

## Poster Abstracts

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### Feasibility of waste mussel shells as engineered living roof substrate component



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Living roofs are an increasingly popular strategy to reduce the demand on stormwater drainage networks, and mitigate the harmful effects of urban stormwater contaminants on receiving waterways. In addition to their direct stormwater management benefits, living roofs have the potential to provide a low impact treatment system for stormwater runoff from exposed neighbouring rooftops. The substrate layer of a living roof provides a unique opportunity to reutilise certain waste materials in such a way that supports stormwater management capabilities and may facilitate additional treatment.

This research assesses the feasibility of waste mussel shells, spent coffee grounds, and bark chip (and combinations thereof) as living roof substrate components. Zeolite, vermiculite, and fine pumice are also assessed for their potential enhancement of water storage capacity and cation exchange capacity. The investigation is conducted in three phases: (1) 1L bench-top batch analysis of individual material properties, (2) 1L bench-top batch analysis of combined material properties informed by phase 1 results, (3) flow-through-column analysis with stormwater influent. Key physical and chemical properties, and leachate nutrient levels are assessed in relation to national and international living roof guidelines. Key physical properties include water storage capacity, particle size distribution, dry, bulk, and saturated densities, porosity, and organic matter content. Chemical properties include alkalinity, pH, total dissolved solids, dissolved oxygen, electrical conductivity, and salinity. Results are then compared with top-soil and commercially engineered living roof growing media.

#### Research / Career Interests

- Water quality, ecological engineering, waste stream reuse, living roofs, stormwater management