

Swanworth Quarry Extension

Client: Suttle Stone Quarries

Value: £1,265,000

Duration: 4 months

Project Detail

Suttle Stone Quarries have been quarrying out of Swanworth Quarry for the last 14 years. At 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 run on limited reserves since 2022. In December 2022 they gained planning permission from Dorset Council for an extension to the quarry which was implemented in late 2024.

A core principle of the extension proposal was to minimise the impact of the quarry on the local environment; part of this involved minimising the impact of accessing the extension site, separated from the existing quarry by a small valley with a stream and bridleway. This was to be achieved by installing a 21.4m span bridge to allow HGV access to the new quarry site, enabling the extracted stone from the extension area to be brought back into the existing quarry to be processed with minimal impact on the environment. This extension to the quarry will produce 2.4 million tonnes of Dorset Limestone which will be used in a variety of different sectors; sub-base for highways and construction schemes, rock armour for sea defences, gabion stone and decorative chippings for house builders and domestic customers.

The full scope of self-delivered works included:

- Enabling works to create a secure site, excavation of hillside, creation of access ramps, piling platforms and crane platforms.
- Excavating for the abutments and installing piling platforms.
- Installation of piling for the new bridge structure, encompassing 12nr 750mm diameter rotary-bored bearing piles.
- Cladding of bridge abutments using gabion baskets, filled with stone from the quarry.
- Installation of drainage and backfilling the abutments, reinstatement of stream and bridleway, installation of carriageway slabs.
- Installation of visual screening cladding along the carriageway using locally sourced cedar cladding and marine-grade timber post and rail frames.
- Full surveying works for the project.

Special Conditions:

An important part of the planning application was that the bridleway would not be closed during construction works. This was achieved successfully, with enclosed working areas on each side of the bridleway to facilitate the construction of the 2nr abutments; the bridge decks were subsequently lifted into place from the existing quarry side.

The site is located within the Dorset National Landscape as a result special measures had to be taken in preparation for the piling to take place. An example of this is that when the topsoil was removed in order for the ground to be excavated to level, an archaeologist had to attend the site to do initial investigations, nothing of any note was found.

Time Constraints:

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

Challenges & How We Overcame Them:

- During the piling works we encountered the rock at a much higher level than the ground investigation bore holes suggested, this meant that we could not get past this level. To solve this problem we sourced a rock core barrel that fits onto the piling rig for the purpose of coring through hard rock. This worked successfully and allowed us to get down to our pile design level.
- Due to the required height of the bridge, installing the shuttering, gabion cladding and reinforcement once the bridge was in place was not possible, we overcame this by using MEWPs to provide safe access.
- A couple of the complicated cages and concrete formwork sections were prefabricated adjacent to the site and lifted into place using the 70t lattice crawler crane, retained on site following the piling works. Standardised formwork pans were utilised for the abutment wing walls.
- The central sections of the visual screening cladding were too big and obstructive to fix in place on the bridge before it was installed, but would take a long time to fabricate once the bridge was in place. This problem was solved by pre-assembling 8nr large panels which were then lifted into position from the carriageway once the bridge decks had been installed.
- Due to the time constraints on this project and most of the work taking place during the winter months, operatives worked on Saturdays throughout November and December which enabled more working hours to be achieved per week, reducing the overall duration of the project by at least a week.

Environmental:

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

Restoration:

Over the last few years Suttle Stone Quarries have been working hard to preserve and restore the empty area of the quarry where the stone has finished being extracted, converting it to calcareous grassland habitat.

The aim of the long term recovery plan at the original Swanworth quarry site is to create a rich grassland, extending a nearby rare habitat that is designated a Site of Special Scientific Interest (SSSI). Seeds have been sown in several phases over a number of years, and following initial years of cutting, the grass has been grazed by cattle and sheep. The grassland supports a diverse community of plant species and wildlife, including the yellow meadow ant, the glow worm and a range of butterflies and moths, enhancing the biodiversity and habitats on site. The calcareous grassland also acts as a carbon store. We have ongoing plans to extend the areas of grassland as the quarry area moves, and create new habitats including pools.

Machinery Used:

70t lattice crawler crane and 300t mobile crane
3t, 5t, 8t and 22t excavators
3t, 9t and 30t dumpers
Roller and whacker plate
All-terrain MEWPs
Soilmec R210

Did we finish on time/to programme/budget

All works were completed on time and on budget, with the bridge opened for quarry operations two weeks ahead of schedule.

Photographs:



Figure 1: A drone view of the formwork being cast for the bridge abutments.

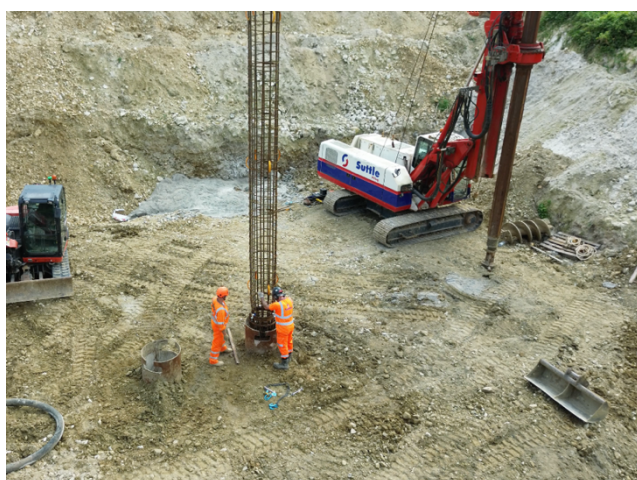


Figure 2: A steel cage being lowered into the ground to form on of the rotary bored piles.



Figure 3: Rotary bored piling works.



Figure 4: Reinforced concrete abutments and gabion cladding.



Figure 5&6: The first of the two 21.4m bridge decks being craned into place.



Figure 7&8: Installation of timber cladding and backfilling north abutment carriageway.



Figure 9: The concrete pad on one side of the bridge



Figure 10: The abutment having been clad in the gabion stone