Case study

A34 Three Maids & A379 Exeter Bypass

Extending the Life of Vital Bridge Structures

Products installed:

- Rebloc RB185A H4a W1 Barrier

National Highways identified ageing footbridge structures along the A34 Three Maids Hill and the Devon County Council (DCC)-managed A379 Exeter Bypass as critical risks, vulnerable to vehicle impacts that could severely compromise structural integrity and public safety. To mitigate these risks cost-effectively and avoid premature bridge replacements, Hill & Smith Infrastructure partnered with HW Martin (Safety Fencing) Ltd to deliver very high containment vehicle restraint barriers. The project deployed the robust Rebloc RB185A H4a W1 precast concrete barrier system, tailored to the unique challenges of each site, and marked a significant step in safeguarding vital infrastructure assets while optimising long-term value for the client.

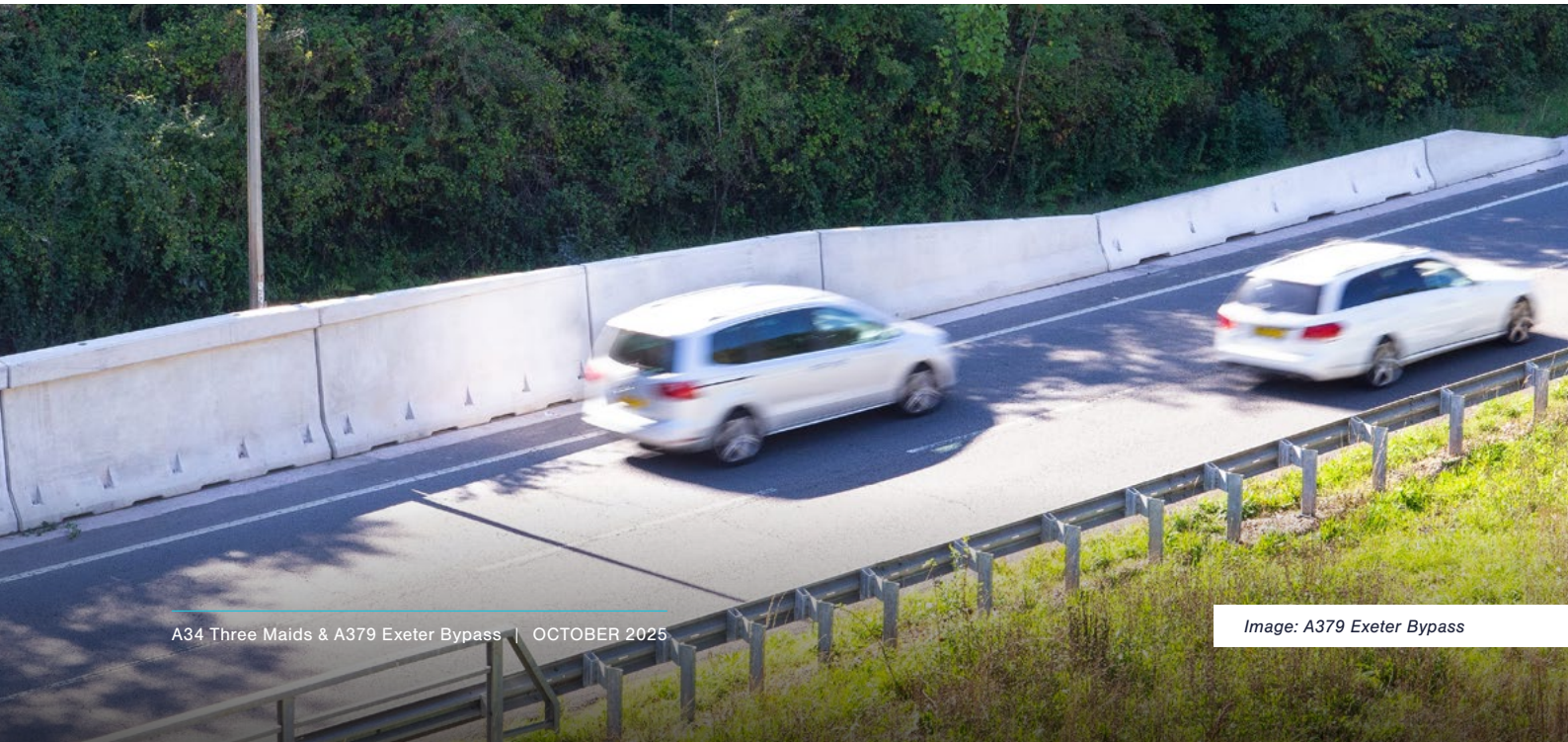

Image: A379 Exeter Bypass

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The challenge

Delivering robust protection for ageing bridge structures on two separate schemes was no small feat. Both the A34 Three Maids Hill and the A379 Exeter Bypass projects presented a unique blend of technical, environmental, and logistical hurdles. Success depended not only on innovative products but also on close collaboration and the ability to adapt rapidly to changing circumstances. Among the key challenges faced were:

Product Selection

The risk assessment identified the need for a very high containment system (H4a performance) which was capable of being installed within a confined environment using the existing infrastructure. To meet the constraints of the site, the chosen barrier needed to deliver a low working width and minimal vehicle intrusion. In addition, the barrier was required to incorporate approved, compatible end terminals to ensure a safe and seamless approach and departure for road users.

