



## **Smarcraft® : Carbon Comparison with Traditional Method**

Smarcraft® is an off-site prefabricated, modular concrete foundation to allow for a safe, quick, efficient VRS barrier installation.

The product offers significant efficiencies regarding installation resourcing, time, safety and quality. This paper summarises the performance of Smarcraft® compared to traditional VRS foundation methodology, in terms of **carbon emissions** for each scenario.

This comparison is based on modelling for the production and installation stages of each product (lifecycle stages A1 – A5), delivered using industry software package “One-Click LCA”.

This software adopts a lifecycle assessment approach in line with BS EN 15804+A2 and draws from the EcoInvent data library of verified lifecycle impact data for all materials and activities.

Note that this comparison is self-declared and is not an independently verified EPD.

Scenarios for comparison:

1. Traditional Trench foundations for VRS (1000mm (W) x 200mm (D), consisting of site-poured concrete and steel rebar reinforcement, with surface mounted steel posts.
2. SmartRaft system, comprising off-site manufactured concrete raft with steel and basalt rebar reinforcement, with SmartRaft posts, pins and sockets

### **Key Conclusions:**

The Smarcraft® system offers substantial carbon savings compared to the traditional scenario.

Smarcraft® delivers **22% less carbon emissions from product manufacturing**, including raw materials, transport and production process. This is a factor of the reduced materials mass required for off-site production of the SmartRaft under factory conditions, compared to the site-poured scenario where materials wastage from off-cuts / surplus material and from less reliable conditions on site are more common.

Smarcraft® offers around a **50% saving in carbon emissions from construction installation**. This is largely a factor of the timescale improvements of using the SmartRaft product (typically 1/7 of the time compared to traditional install) with the associated reductions in transport of plant, labour and deliveries to site, and usage of plant. The Smarcraft product also eliminates the need for waste removal from site as the product comes ready to install.

Taken together, **Smarcraft® delivers a 33% saving in carbon emissions over the product manufacturing and construction installation stages.**



Assumptions made :

- Raw materials wastage assumed for site-poured traditional scenario, as 10% for concrete and 5% for rebar / steel posts etc
- Assumed supplier transport distances for concrete, steel rebar and galvanised teel posts / pins etc are the same for each scenario
- As per figures provided, for a 60m install, transport during construction is taken as:
  - site vehicle travel (transit van) @ 1 x 50km journey per day, for 1 day (Smarcraft®) versus 7 days (traditional)
  - 18t beavertail lorry @ 1 x 50km journey per day, for 1 day (SmartRaft) versus 3 days (traditional)
  - 3.5t excavator used for 3 days (traditional only)
  - post-install visit to site (transit van) @ 1 x 50km journey (SmartRaft) versus 2 x 50km journey (traditional)
- Use of concrete shuttering, mould oil and water for damping down / washout are taken to be the same for each scenario