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GREEN ROOF SUBSTRATE TEST RESULTS

Client: Walbarn
Substrate: Green Roof Modules

October 2020
STRI Research

Materials and Methods

Field site	:	Testing took place in STRI green roof substrate testing laboratory, Bingley (GPS reference 53.8474 and -1.8579).
Timing	:	Testing took place in October 2020

Assessments

All assessments were carried according to current STRI green roof substrate standard testing procedures (BSI 8616). All result values refer only to the substrate sample tested. STRI green roof substrate testing methods (BSI 8616) have been adapted from FLL testing procedures and therefore results are not directly comparable. STRI's laboratory is an official GRO testing house.

Physical Assessments	**Particle Size Distribution**
Bulk Density when oven dried (g cm^{-3})	Stones (>8 mm)
Bulk Density at field capacity (g cm^{-3})	Coarse gravel (8-4 mm)
Calculated bulk density at saturation (g cm^{-3})	Fine gravel (4-2 mm)
Particle Density (g cm^{-3})	Very coarse sand (2-1 mm)
Field Capacity (% v/v)	Coarse sand (1.0-0.5 mm)
Total Porosity (%)	Medium sand (0.5-0.25 mm)
Porosity at Field Capacity (%)	Fine sand (0.250-0.125 mm)
Saturated Hydraulic Conductivity (mm min^{-1})	Very fine sand (0.125-0.050 mm)
	Silt (0.050-0.002 mm)
	Clay (<0.002 mm)
Chemical Assessments	
Organic Matter (%)	
pH	
EC (mS cm^{-1}) Heavy metals (Lead, Copper, zinc, cadmium, nickel) (mg l^{-1})	
Plant available PK (mg l^{-1})	
Total N (%) C:N ratio	

Substrate composition:

Green roof module: LECA 50 %, Green Waste Compost 25 %, Coir 25%

New Mix: Lytag 8-16 mm, LECA 25 %, Green Waste Compost 25 %, Coir 25%

Specification Sheet

Table 1: Physical and selected chemical properties of Walbarn Green Roof Module Substrate. Values refer only to the substrate samples tested.

	Green Roof Module Substrate	New Mix
Substrate Density		
Bulk Density when Oven Dried	0.42 g cm^{-3}	
Bulk Density at Field Capacity	1.01 g cm^{-3}	
Calculated Bulk Density at Saturation	1.04 g cm^{-3}	
Particle Density	1.12 g cm^{-3}	
Water & Air		
Field Capacity	59.4 % v/v	
Total Porosity	62.4 %	
Porosity at Field Capacity	3.0 %	
Saturated Hydraulic Conductivity	20.1 mm min^{-1}	
Chemical		
Organic Matter	11.5 %	10.6 %
pH	7.3	
EC	3.54 mS cm^{-1}	
Plant available phosphate	342 mg l^{-1}	
Plant available potassium	957 mg l^{-1}	
Total nitrogen	1.4 %	
Lead	7.0 mg l^{-1}	
Nickel	1.1 mg l^{-1}	
Copper	6.9 mg l^{-1}	
Cadmium	0.3 mg l^{-1}	
Zinc	28.6 mg l^{-1}	
C:N ratio	4.8	
Particle Size Distribution (% weight)		
Stones (>8 mm)	20.0	
Coarse gravel (8-4 mm)	42.2	
Fine gravel (4-2 mm)	4.2	
Very coarse sand (2-1 mm)	1.9	
Coarse sand (1.0-0.5 mm)	2.3	
Medium sand (0.5-0.25 mm)	4.2	
Fine sand (0.250-0.125 mm)	4.1	
Very fine sand (0.125-0.050 mm)	3.1	
Silt (0.050-0.002 mm)	9.4	
Clay (<0.002 mm)	8.6	

Signed:  **(Study Director)**

Date: October 2020

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