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INVESTIGATION REPORT

COLSTERWORTH WAR MEMORIAL

BY

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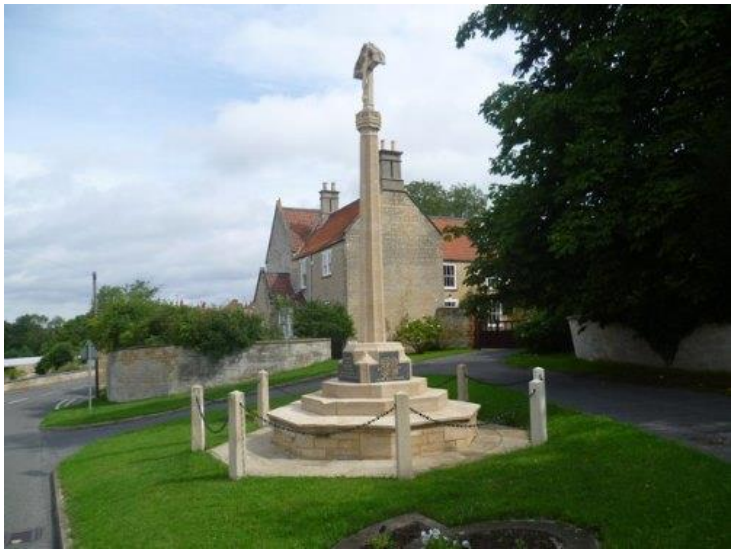
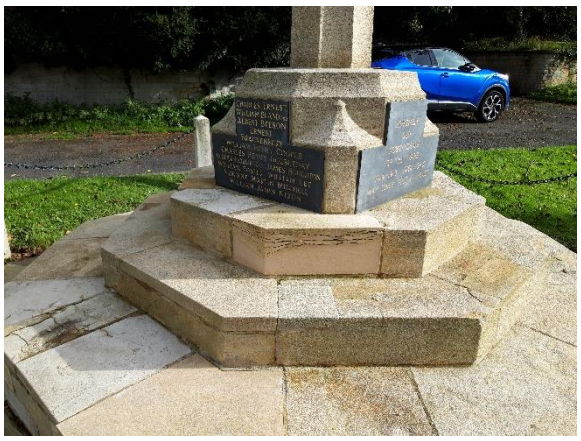
Colsterworth War Memorial – Investigation

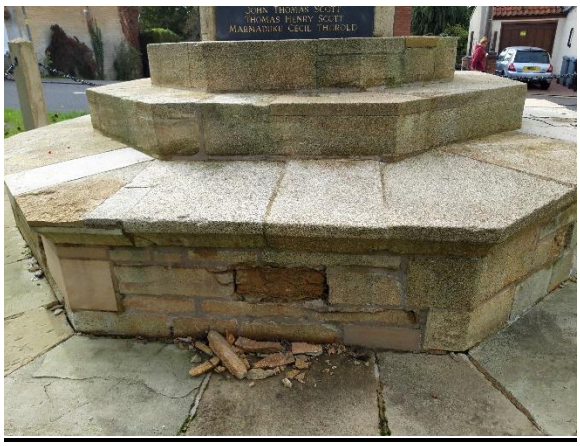
Colsterworth War memorial is a grade II listed structure. It had restoration work carried out in 2010.

It has the following entry in the 'War Memorials of Lincolnshire' by Credland, M.. 2014: *Colsterworth war memorial carries the names of the fallen from the First World War and the Second World War. It is situated on High Street between Bourne Road and Back Lane and was unveiled in 1920. The memorial is made up of a twenty feet (six metres) high wayside cross executed in Clipsham stone.*[1]



Need for investigation





Over the last 10 years the repairs carried out in 2010 have deteriorated at unexpected speed. New Ancaster stone has failed and there appears to be water leaching from the base of the memorial.

[1] Historic Environment Record https://www.lincstothepast.com/War-Memorial--Colsterworth/908985.record?pt=S

