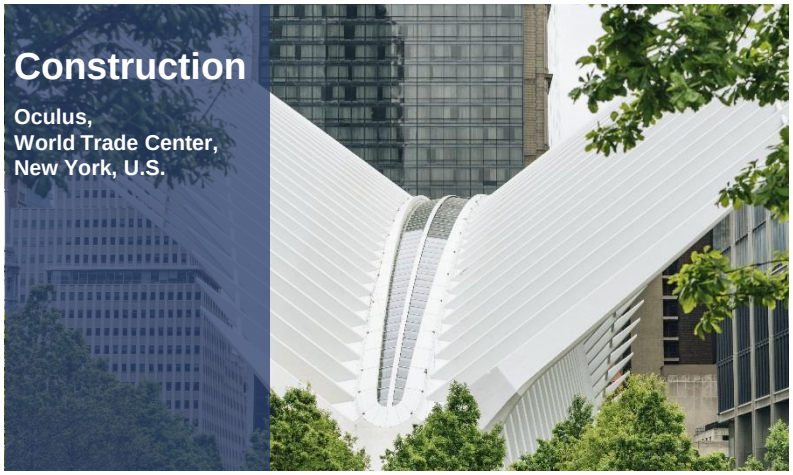
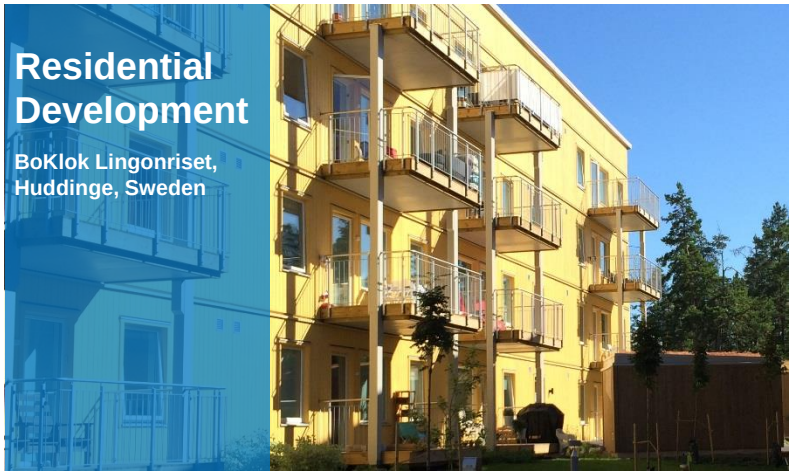
Lean and Sustainability

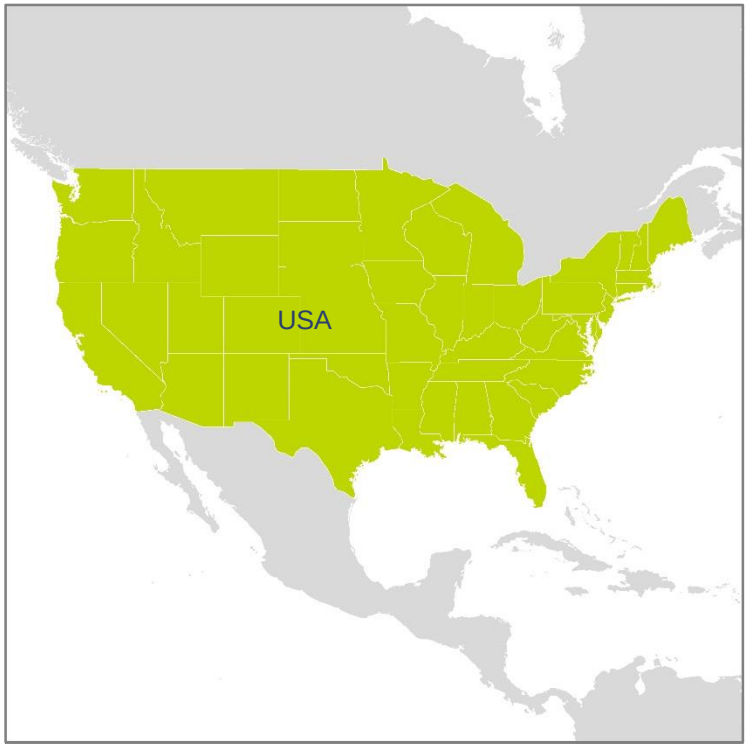
Anna Åkesson, Senior Environmental Manager Skanska AB

