



# The Birth of a Bridge

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*By Norman Haddow and Dieter Schneider*



Early in 2003 Norman Haddow , a Scottish dry stone waller, was asked to tackle an interesting job. The owners of the land in a remote glen near the village of Butterstone in the Highlands wished to commemorate the engagement of their marriage with a three metre (ten foot) span dry stone bridge built with local rock in the traditional manner.

**T**HE SITE for such a construction would normally be carefully chosen by looking for a narrow gap on the river where large bedrock outcrops could be used as a substantial foundation. Here, however, the site had to be as close as possible to the flat rock where the romantic proposal had been tendered. Fortunately there was an outcrop of bedrock near to but not exactly on the bank. Other large foundation rocks would have to be brought to the site and the banks dug out to embed them.

Four rocks of approximately one ton each were found in from the surrounding area and transported to the site using heavy equipment. The final positioning was done by hand with crow-bars. They were placed so that their flat topsides were roughly level with the winter high water line. Another four large boulders were placed on top of these as risers to withstand the outward pressure from the arch that was to be built.



Now Dieter Schneider, a friend and dry stone waller, joined Norman to assist with the project. A wooden form in the shape of a half moon was made by a local joiner. This filled the gap between the large rocks set into the bank. It was supported on wooden struts that could easily be knocked away to allow it to drop clear of the stonework after the arch was built. To avoid problems resulting from the form sagging, even slightly, it is very important that it be strong enough to support the entire weight of the finished arch -in this case roughly 8 tons. A different system was traditionally used in Scotland called centering, which consisted of two half wheels joined across the top.

Ideally flat-bedded building stones, which can be shaped as required, would be used for the outside face of the arch at least. The rock type in the Butterstone region is a soft, often rounded, mica schist that weathers quite rapidly to blend in with the surrounding countryside. It did, however, cause some problems during the building of the bridge.

Starting with the riser, the arch was built up one course at a time from each side. This was continued gradually until the two sides were close together. At this highest point a complete row of stones was driven into place right across the top of the arch. The result looked like the back of a hedgehog.

Now the arch stones had to be stabilised to prevent any movement, downward or outward, when the form was removed.

This is normally accomplished by driving stone wedges between the stones to pin them in place. The soft local schist, however, tended to crumble when hammered into the tight spaces. Fortunately there were many scattered lumps of granite lying about, deposited about ten thousand years ago when the ice cap retreated from what we now call Scotland. The granite was split with a large mash hammer to create the wedges.

Removing the support is the most exciting time in the building of an arch and a group of spectators gathered to observe the formwork being dropped. It is at this stage that the success of the job is assessed. If there is any movement at all the entire arch must settle very slightly as one.

Access onto the bridge from one bank was already provided by the large piece of bedrock. By the use of stone in-filling the pathway was extended over the arch between the single stone parapets on each side.

Turf was placed on top of the in-filling to form the surface of the path over the bridge. Ideally this turf is taken from a grassy area with few weeds that has not been disturbed for at least five or six years. Each section is cut to a depth of ten centimetres (four inches) and chopped at an angle to ensure a close fit to the next one. It is important to use double sods for this job. The lower turf is placed grass face down and acts as a seal that prevents the soil from filtering down into the stonework. Earth mixed with rock can result in frost damage.

Immediately upon completion the bridge and path over it gave the appearance of having existed for many years.

There was a grand opening of the bridge in August 2003 when family members, friends and workers gathered to celebrate and enjoy a fine lunch together. A piper was ceremoniously followed out to the bridge where the best malt whiskey was poured over the keystones as a final sign of approval. ▣

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*About the authors:*

*During the 1990s a determined effort was made by a group of workers in Switzerland to revive the art of dry stone walling. Several wallers exchanged ideas and experiences between Switzerland and Scotland where there was still a strong lasting tradition of building without cement.*

*Dieter Schneider and Norman Haddow met during this exchange. Both are now enthusiastic professional wallers and find time, even on holiday, when they can work together. They look forward to their next dry stone project.*