General Condition

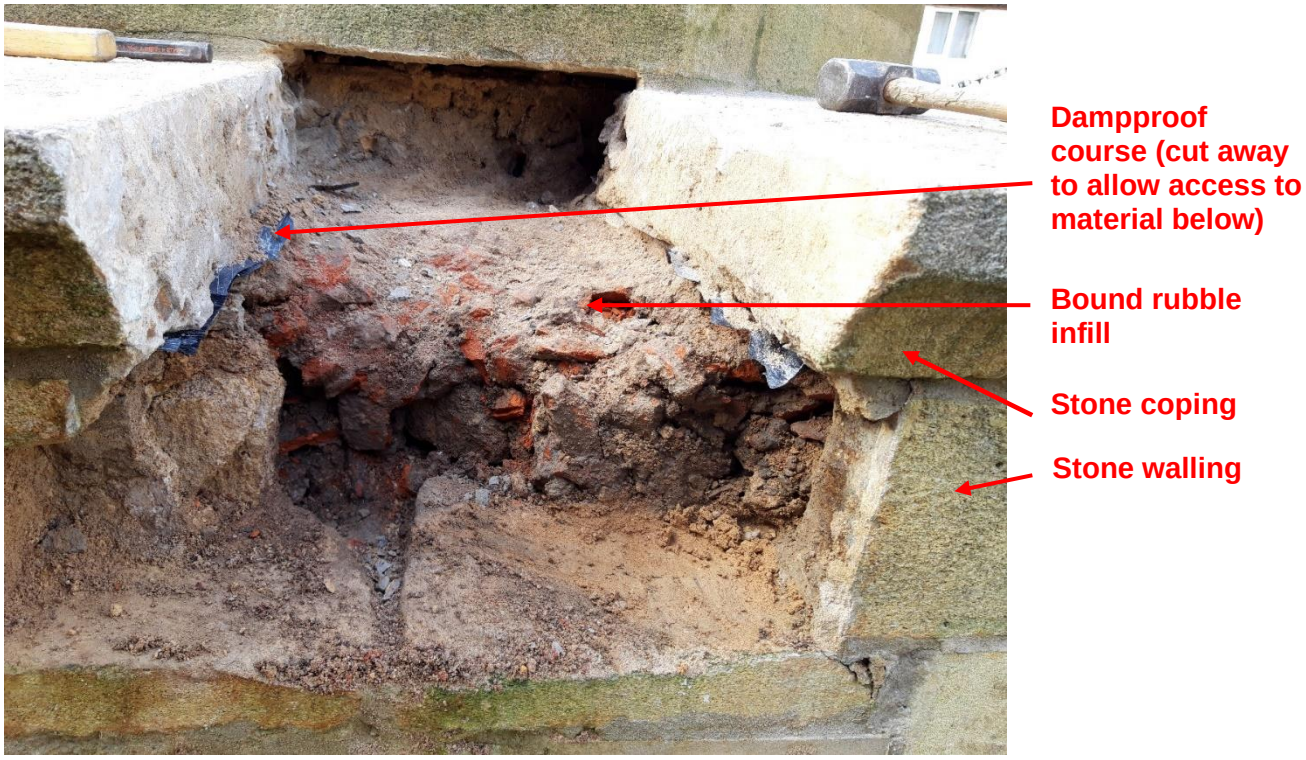
The memorial is generally in reasonable condition with the exception of the repaired areas where the stones are fracturing. The main shaft of the memorial appears stable and the stone is free from vegetation growth and relatively clean. The inscriptions are bright and readable. The main issues appear to be the failing stonework within the plinth, and in addition a continued deterioration of the carved stonework of the cross and crucifixion carving.

Proposed Investigations

Our proposed investigations would carefully dismantle a small area of the lower step of the War Memorial to look at the construction and look for possible reasons for the accelerated failure of the stonework.

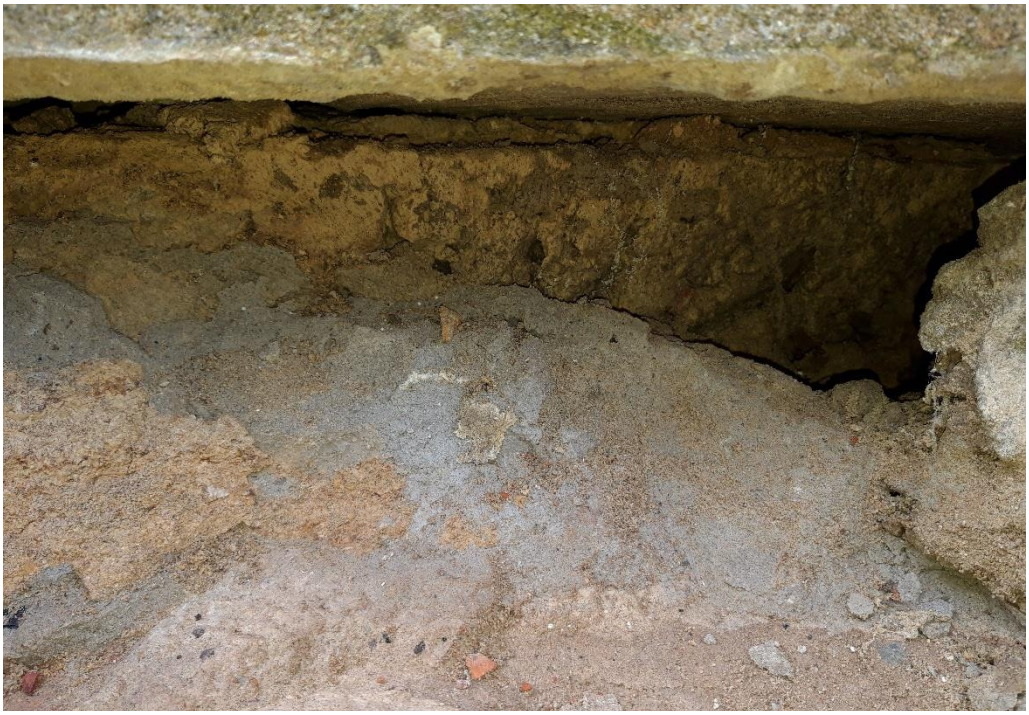
On Monday 17th February the weather was cold but dry. The eastern most face of the memorial was dismantled in order to establish the construction of the memorial. The stone in the poorest condition on this face was removed and then surrounding stones carefully removed, finally the coping stone was removed from the structure. This allowed the make up of the War memorial to be revealed.