Global business streams





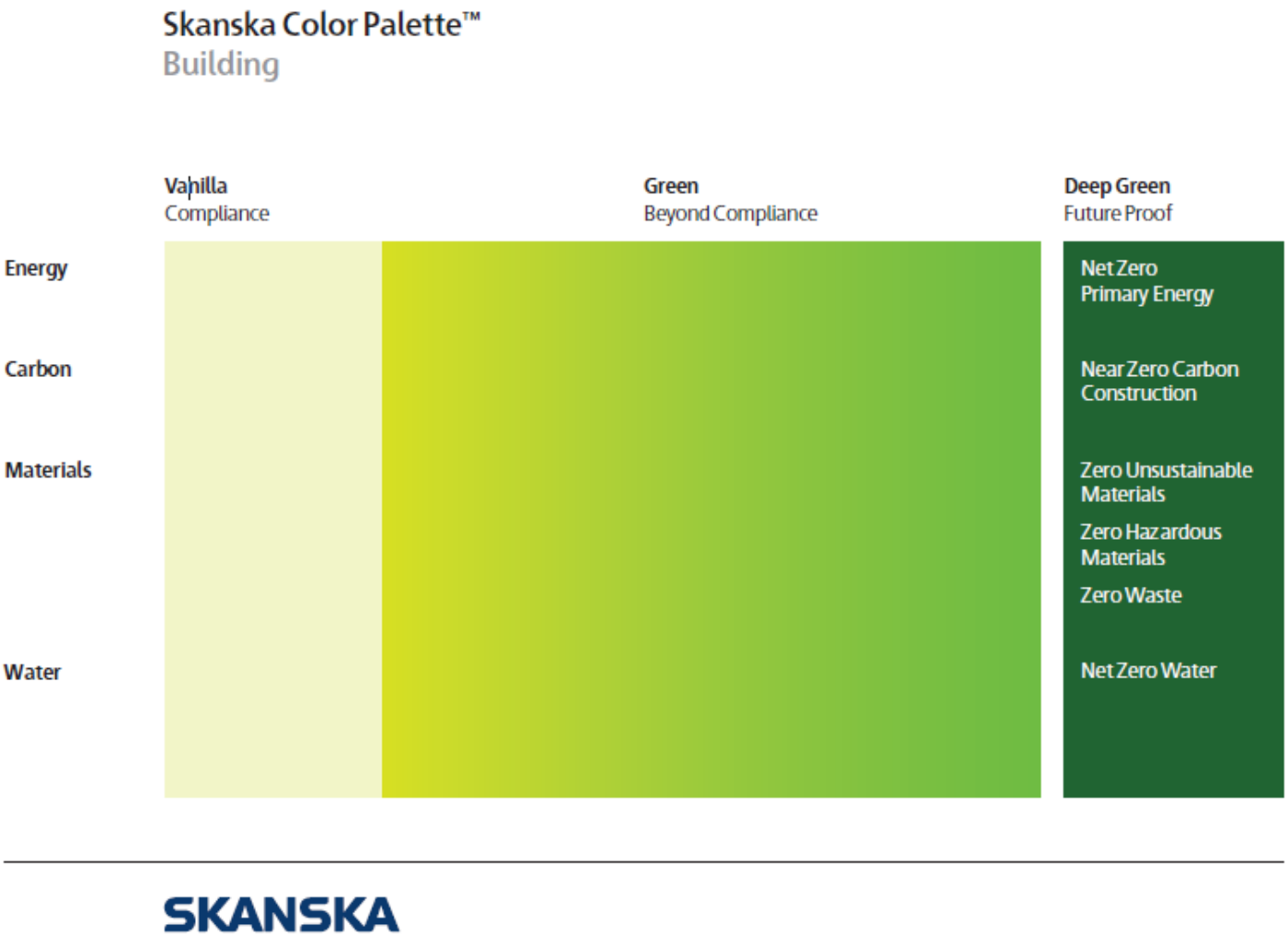
We are active in selected home markets



Skanska Values

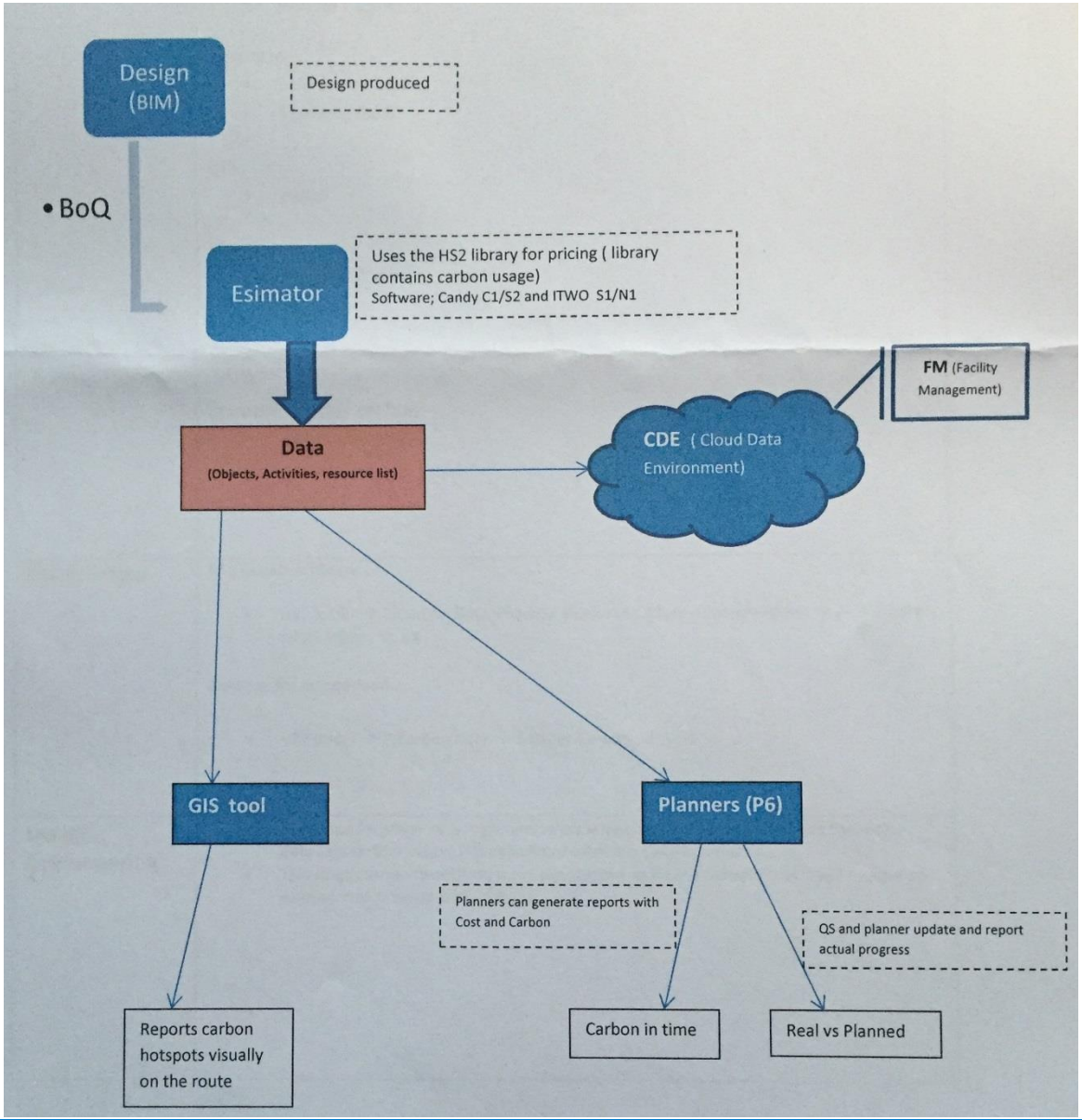
Lean and Sustainability in Skanska

Color Palette



$\sum \$$

$\sum CO_2$


Design (BIM)
Design produced
• BoQ
Esimator
Uses the HS2 library for pricing (library contains carbon usage)
Software; Candy C1/S2 and ITWO S1/N1
FM (Facility Management)
Data
(Objects, Activities, resource list)
CDE (Cloud Data Environment)
GIS tool
Planners (P6)
Planners can generate reports with Cost and Carbon
QS and planner update and report actual progress
Reports carbon hotspots visually on the route
Carbon in time
Real vs Planned

