



CASE STUDY

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SUSTAINABILITY IN CONSTRUCTION

As of 2019, 38% of the world's carbon emissions output came from the construction industry.

Obtaining contracts and construction bids are becoming increasingly concerned with sustainability and actively promoting this throughout their supply chain. From contractors used to the principles of reducing, reusing and recycling resources. Making educated changes like these can have a positive and meaningful impact on the world's carbon footprint.



THE CASE STUDY: LOWPRO 23/05 vs STEEL ROAD PLATES

We conducted a study that compared the total carbon footprint over the life of Oxford Plastics' LowPro 23/05 Composite Road Plate, compared to the equivalent Steel Road Plate as determined by the HAUC Advice Note 2018/01.

The equipment used was the LowPro 23/05 which is a modular product made up of 2.3mm x 0.5mm load bearing sections, with each piece weighing 65kg. The equivalent steel road plate used, according to HAUC guidance, is 1.25m x 2.4m, 27mm thick weighing 635kg. The carbon emissions factors were sourced from the 'Greenhouse Gas Emissions Calculation Tool' published by the Greenhouse Gas Protocol6, and 'ICE (Inventory of Carbon and Energy)' (V3.0 – 10 November 2019).

The example we've used for our case study is where the road plate covers the entire span of the road, which is 6m wide. To cover the span of the road 12 LowPro 23/05 road plates are needed. To cover the same area 5 steel road plates are needed. Road plates are used on jobs for anywhere from a few hours to several weeks. For the study, we estimated that a set of road plates would be used on 20 jobs per year. The lifecycle of a composite road plate can be many years with proper use. Feedback from our customers show that steel road plates for hire can be in use for around 7 years typically. Therefore, we have selected 7 years as the lifecycle duration for this case study.

As digs are carried out across the country, with local hubs, distribution centres and depots typically within a few miles of the site. We approximated that the work site is 30 miles away from where the road plate is stored. Transit had been calculated at 60 miles per job, to account for the equipment being transported to and from the work site. The typical vehicle that transports 12 LowPro 23/05 Road Plates, which in total weighs 780kg, is a 3.5t van. The typical vehicle that transports 5 steel road plates, which in total weighs 3175kg, is an 18t rigid HGV.



LOWPRO 23/05 ROAD PLATES

The LowPro 23/05 Road Plates are manually installed. They can be transported to the site and stored in the bespoke steel stillage which holds 14 pieces of road plate. In this instance, the full stillage must be manoeuvred by a forklift. The LowPro 23/05 can be installed by hand which creates maximum carbon efficiency. In this case study, we assumed that the LowPro 23/05 road plate is moved by hand.

LowPro 23/05 Road Plates cannot be recycled, they are either burnt to create Energy from Waste (EFW) or sent to a landfill. For the purpose of this study, we assumed that most LowPro 23/05 are sent to an energy from waste facility. The installation carbon footprint is calculated as 0 for LowPro 23/05 Road Plates, as no heavy lifting equipment is required for a manual installation.

STEEL ROAD PLATES

A single steel road plate weighs 635kg, and so this must be moved by an HGV fitted with a crane. It is estimated by our customers that 10 litres of diesel is used over 2 hours to install and dismantle the set of steel road plates. The steel road plate installation is calculated by multiplying the emission factor of a heavy-duty vehicle with the amount of diesel consumed over the lifetime of installations. Where all LowPro 23/05 Road Plates go to energy from waste, and the majority of steel road plates are recycled with a further 15% going to landfills. It is estimated by Worldsteel LCI reports that 85% of steel is recycled at end of life.

CONCLUSION

The overall carbon footprint of the lightweight, manually handled, composite LowPro 23/05 Road Plate is 21% of the steel road plate alternative. This signifies a 79% reduction in carbon emissions throughout the supply chain. The study showed that a set of LowPro 23/05 Road Plates have a significantly lower carbon footprint compared to a set of steel road plates. Over the lifetime of a set of LowPro 23/05 Road Plates, a huge saving of 79% of carbon emissions can accumulate – representing a large potential saving for supply chains in the construction industry if used.

IMPACT ON SUPPLY CHAIN

By using the set of LowPro 23/05 Road Plate instead of the set of steel road plates, there is 79% reduction in carbon dioxide emissions. This includes;

- ▶ **69% less carbon footprint during the manufacture stage**
- ▶ **76% less carbon footprint in transit**
- ▶ **0kg CO₂e carbon footprint during installation**

This directly impacts the carbon footprint of the business, contractor, and customer where trench work is needed – reducing carbon emissions through the supply chain. In a single case of choosing the LowPro 23/05 instead of the steel road plates, the supply chain eliminates 16 tonnes of carbon dioxide equivalent emissions. For a typical hire business in the UK with 1000 steel road plates within its fleet, using a lightweight road plate can save 1600 tonnes of CO₂e over the lifetime of the products.

Here at Oxford Plastics, we are dedicated to sustainability. Read more about our commitment to sustainability and our top sustainability tips here.

Alternatively, follow our sustainability guide or get in touch today if you'd like to talk to one of our friendly and knowledgeable team.

