

Our Ref: 13951/MNJ

17<sup>th</sup> November 2021

Issued by Email

Malcolm Manners  
Tyla Glas Farm  
Bedlinog  
Treharris  
CF46 6SN

Dear Mr Manners,

**Structural survey of stone barn attached to Tyla Glas Farm Barn, Bedlinog. CF46 6SN**

Following your instructions, I confirm I undertook a structural inspection of Tyla Glas Farm stone-built barn on Monday 01<sup>st</sup> November 2021. The purpose of my inspection was to advise you of the structural defects with the building and confirm whether the property can be converted for beneficial use.

I can confirm that I am a Chartered Structural Engineer (MIStructE) and I have substantial experience with assessing and converted stone-built structures of this age and form of construction.

The stone barn comprises of a one and a half storey stone-built structure with approximately 500mm thick stone walls and a duo pitch roof finished in concrete tiles. The barn is attached to the main farm house on its right side (as your look at the front elevation) and has additional integrated single storey outbuildings to the rear with a lean-to roof which extends over the single storey structures. The barn's original use is agricultural/work shop.

The cut timber roof comprises of A-frame timber trusses, which supports timber purlins and cut timber rafters. As expected with most old agricultural buildings, the timber roofs tend to be misshapen and generally in poor condition (as in this instance) and would need to be replaced for the barn to be brought back in to beneficial use and in order to support the additional weight of a built-up roof to Building Regulation standards.

It is clear from my inspection that the barn roof structure has moved as a whole, laterally, and diagonal timber bracing members have been installed to prevent this from getting worse. It is likely that the original roof timbers were not designed for the relatively heavy concrete tile finish and they have significantly distorted since as a result.

Inspection of the barn's main four elevations (from internally and externally) revealed that much of the 500mm thick walls were in need of general re-pointing throughout. From inside the barn, closer inspection of the gable elevation (furthest away from the main farm building) revealed that it was leaning over, probably as a result of the movement in the roof.

Inspection of the same gable elevation from the outside revealed an obvious outward lean in the wall. There were no other structural movement cracks in the main walls of the barn that were of a serious structural concern. However there was a vertical crack in the rear wall through to the lean-to building

In order to remedy the movement in the far side gable elevation we would recommend that the top section of the gable elevation is re-built vertically and then tied to the new first floor and roof structure to give it lateral restraint. All other cracks in the masonry walls (as noted above) will need to be stitched using 'Helibar Helifix' (see attached document ref, CS10) stainless steel tie bars.

These works will have the effect of reinstating the structural integrity of the main barn walls.

In addition, I would advise that the top of the walls would need to be re-built with a level concrete wall plate in order to receive the replacement timber trusses. All timber lintels to door and window openings should be replaced with precast concrete lintels.

Care would need to be undertaken when casting a new level concrete floor slab in order not to undermine the main stone walls during these works, however, I can advise you on how best to avoid this in due course.

I confirm that I do not have any structural concerns regarding conversion of the barn in order to bring it back in to beneficial use and I would be happy to provide suitable construction details at a suitable point in the future.

Yours sincerely,



M. N. Jones  
MEng, MICE, MStructE, CEng  
Managing Director for Vale Consultancy



Photo of front elevation of barn showing it attached to main farm house



Photo of gable elevation showing lower external ground levels



Photo of rear roof of barn extending over rear out-buildings



Photo of crack in internal wall and uneven wall plate level



Photo of showing cut roof trusses, purlins and rafters with more recent diagonal bracing



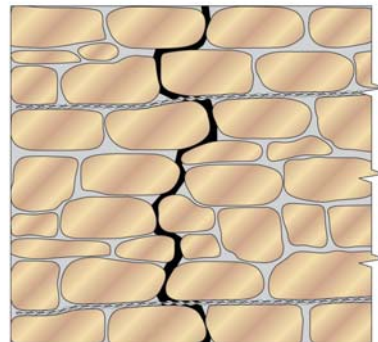
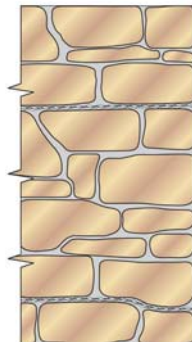
Photo showing misshapen roof structure

# Repair of a Crack Near a Corner in a Stone Wall using HeliBars

## METHOD STATEMENT

1. Using a twin-bladed, diamond-tipped wall chaser and vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing. Ensure that NO mortar is left attached to the exposed stone surfaces in order to provide a good masonry/grout bond. This operation may require the use of hand tools to remove the mortar due to the random nature of the stone.
2. Remove ALL dust and mortar from the slots and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use HeliPrimer WB. Ensure the slot is damp or primed prior to commencing step 5.
3. Mix HeliBond cementitious grout using a power mixer and load into the Helifix Pointing Gun CS.
4. Fit appropriate mortar nozzle.
5. Inject a bead of HeliBond grout, approx. 15mm deep, into the back of the slot.
6. Push the 6mm HeliBar into the grout to obtain good coverage.
7. Inject a second bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond grout as necessary, leaving 10-15mm for new pointing.
8. Point up the remaining slot with a suitable matching mortar and make good the crack using an appropriate Helifix bonding agent depending on the width of the crack.
9. Clean tools with clean, fresh water.

**N.B.** Pointing may be carried out as soon as is convenient after the HeliBond has started to gel.



## RECOMMENDED TOOLING

- For cutting slots up to 40mm deep .....Twin-bladed cutter with vacuum attachment
- For mixing HeliBond .....3-jaw-chuck drill with mixing paddle
- For injection of HeliBond into slots .....Helifix Pointing Gun CS with mortar nozzle
- For smoothing pointing .....Standard finger trowel

## Specification Notes

The following criteria are to be used unless specified otherwise:

- A. Depth of slot into the masonry to be 35mm to 40mm.
- B. Height of slot to be equal to full mortar joint height, with a minimum of 8mm. For thin mortar joint specifications refer to the Helifix Technical Dept.
- C. HeliBar to be long enough to extend a minimum of 500mm either side of the crack or 500mm beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
- D. Normal vertical spacing is 450mm.
- E. Where a crack is less than 300mm from the end of a wall or an opening the HeliBar is to be continued for at least 100mm around the corner and bonded into the adjoining wall.
- F. In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slot, or priming with HeliPrimer WB, should be carried out just prior to injecting the HeliBond grout.
- G. Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves

## GENERAL NOTES

If your application differs from this repair detail or you require specific advice on your particular project, call the Helifix Technical Sales Team on **020 8735 5222**. Our Technical Department can provide you with a full support service including:

- Advice, assistance and recommendations on all structural repair matters
- Devising and preparing complete repair proposals for specific situations
- An insurance-backed warranty via our Approved Installers scheme