Anglian Water - UK

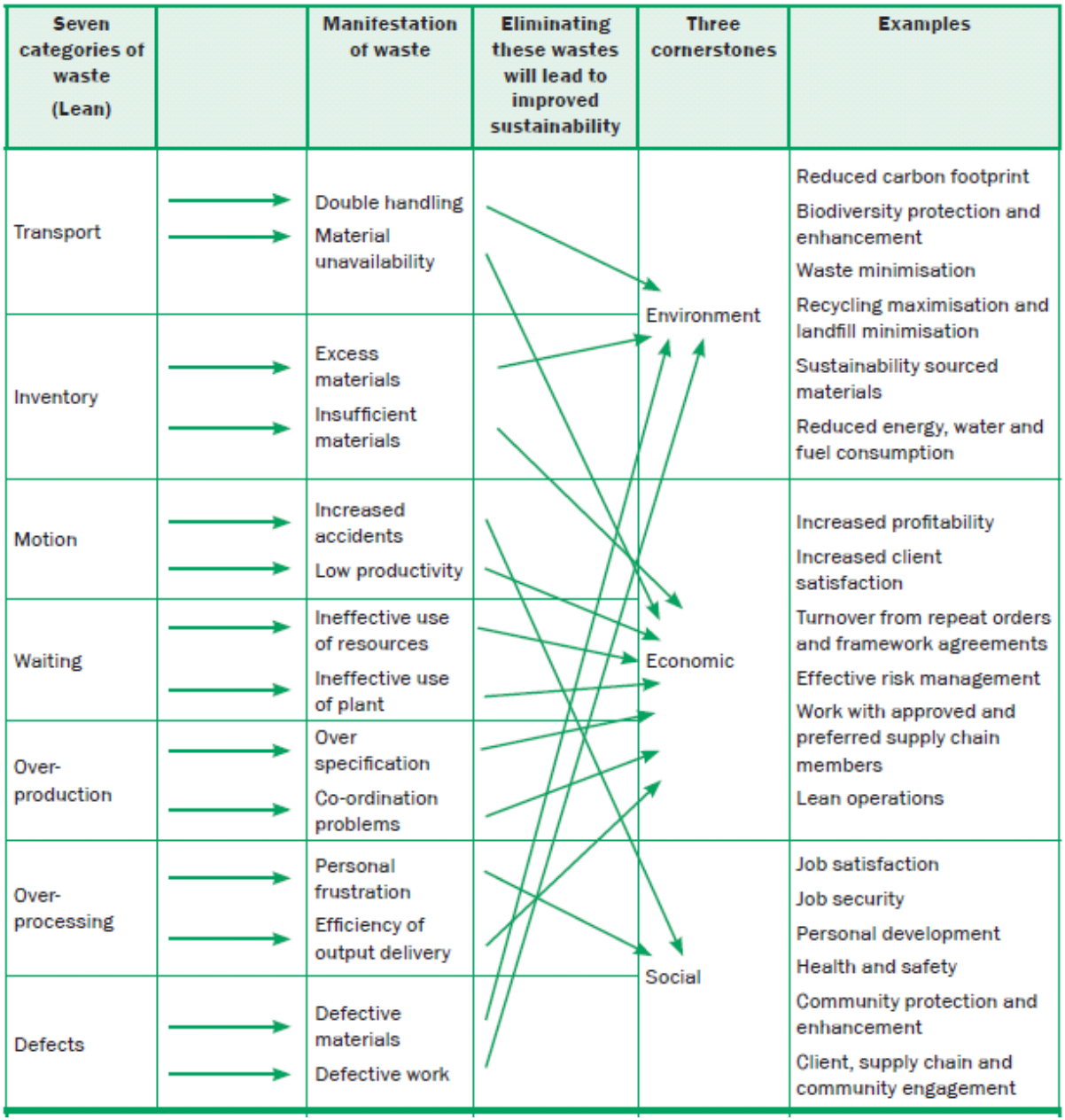
The @one alliance

The @one Alliance is a collaborative organisation comprising client, design consultants and contractors, formed to deliver a large part of the Anglian Water AMP4 & AMP5 capital investment programme

