

On-site topsoil manufacture can significantly reduce landscaping costs



Summary

This Case Study demonstrates the economic and environmental benefits of using PAS 100 green compost for topsoil manufacture on a brownfield site. It outlines the results of a large scale trial conducted at the Wrexham Super Prison construction site.

Key Facts

- Brownfield development sites often have little or no topsoil suitable for use in landscaping.
- The use of PAS 100 compost is commonly accepted as a technique for manufacturing topsoil on-site.
- PAS 100 compost is widely available across the UK.
- Manufactured topsoil frequently outperforms imported topsoil.
- Specific blends tailored to specific end uses can be created across development sites.

What is PAS 100 Compost?

PAS 100 (Publicly Available Specification) compost is manufactured from organic based, biodegradable materials under carefully controlled conditions. Feedstocks for compost are generally derived from parks and gardens such as grass clippings, prunings and trimmings. In addition some production facilities also include a proportion of food waste, collected from householders, in their feedstock mix.

The resulting compost is suitable for a range of uses in agriculture, horticulture and topsoil manufacture.

The PAS 100 accreditation gives reassurance that the material has been processed appropriately and is suitable for the intended use. It is recognised by the regulators as a product so it can be used in projects such as this brownfield redevelopment without the requirement for an environmental permit or exemption.

PAS 100 compost is a good quality, low cost, readily available source of organic matter. It supplies:

- Plant nutrients - Nitrogen, Potassium, Phosphorous and Magnesium.
- Improves the physical structure of soil by adding organic matter.
- Has a liming effect - it raises soil pH.
- Improves drainage on heavy clay soils.
- Reduces compaction on heavy soils.
- Improves water holding capacity on light sandy soils.
- The use of PAS 100 compost also has several key financial benefits on large scale sites.

The amount of compost recommended for use to manufacture soils depends on the properties of the soils already on-site and the soil quality and specification requirement for the finished scheme.

Typical rates of compost addition for on-site soil manufacture are between 10% and 20% by volume. This significantly reduces costs of importation of new soils and often

minimises off site transport and disposal of unsuitable soil stocks.

Wrexham Super Prison

Construction commenced on a new prison, on a former tyre manufacturing site in Wrexham in autumn 2014. The site had limited volumes of suitable soils available for use in the final landscaping scheme. The soils which were present were nutrient poor, clay rich, compacted and had been subject to disturbance from construction plant during site clearance operations.



Planting Scheme

An area of wildflowers was established around the outer perimeter of the site boundary. Between this and the security fence, an area of short mown amenity grass was established and additional perimeter screening of trees and shrubs were planted to soften the visual impact of the new prison development from neighbouring properties. Soil analysis of in-situ material was undertaken prior to the importation of compost to determine application rates and again following compost incorporation to ensure manufactured soil conditions were optimum for the different planting schemes.



Top Soil Manufacture

In order to manufacture topsoil on-site PAS 100 compost was imported from local accredited suppliers and mixed into the on-site substrate at various ratios, calculated from analysis of the on-site soils and the compost supplied. These ratios varied depending on the end use of that particular part of the site.

Depending on the application rate, compost was either blended with stockpiled soils and laid down as one material, or alternatively soils were laid down and compost was spread onto the surface and then incorporated into the laid soil.

Results

Amenity Grass

The use of the compost showed clear improvements in the soil properties and plant growth both from the associated soil analysis and also visually in terms of germination and establishment grass growth, and vigour. Objective assessment demonstrated consistent coverage, germination, colour and growth across the site.

Wildflower Meadow



Wildflowers developed in all areas of the site, which were planted with a meadow seed mix with varying degrees of success in terms of species, richness and diversity. Areas directly sown performed better than hydraseeded areas on steep embankments. All areas at different times of the year showed evidence of well-established wildflowers and ground coverage was complete by the end of the first growing

season. Several of the species included within the seed mix are likely to germinate with a delay of 1-2 years after planting. Thus it is anticipated, that with correct maintenance, the species diversity of the wildflower areas will improve with time.

Trees and Shrubs

Trees and shrubs established well and success rates were high with the exception of Yew which appeared to suffer an almost 100% loss. Yew is intolerant of being replanted and high failures are often found with this species in landscaping schemes. Some species appeared to grow adequately in the compost amended soils and others grew vigorously. No soft growth was evident indicating that fertilisation levels were not excessive and tree health was generally good.



Across all three planting areas the use of compost resulted in establishment and growth which was equal to, or better than, what would be expected if virgin topsoil alone had been used. This is based on previous experience from other projects comparing compost amended soils with virgin soils. Compost amended soils often performs better than non-amended soils.

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