Towards Zero Loss Sustainability in Construction

CSIC Cambridge Centre for
Smart Infrastructure & Construction

In 2019 the UK government committed to bring all **greenhouse gas** emissions **to net zero by 2050**.

The **construction industry** is one of the **most polluting** industries. For example, **60 million tons** go directly to **landfill** simply due to **overordering**, **mis ordering** or **poor handling** .

The **main aim** of this project is to implement **Lean production principles** such as **zero loss yield analysis (ZYLA)** to improve construction through focusing on **value** and **waste elimination.**
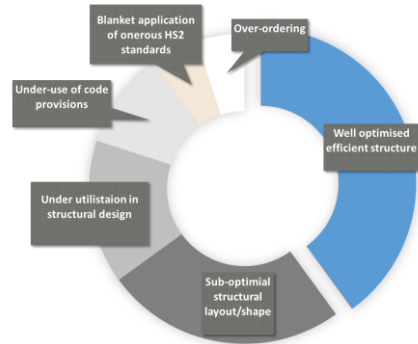

Figure 1 Sub optimal use of material in structural elements. Source: Expedition Engineering (Jan 2021)

The goals of the ZLYA in this project are to:

- Establish a picture of **material consumption**, **losses** and **waste** in the value chain.

- Establish which areas of the **value chain** will **yield greatest return** on **time** and **effort** invested to deliver **material savings.**

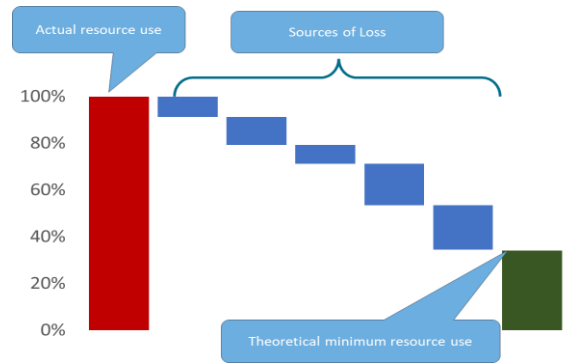- Determine **focus areas** for task forces to deliver **material savings.**

Figure 2 Water fall diagram representing inefficient use of materials

This project is part of the **High speed Two (HS2)** Tiger Team (TT) Project at **Expedition Engineering.** Focusing on delivering **scale benefits** to **HS2** and the **wider infrastructure sector.**

The challenge addressed in this project is how **innovation** can enable **improvements in productivity and reductions in cost and carbon.**

Multiple areas have been investigated including **design, manufacture, and construction** in which significant **savings** could be made.
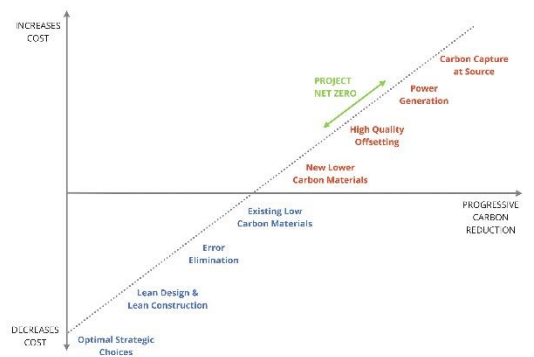

Figure 3 Minimum cost to net zeros Source: Expedition Engineering (Jan 2021)

Dr.Omar Abo Madayn   **osd22@cam.ac.uk**

@CSIC-IKC   www.smartinfrastructure.eng.cam.ac.uk

UNIVERSITY OF CAMBRIDGE   UKRI Innovate UK   UKRI Engineering and Physical Sciences Research Council   expedition