As the surrounding green drains onto the area around the War Memorial a flagstone was lifted to examine the bedding beneath.



Opening up of War Memorial

Past interventions



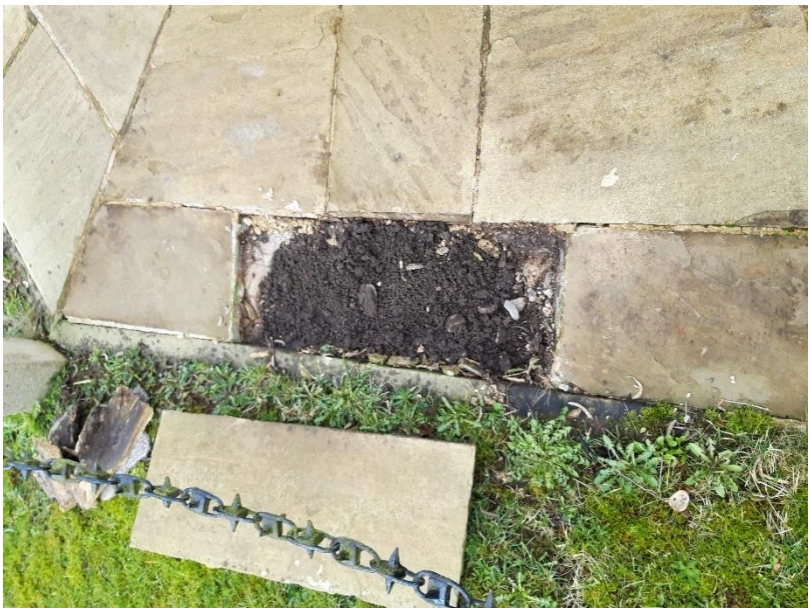
Grey Hard Cement used to bed coping stone in a previous phase of repairs

The structure seemed to be composed of an octagonal stone wall back filled with a rough rubble mix, with a cementitious binder. The rubble binding material provides support for the copings and next step of stonework. It is assumed that this infill also provides support for the central column although this was not verified.

It was clear from the opening up, that the War Memorial has been re-built at least once before. The existence of the damp proof membrane and hard cementitious mortar suggests that previous invasive works have previously taken place. This damp proof course and grey cementitious mortar pre-date the 2010 works, however, given the type of materials used it would be reasonable to suggest that this work was carried out within the last 40 years.

The original stone is not the Ancaster hard white used in previous repairs, but, is a course grained stone containing quartz grains.

Sample of stone taken from the War Memorial



Lifted flag stone

Materials

Bound infill

This appears to be original and is very rough. The rubble elements appear to be brick and crushed stone, of which some elements are quite large. The binder appears to be cementitious in nature, although probably an early 20th century mix. Although there is a cementitious nature to this infill, it would seem likely that its rough and porous nature makes it unlikely to hold water in a way which would be damaging to the stone.

Cementitious Mortar

It is clear that at some point the memorial has undergone a significant rebuild which included the insertion of the damp proof course. At this time the coping stones have were re-bedded using a cementitious mortar. We know that in the 2010 repairs cementitious mortar was removed from the bed joints and the structure was re-pointed in Naturally Hydraulic Lime Mortar. It was perhaps not clear in 2010 that the past rebuilding had meant that this cementitious mortar was used throughout the structure as a bedding material and not just in a past phase of re-pointing. Unfortunately, cementitious mortar does not allow for the passage of moisture through stonework to evaporate in the atmosphere and can cause the deterioration of stone through trapped moisture and freeze thaw action.

