

GREENROOF GROWTH (GG) MEDIA SPECIFICATION

1.1. Description

Bold & Gold® Greenroof Pollution Control (GG) Filtration media is a Biosorption Activated Media (BAM) for stormwater treatment in conjunction with other structural or non-structural stormwater BMPs. Bold & Gold® (B&G) Filtration media is a patented product developed at the Stormwater Management Academy of the University of Central Florida.

1.2. Responsibility

The contractor shall be responsible for the satisfactory delivery, stockpiling, installation, and maintenance of the GG filtration media during construction based on information provided in the Contract Documents and as provided by the supplier. The GG filtration media shall be purchased from an approved source.

Contact the local Ferguson Waterworks branch for pricing information. **A Certificate of Authenticity to the Engineer of Record at the completion of the project can be provided. The Certificate of Authenticity includes the quantity of media delivered to the project site and certifies GG delivered meets the patent requirements of the University of Central Florida.**

1.3. Material

Composition: The GG filtration media shall be manufactured with mineral materials and no organic materials. The final product shall conform to the specifications of Table 1: Specifications for Bold and Gold Green-Roof Materials at Multi-Course Extensive Greening Sites.

Percentages shall be determined by in place volume. Water passing through the media must not exhibit acute or chronic toxicity and not change the pH of the filtered water by more than 1.0 unit. The material shall have a water holding capacity of at least 5%, as measured by porosity, and a total porosity of 36%. The permeability as measured in the laboratory must be greater than 65 inches per hour at maximum compaction.

Table 1: Specifications for Bold and Gold Green-Roof Materials at Multi-Course Extensive Greening Sites		
Green-roof Properties for Extensive Greening	Units	B&G Growth Media
<i>Density Measurements</i>		
Bulk Density (dry weight basis)	g/cm ³	0.61
Bulk Density (dry weight basis)	lb./ft ³	38.2
Bulk Density (at max. water holding capacity)	g/cm ³	1.25
Bulk Density (at max. water holding capacity)	lb./ft ³	77.8
<i>Water/Air Measurements</i>		
Air Content	vol. %	20.0
Water Storage capacity	vol. %	64.9
Water permeability (saturated hydraulic conductivity)	mm/min	7.7
Water permeability (saturated hydraulic conductivity)	in/min	0.303
<i>pH and Salt Content</i>		
pH (in CaCl ₂)	pH	7.5
Soluble salt (water, 1:10, m:v)	g (KCL)/L	0.45
<i>Organic Measurements</i>		
Organic matter content	mass %	8.8*
<i>Nutrients</i>		
Phosphorus, P ₂ O ₅ (CAL)	mg/L	29.7
Potassium, K ₂ O (CAL)	mg/L	129.5
Magnesium, Mg (CaCl ₂)	mg/L	61.1
Nitrate + Ammonium (CaCl ₂)	mg/L	11.4
* Includes plant root bulb in the measurement		

Storage and Handling: The GG filtration media is delivered pre-mixed and ready to install. Media shall not be stockpiled longer than 30 days before installation and must be covered to prevent separation of the material due to adverse weather and environmental conditions such as but not limited to rainfall and wind.

1.4. Construction

Delivery of the Material: GG filtration media is delivered to the jobsite pre-mixed and ready for installation. The delivered material is certified to meet the patent requirements and a certificate shall be issued as stated in Section 1.2 of this specification.

Installation: The GG filtration media shall be installed at the depth specified by the design engineer (minimum 2" depth). The surface on which the GG filtration media is placed shall be reasonably smooth and within ± 0.1 of the elevations shown in the plans. Surface on which the GG filtration media is placed shall be reasonably levelled within ± 1 -inch of the elevations shown in the plans. Unless a slope grade is specified in the plans, a level surface is recommended for the subgrade soil to ensure even infiltration of filtered stormwater spread over the entire surface area.

Adjacent Areas: The GG filtration media shall not be installed until all areas that drain to it have temporal/permanent erosion and sedimentation stabilization in place. No runoff shall be directed to the specified location of the GG filtration Media until all drainage area leading to the location are stabilized. If the installed GG filtration media becomes contaminated with sediment, prior to the placement of the cover material, it shall be removed and replaced at the contractor's expense.

Compaction: The GG filtration media shall be placed loosely or compacted to meet the specifications as shown in the plan by the design engineer. Compaction of the GG filtration media shall be achieved by using industry-standard compaction techniques. The GG filtration media may be placed in one lift and compacted to the density specified in the plan by the design engineer. The compacted thickness shall be no less than the thickness shown in the plans. Clean water with no contaminants may be added to the material to meet the compaction requirements. If the compacted GG filtration media has an in-place density greater than 105% of the required density, the material will be reworked to meet density requirements.

1.5. Maintenance

Maintenance requirements for the GG filtration media shall be dependent on the proper functioning and maintenance of all components of the applicable BMP in which the filter media is used. To prevent the clogging of the voids of the GG filtration media, there shall be installed a prefilter prior to the filter media surface for gross pollutant controls.

In the event of the clogging resulting from the reduction of permeability through the prefilter material and the filter media, the sediment-laden cover prefilter shall be removed and replaced with new material meeting the original specifications. Reduction in permeability shall be described as the increase of the drawdown time that exceeds the design duration for the specific BMP application.

GG filtration media is typically designed to last the life span of the applicable BMP. However, maintenance shall be performed if the GG filtration media has shown a reduction in the performance efficiencies on the reduction of Total Phosphorus (TP) below the design value before and/or at the expiration of the design service life. The

maintenance procedure shall involve the removal of the prefilter and GG filtration media and replaced with new material and filter media meeting the original specifications. The spent filter media and cover material shall be disposed of at an approved landfill.

1.6. Applications

GG filtration media is recommended for use in greenroof applications for vegetation growth.

It is not intended for storage in volume attenuation but provides some storage capacity to the limits of the available porosity of 0.25 of the volume occupied by the filter media.

1.7. Design Considerations

The primary control for sizing the GG filtration media is to capture the water quality volume to achieve a specific removal effectiveness and to pass it through the filter media with a specified hydraulic residence time to achieve the target level pollutant mass removal within a specific recovery time.

Surface Area: Surface area is the area through which the water flows. The minimum surface area is dependent on the treatment rate and the volume of runoff to be treated. The volume of runoff to be treated is a function of the rainfall excess at the water quality treatment depth. A factor of safety is applied to the area or to the treatment rate to recognize clogging over a period of time. Most applications required a minimum depth to achieve the removal. Thus, the volume and mass of media is calculated based on the surface area and the depth of the media. If used in a filter that requires complete drainage before the next loading event, a larger surface may be needed than calculated using the treatment rate and volume of runoff.