SKANSKA

Lean and Sustainability

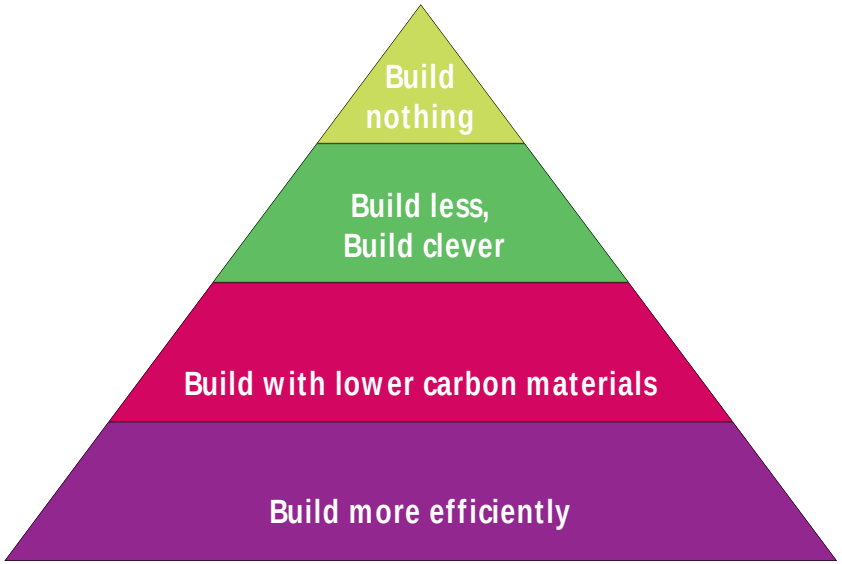
To inspire joined up thinking, we illustrate the link between **lean construction** and **sustainability**.



The links between Lean construction and sustainability (adapted from Shepherd Construction)

Sustainability hierarchy

Our design engineers use a four-stage process to remove embodied carbon and waste at the project planning stage.



Product-based delivery – Standard Products

A product is a standard unit of asset delivery which delivers more value the more times it is used

- initiative developed to drive efficiencies within our delivery programme
- move away from bespoke designs to standard modular solutions
- through the use of Standard Products we reduce redesign, rework and waste…
- which in turn minimises design time, project expenditure and construction programme

> design the product once
> get it right
> use it many times…

Product-based delivery – Standard Products & Build Offsite

Wastewater UV channels

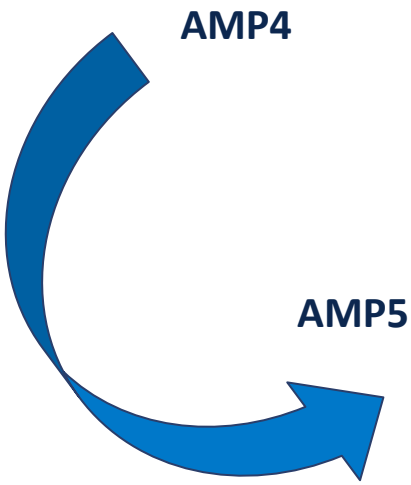
- Traditionally concrete channels constructed on site
- Worked with suppliers to develop an offsite modular UV channel
- Full testing in the factory – plug and play
- Reduced construction time from 16 to 8 weeks

Product has enabled **56%** cost saving across 5 projects
52% saving on embodied carbon and significantly reduced waste

Product-based delivery – Standard Products & Build Offsite

Chlorination Standard Product

- New Standard Product manufactured and tested off-site reducing on-site construction activities
- Assured visual appearance and right first time build quality
- Large reduction in material waste and embodied carbon
- Health and safety risks reduced due to less work on site
- Savings currently being quantified but expected to be greater than 20%



Curved trenches

We designed an excavator bucket to produce a trench matching the shape of the pipe.

