ReCon Soil and DoW CoP Briefing

How the work of ReCon Soil could fit within existing soils reuse guidance in England and Wales.

Context

Soils are a finite natural resource that provide numerous ecosystem services. 'One hectare of topsoil, the most productive soil layer, can contain up to 5 tonnes of living organisms and it can take more than 500 years to form a 2cm thickness' [1]. Despite its value, soil is being degraded at a high rate. This frequently leads to biodiversity loss, flooding and erosion [2].

The carbon storage of soil accounts for approximately 80% of the total carbon in terrestrial ecosystems. Poor soil management, improper storage and unsustainable treatment contributes to an increase in atmospheric carbon and a higher carbon footprint [3].

In the latest data, almost two thirds of waste generated in the UK can be attributed to 'Soils' (~60 million tonnes) and 'Mineral Wastes' (~80 million tonnes) [4]. Disposal of these materials are a costly activity that has historically been standard practice within the construction industry.

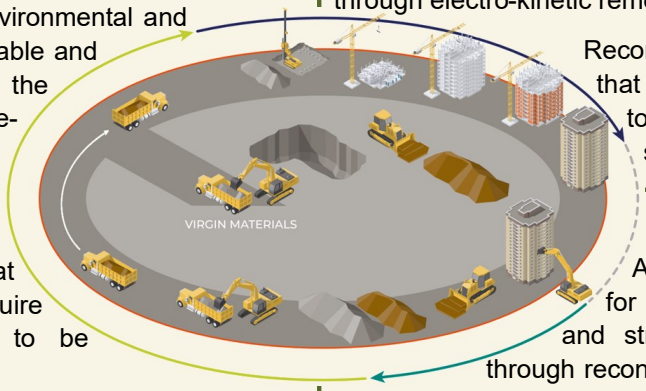
These factors provide a strong environmental and economic case for a more sustainable and cost-effective approach to the conscientious management and re-use of excavated materials.

Research

Soils constructed from waste materials have been demonstrated as capable of supporting plant growth at the Eden Project, Cornwall. A further amendment to the Eden Soil, addition of biochar, was subsequently shown to enhance plant growing conditions by increasing nitrogen and carbon retention; and improving moisture content [5].

A ReCon Soil trial at the Lost Gardens of Heligan, Cornwall, compared a reconstructed soil (composted green waste, bark and sand), alongside double digging, mulch, and control areas. The reconstructed soil had an increased carbon storage potential comparable to double digging, and produced a viable crop in its first season [6].

Similarly, a ReCon Soil study in Normandy, France, found that reconstructed soils using dredged sediment, a nutrient- rich medium, also provided a viable growing medium. This work also found that metal accumulations of copper and zinc in the crop were below safe levels, and could be reduced further through electro-kinetic remediation [7].



Reconstruction of soils, using materials that typically go to waste, has proven to be a viable method for improving soil health and function.

Concept

Excavated soils, particularly at brownfield sites, are likely to require treatment for their true value to be realised.

Currently, through CL:AIRE's Definition of Waste: Code of Practice scheme (DoW CoP), projects in England and Wales remediate soils for re-use by reducing or removing contaminants and improving condition with human health and controlled waters in mind. However, although soils may be further altered for geotechnical suitability, at present little is done to improve the ecological functionality of the soil.

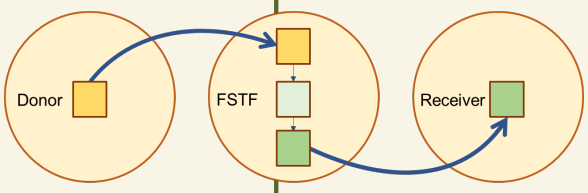
Through its research and engagement, the ReCon Soil project has increased awareness of how waste materials can be used. Combining waste soils and sediments with other readily available component materials can help adapt local soils to better suit their end-use. Amendments to soil can improve ecological functionality; increase carbon sequestration; or increase moisture retention and in doing so can reduce soil displacement and reduce the quantity of soils sent to landfill across industry.

Application

As we build greater appreciation for the value and functions of soils, and strive to maximise their potential through reconstruction, it is important to ensure the work of ReCon Soil has real-world application.

In the UK, handling excess soils means working within the framework of waste and land quality legislation. RPS 190 provides guidance on the use of manufactured topsoil [8]. Alternatively, use of DoW CoP can help navigate the issue.

Fixed Soil Treatment Facilities (FSTF) can accept waste from a variety of producers. Excavated wastes are taken to a FSTF, accompanied with relevant site data, and deposited as waste. These facilities are able to remediate the soils and store them in identifiable parcels. Once a suitable end user is established, and criteria set out within the DoW CoP are met, the FSTF can arrange transfer to the receiver site.



This established mechanism provides a potential methodology and venue for soil reconstruction as envisaged through ReCon Soil. For further detail, please refer to the full DoW CoP document [8].

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