

Swanworth Quarry Extension

Heavy plant access bridge construction



Issue

Suttle Stone Quarries have been quarrying out of Swanworth Quarry for the last 14 years. At full capacity, Swanworth was supplying approximately 50% of Dorset's required crushed limestone to the area. The quarry ran out of stone at the end of 2024 having operated on limited reserves since 2022. In December 2022, planning permission was obtained from Dorset Council for an extension to the quarry, which was officially opened in February 2025.

A core objective of the extension proposal was to minimise the impact of the quarry on the local environment; part of which involved minimising the impact of providing access to the extension site which was separated from the existing quarry by a small valley and bridleway. The proposed solution included the installation of a new 21.4m span overbridge to allow HGV access to the new quarry site. The extracted stone from the extension area could then be brought back into the existing quarry to be processed with minimal impact on the environment.

This extension to the quarry will allow 2.4 million tonnes of Dorset Limestone to be extracted over 20 years, for use in a variety of different ways such as sub-base, rock armour for sea defences, gabion stone and decorative chippings.

Suttle Projects' approach to simplify every activity through meticulous up-front attention to detail, buildable designs, and clear communications throughout planning, execution and handover would be essential in getting the new quarry operational at the earliest possible opportunity.

With the existing quarry ceasing production, completion on time was crucial, and had to overcome several challenges and unforeseen ground conditions. In addition, the site was located within the Dorset National Landscape, resulting in the need for special measures including an attending archaeologist for some activities, along with always maintaining access to the existing bridleway.

Solution

The project scope involved enabling works to create a secure site, excavation of the hillside and the creation of access ramps, piling platforms and crane platforms.

The new bridge foundations were constructed using twelve 750mm diameter rotary-bored bearing piles.



Reinforced concrete structures formed the abutments and wingwalls supporting the 21.4m prefabricated steel bridge superstructure. Other activities included the installation of drainage, backfilling of the abutments and wingwalls, construction of carriageway transition slabs, and reinstatement of the bridleway under the structure.

The visual screening cladding along the bridge carriageway was formed using locally sourced cedar cladding and marine-grade timber post and rail frames.

Special Conditions

An important part of the planning application required the existing bridleway to remain in use during the construction works. This was achieved successfully with enclosed working areas on each side of the bridleway to facilitate the construction of the two abutments; the two sections of the bridge decks were then lifted into place from the existing quarry side.



The site is located within the Dorset National Landscape and as a result, special measures had to be taken in preparation for the piling to take place. For example, when the topsoil was removed for the ground to be excavated, an archaeologist had to attend the site to carry out initial investigations, however nothing of any note was found.

Time Constraints

As the quarry had already run out of stone there was a requirement for the new bridge to be completed as soon as possible to commence the extraction and processing of stone from the new site.

Overcoming Challenges

During the piling works the rock was encountered at a much higher level than the ground investigation bore holes suggested. This meant that normal piling techniques could not get past this level.

To solve this problem, a rock core barrel was sourced that fits onto the piling rig for the purpose of coring through hard rock. This worked successfully and allowed the pile design level to be reached.

Some of the complicated cages and concrete formwork sections were prefabricated adjacent to the site to ensure accuracy and provide efficiency, with standardised formwork pans utilised for the abutment wing walls. These were lifted into place using the 70t lattice crawler crane.



Due to the required height of the bridge, installing the shuttering, gabion cladding and reinforcement once the bridge was in place required the use of MEWPs to provide safe access.

The central sections of the visual screening cladding were too obstructive to fix in place on the bridge decks before they were installed but would also take too long to install once the superstructure was positioned. To accelerate the programme, eight large panels were pre-assembled which were then lifted into position from the carriageway once the bridge decks had been installed.

The limestone aggregates used for the abutment backfilling and the stone in the gabion basket cladding were sourced directly from the quarry, avoiding the need to import materials to the site.





Outcome

All works were completed on time and to budget, with the bridge opened for quarry operations two weeks ahead of schedule, providing consistent employment for local people, and minimising the environmental impact of stone extraction in the Dorset National Landscape.

The long-term restoration plan for the original Swanworth Quarry site is to create a rich calcareous grassland, that will extend a nearby rare habitat that is designated a Site of Special Scientific Interest. Suttle Stone Quarries have been working hard where the stone has finished being extracted to implement a re-vegetation programme. Seeds have been sown in phases over several years and the restored areas of the quarry will eventually develop into a mature limestone grassland community. The calcareous grassland habitat supports a diverse community of plant species and wildlife, including the largest national populations of two rare species: the Early Spider Orchid and the Lulworth Skipper butterfly.

Suttle Stone Quarries have ongoing plans to preserve and restore all areas of the quarry as they become empty, extending the areas of grassland and creating new habitats that include pools.

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