

Case study

# M20 Junction 5

## Delivering Significant CO2 Savings with Low-carbon Steel

Hill & Smith VRS partnered with the Littlewood Group to deliver a permanent steel vehicle restraint system (VRS) for the M20 Junction 5 improvement scheme in Kent.

With sustainability high on the agenda, the client sought innovative approaches to reduce embodied carbon across the project. Hill & Smith VRS responded by manufacturing and supplying barrier components using low-carbon steel, marking a first for the business and setting a benchmark for future schemes.

Products installed:

- N2W2 Permanent Steel VRS
- H2W2 Permanent Steel VRS.



## The challenge

This high-profile infrastructure project came with clear sustainability objectives. National Highways' brief focused on reducing the carbon footprint associated with materials supply and construction. Specific challenges included:

- Sourcing alternative materials without compromising on performance or compliance
- Maintaining manufacturing quality and durability with unfamiliar feedstock
- Aligning the supply schedule with site logistics while introducing a new product
- Demonstrating measurable environmental benefits to stakeholders

## The solution

Hill & Smith VRS approached the challenge with a clear focus: reduce carbon without compromising on quality, safety, or programme. This meant rethinking materials, refining processes, and working closely with delivery partners to ensure the new approach worked smoothly on site.

### Low-Carbon Steel, Proven Performance

Around 50% of the VRS components were manufactured from bluemint® recycled steel, supplied by thyssenkrupp Materials UK – directly from thyssenkrupp Steel Europe's steel mill in Duisburg, Germany. bluemint® recycled steel offers a 64% reduction in CO<sub>2</sub> compared to traditional blast furnace manufactured steel – a process which is achieved by using a high-quality scrap product in the blast furnace significantly cleaner than traditional blast furnace production. Crucially, this carbon-reduced steel met the same exacting standards as conventional alternatives. All fabrication and galvanisation was carried out in-house at Hill & Smith VRS's West Midlands facility, which is powered entirely by renewable energy, ensuring carbon savings across the full production cycle.

### Seamless Supply, Same Standards

This was the company's first live scheme using low-carbon steel, but thanks to rigorous internal planning and quality control, it slotted into the supply chain without disruption. The components were manufactured using standard processes, hot-dip galvanised for long-term durability, and delivered in line with the programme – proving the approach is not only viable but scalable.

### Collaborative Delivery from Day One

Success hinged on early engagement and collaboration through Early Contractor Involvement (ECI) to scheme delivery in order to achieve the successful carbon savings. Hill & Smith VRS worked in close partnership with Littlewood Group and thyssenkrupp Materials UK from the outset. This enabled the team to anticipate and mitigate potential risks, communicate clearly, and maintain transparency around the sustainability targets throughout. Internally, project controls ensured traceability and progress monitoring at every stage.



## Outcome and Results

The M20 Junction 5 scheme delivered a tangible demonstration of how sustainability and infrastructure safety can work hand in hand. By introducing low-carbon steel without altering the system's form, function, or installation methods, Hill & Smith VRS proved that environmental benefits don't have to come at the expense of performance or programme.

The project resulted in a verified carbon saving of 30,785 kg of CO<sub>2</sub>, equating to:

- The annual electricity use of six UK homes
- The carbon absorption of 509 trees over 10 years
- Taking seven petrol cars or 27 EVs off the road for a full year
- Preventing the burning of over 34,000 pounds of coal

These outcomes represent more than impressive statistics – they reflect a scalable approach to carbon reduction within core infrastructure. Crucially, the switch to low-carbon steel did not require any changes to installation practice, proving the solution can be readily deployed on future schemes.

For Hill & Smith VRS, the project set a powerful precedent. It validated the organisation's internal processes for sustainable manufacturing and supply, confirmed the integrity of carbon-reduced steel in critical safety applications, and reinforced the value of early, open collaboration with supply chain partners.





*“We are proud to have collaborated with our customers and wider stakeholders on the M20 Junction 5 project. It was an opportunity for Hill & Smith VRS to explore all low carbon options and integrate these materials to our manufacturing cycle.*

*Delivering quality and compliant products to the UK highways market remains our absolute priority. We are even more excited to work with low-carbon materials to further support our industry in achieving our nationwide green targets and support all our stakeholders who are on this journey with us.”*

**Alice Kennedy, Head of Sales, Hill & Smith VRS**

## Find out more

For more information on Vehicle Restraint Systems (VRS) and Parapet Solutions, contact [info@hill-smith.co.uk](mailto:info@hill-smith.co.uk)

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