## Results

**Table 1: Physical and selected chemical properties of range of MCM green roof substrate. Values refer only to the substrate samples tested.**

| | GRO 2018 Draft Extensive Green Roof Standards | MCM Extensive Substrate 2 | MCM Extensive Substrate 1 | MCM Semi Intensive |
|---|---|---|---|---|
| Substrate Density | | | | |
| Bulk Density when Oven Dried | NA | 1150 kg $m^{-3}$ | 1370 kg $m^{-3}$ | 1420 kg $m^{-3}$ |
| Calculated Bulk Density at 10% VMC | NA | 1270 kg $m^{-3}$ | 1520 kg $m^{-3}$ | 1610 kg $m^{-3}$ |
| Bulk Density at Field Capacity | NA | 1640 kg $m^{-3}$ | 1780 kg $m^{-3}$ | 1820 kg $m^{-3}$ |
| Calculated Bulk Density at Saturation | NA | 1760 kg $m^{-3}$ | 2040 kg $m^{-3}$ | 2150 kg $m^{-3}$ |
| Particle Density | NA | 2050 kg $m^{-3}$ | 2140 kg $m^{-3}$ | 2090 kg $m^{-3}$ |
| Water & Air | | | | |
| Field Capacity | 22.5-67.5 % v/v | 43.6 % v/v | 37.4 % v/v | 35.05 % v/v |
| Total Porosity | > 22.5 % | 56.0 % | 63.9 % | 68.1 % |
| Porosity at Field Capacity | ≥ 9 % | 50.0 % | 51.0 % | 49.9 % |
| Effective Porosity | NA | 6.0 % | 12.8 % | 18.2 % |
| Saturated Hydraulic Conductivity | 0.6-100 mm $min^{-1}$ | 43 mm $min^{-1}$ | 46 mm $min^{-1}$ | 27 mm $min^{-1}$ |
| Particle Size Distribution | | | | |
| Stones (>8 mm) | NA | 11.0 | 11.8 | 17.0 |
| Coarse gravel (8-4 mm) | NA | 2.7 | 1.7 | 2.4 |
| Fine gravel (4-2 mm) | NA | 3.7 | 2.5 | 3.0 |
| Very coarse sand (2-1 mm) | NA | 12.1 | 8.2 | 10.1 |
| Coarse sand (1.0-0.5 mm) | NA | 19.2 | 17.8 | 18.2 |
| Medium sand (0.5-0.25 mm) | NA | 28.0 | 35.6 | 30.3 |
| Fine sand (0.250-0.125 mm) | NA | 8.0 | 11.0 | 9.1 |
| Very fine sand (0.125-0.050 mm) | NA | 0.6 | 0.9 | 0.7 |
| Silt (0.050-0.002 mm) | NA | 2.7 | 1.6 | 1.2 |
| Clay (<0.002 mm) | NA | 11.9 | 8.9 | 8.0 |
| Particles ≤ 0.0063 mm (% weight) | ≤ 13.5 | 14.6 | 10.5 | 9.2 |
| Particles > 8 mm (% weight) | < 60 | 11.0 | 11.8 | 17.0 |
| Organic matter (by weight) | 2.0-15.0 % | 5.6 % | 2.9 % | 1.6 % |