Customer Impact

Minimising disruption to road users was a critical priority throughout the project. This required very early engagement and meticulous design and planning to identify and manage the construction risks well in advance. The works were delivered under stringent night-time working restrictions, leaving narrow windows for installation. National Highways and Local Authority imposed tight deadlines to avoid clashes with subsequent schemes – particularly the M3 Junction 9 upgrade – and to maintain critical diversion routes. These pressures required precise coordination, with each shift carefully planned to avoid any programme overruns and ensure the motorway could reopen safely to traffic by early morning each day.

Weather-related Risks

Given the time of year, adverse weather posed a risk to the construction programme – particularly for operations. To mitigate this, a precast barrier solution was chosen to reduce the likelihood of weather-related delays. REBLOC precast barriers are manufactured off-site in a controlled environment, ensuring consistent quality and enabling the system to be delivered to site as a ready to install kit of parts. This approach significantly reduced onsite activity and allowed installation to proceed efficiently, regardless of cold temperatures or wet conditions.

The solution

Hill & Smith Infrastructure worked closely with HW Martin and design partners to deliver a tailored, collaborative solution for both schemes. Our technical expertise, innovative products, and agile problem-solving ensured the complex engineering and site constraints did not affect successful project delivery.

Innovative Products

At the heart of the solution was the Rebloc RB185A H4a W1 high containment barrier, engineered for

demanding bridge protection applications. This precast system offers robust impact resistance, integrated steel reinforcement bars, and the ability to achieve H4a containment levels, making it ideal where errant vehicles could endanger bridge structures.

Unlike slipform methods, RB185 was manufactured off-site, arriving at full strength and eliminating the risk of weather-related delays. Its innovative design also allowed for direct integration with steel VRS without requiring transitional units, saving time and cost. This connection was used for the first time in National Highways Area 3, making these projects among the first pioneers of the technique.

Robust Engineering Solutions

Both projects presented unique geotechnical challenges. At the A34 site, tightly compacted chalk created excavation difficulties, increasing the risk of delays and costly rework. Hill & Smith Infrastructure worked closely with WSP and HW Martin to redesign the RB185 foundations, adjusting depth and width to suit the ground conditions while preserving the barrier's structural integrity.

Similarly, the A379 site featured sand rock that limited foundation size. Here too, proactive engineering solved the issue, ensuring the barriers could be safely and effectively installed despite the constraints. These tailored solutions were crucial in delivering the projects within the tight programme.

Precision Installation and Programme Acceleration

Once foundations were ready, the installation of the RB185 barriers was fast and efficient. Crews likened the process to "Lego blocks," describing how barriers were craned into place with minimal manual handling, dramatically speeding up progress.

During night-time working, deliveries were precisely coordinated, with wagons, forklifts, and lifting gear arriving exactly when needed. Even challenges such as bends, cambers, and uphill sections were managed smoothly, thanks to the detailed design that was completed prior to installation. This seamless delivery ensured that the projects stayed on schedule and avoided extended traffic management requirements.

Proactive Collaboration and Knowledge Transfer

Early engagement and strong collaboration were key to this success. Hill & Smith Infrastructure's technical team worked closely with HW Martin, WSP, and National Highways from the outset. Site visits, collaborative problem-solving, and ongoing technical support boosted confidence across all parties.

Lessons learned from A34 Three Maids Hill were rapidly applied to the A379 Exeter Bypass, helping to streamline planning and avoid earlier challenges. The same installation team was closely involved across both schemes, enabling smoother execution, faster installation, and more confident decision-making on site. This commitment to proactive knowledge sharing reduced risk and created efficiencies that benefitted both projects.

The outcome

Both the A34 and A379 schemes were completed successfully, achieving all programme and performance targets:

Swift Programme Delivery

Despite tight night-time working windows and demanding schedules, both installations were completed within two night shifts each. This ensured that critical diversion routes remained available and

Image: A379 Exeter Bypass

prevented potential conflicts with subsequent works, including the planned M3 Junction 9 upgrade nearby. This achievement also minimised disruption to road users and maintained network resilience during a period of significant infrastructure upgrades.

Reduced Risk and Cost

One of the many benefits of the RB185A's modular, precast design is that it significantly reduced the risk of weather-related delays, avoiding the additional costs and resource implications typically associated with on-site construction activity. Because the barriers arrived on-site already cured and at full strength, the teams were able to maintain momentum even during periods of freezing temperatures that would have halted traditional concrete works. This reliability not only protected the programme but helped optimise resource utilisation and reduce overhead costs related to prolonged site occupation and traffic management.

Enhanced Bridge Asset Protection

Installing very high containment barriers like the RB185A provided National Highways and DCC with a practical solution to extend the operational life of ageing bridge structures. By protecting vulnerable footbridges from the potentially catastrophic impact of errant vehicles, these installations reduce the need for expensive structural replacements and the significant disruption such works would entail. The barriers' robust containment capabilities effectively "future-proof" these assets, allowing National Highways to prioritise investment where it's most urgently needed across the network.

Operational Excellence

The seamless execution of both schemes demonstrated Hill & Smith Infrastructure's capability to deliver complex installations with exceptional efficiency and precision. Site teams praised how the RB185 barriers could be rapidly installed, describing an installation process that was quick, smooth, and highly coordinated. The careful sequencing of deliveries – ensuring materials, forklifts, and lifting equipment arrived exactly when needed – contributed to the streamlined process and prevented any downtime on site. Even when navigating bends, cambers, and elevation changes, the installation teams adapted efficiently, leveraging prior lessons learned from the A34 scheme to further refine techniques on the A379 project. The result was not only technical success but a positive experience for all partners involved.

Find out more

For more information on Vehicle Restraint Systems (VRS) Solutions, contact **info@hillandsmithinfrastructure.com**

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