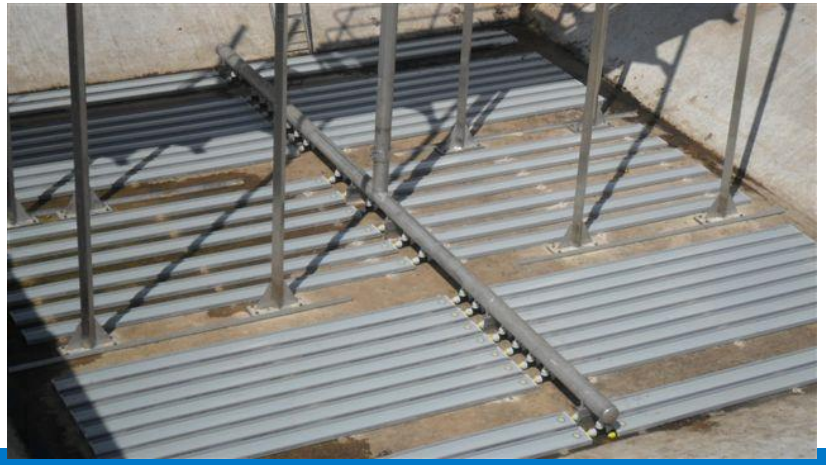
This reduces the project cost and the embodied carbon by reducing the amount of surplus material taken offsite and the volume of backfill material required.

Maximising existing assets

The solution that has been developed in collaboration with Operations and the Supply Chain provides the additional capacity by using Integrated Fixed Film Activated Sludge (IFAS) technology to maximise the potential of existing assets.

Benefits

- CAPEX saving - £8,000k
- Emb. carbon saving - 3200 TCO2e
- Op. carbon saving - 2500 TCO2e



anglianwater

M25 - UK

Recycled Aggregates

Recycled Content

- 2.2 million tonnes of recycled / secondary materials will be used in the works
- 100,000 tonnes of glass sand used to date
- Produced from waste materials
- By-product of sorting mixed recyclables at Viridor's MRF in Crayford
- Difficult product for Viridor to get back into market for glass production due to colour mix and quality
- Approx **35,000Te CO_2e** saving taking account of all recycled content

Sheetpile Walls

Procurement

- Steel manufactured from 100% scrap steel using electric arc furnace, production uses 5GJ/tonne vs 20GJ/tonne using blast furnace
- Manufactured in Luxembourg. Alternative is Japan / China
- Transport to site by rail, sea and road

Design

- King pile system combined with AZ profile reduces tonnage of steel required by approx 25%
- 32,000 tonnes of steel using this method and procurement route gives a saving of **61,759Te CO_2e** over the alternative
- 2.8km of sheet piles designed out and regraded in section 1 saving 2,484t of sheet piles and **4,397 Te CO2e**

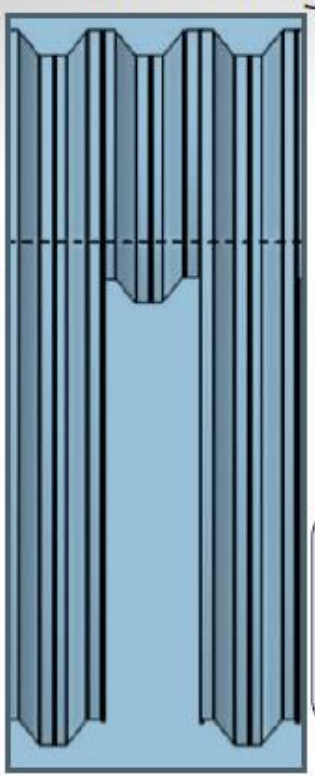
M25 King Sheet Pile System

Faster Delivery

Lower Emissions

Lower Cost

Safer Solution



- Faster installation
- 30% less steel
- Lower Emissions
- Lower Cost

"Extensive use of the proprietary King Sheet Pile profile, with long piles interspersed with shorter intermediate piles, reduced associated capital carbon by over 80 per cent"

Infrastructure Carbon Review

Thank You!

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