ Netting to meet Filtrexx® installation specifications.
2. LockDown™ Netting is recommended for slopes between 3:1 and 2:1 and is required for slopes greater than 2:1.
3. LockDown™ Netting is not sufficient to be used alone as a form of slope stabilization or erosion control; LockDown™ Netting shall be installed prior to the application of CECB.
4. LockDown™ Netting shall be anchored to the soil using 8” sod staples to be driven along the entire perimeter of the netting area.
5. Staples for LockDown™ Netting shall be spaced no more than 24” apart on all sides.
6. Where more than one roll of LockDown™ Netting is required for slope length or slope width, netting edges shall be overlapped by a minimum of 6”.
7. LockDown™ Netting shall be installed from top to bottom (never across) on the slope.
8. LockDown™ Netting shall be installed under the entire area of the CECB, including 10 feet over the shoulder of the slope.