Damp Proof Couse

The damp proof course may be the source of some of the current issues. It will certainly be holding moisture against the stone in places, and that coupled with the cementitious mortar may well mean that moisture is unable to escape from the structure. Only the lower ‘step’ of the memorial was dismantled, but it is seems reasonable to conclude the plastic damp proof course may have been installed throughout the rest of the structure.

Stone

There are at least two types of stone present within the structure. Recent repairs have been carried out in Ancaster Weatherbed. The original structure is described in the Historic Environment Record as having been constructed from Clipsham stone. Following the

investigation there was some doubt that the stone was indeed Clipsham as modern samples of Clipsham Stone are much lighter in colour and are finer grained. However, having now consulted Dr David Jefferson of Jefferson Consulting we understand the current Clipsham quarry is producing stone from beds that are much closer to the surrounding Lincolnshire Limestone beds and there is a significant variation in colour and grain of stone. Petrographic analysis could still be undertaken, but given written sources and current discussion it would seem that the stone is a buff coloured large grained Clipsham Stone.

Although there has been some failure of the Clipsham stone, the main areas of failure are those which have been replaced in Ancaster Weatherbed. Ancaster is a hard stone, however it does not appear to have weathered as well as the Clipsham.

Paving
The flagstones are faring well and appear to have been simply bedded on the earth and pointed in a cementitious mortar. Given their lack of firm bedding they may drain reasonably effectively, which is important given the sloping nature of the site. However, they do abut the stone of the Memorial and therefore, it would be useful to consider providing some separation to ensure that there is adequate drainage of the structure and ensure that water is not being held against stone.

Analysis of findings

Opening up the lower section of the Memorial has revealed not only the method of construction but also the phases of repair over the years. The objective was to discover what if anything was causing moisture to be held within the Memorial and damaging the stonework.

The majority of the failing stonework is the replacement Ancaster. This stone should not have been used as the memorial appears to have been constructed of Clipsham Stone. This stone has fared better, although has suffered in some places from retention of moisture. However, current stone samples of Clipsham do differ in colour and texture to the stone used on the Memorial. It will be crucial to ensure that replacement stone is a good match.

The damp proof course inserted in a previous rebuild has trapped moisture within the structure and unless removed will continue to cause moisture to be held within the stone. Stonework needs to be able to expel moisture to air. This takes place through breathable (lime mortar) joints and a damp proof membrane will prevent this moisture transfer from taking place.

The use of cementitious mortar has been detrimental to the structure. There is no moisture transfer though cementitious mortar which means moisture becomes trapped within the stone. The repointing in 2010 will have helped by removing some of the cementitious material, but our investigations show that the mortar has been used throughout the structure including for bedding. In addition over the last 10 years there has been significant research into NHL mortars by Historic England with the result that softer lime putty or hot lime mortars have gained favour.

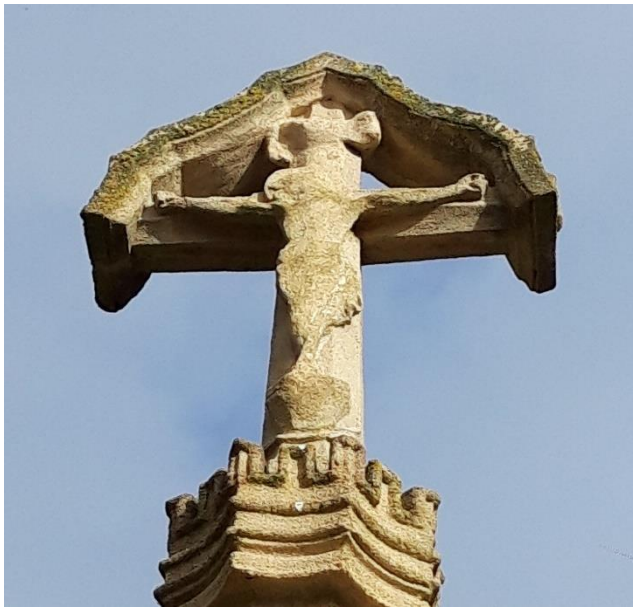
The Cross and Crucifixion

This has clearly deteriorated and some of the detail of the crucifixion has been lost. The works in 2010 which included some repairs and shelter coating of the crucifixion carving. At the time it was recommended that the lime shelter coat was renewed every 10 years. It would appear that this sheltercoat has completely weathered away.

The shelter coating seems to been very effective as there has only been a small amount of further stone loss (above Christ) and this may be as a result of the mortar repair failure. There has also been some moss growth on the cross weathering. The Shelter coat has now completely weathered away and the cross is at risk of accelerated stone loss and weathering.

When it comes to the conservation of such elements there are a number of options, which vary in their cost and impact.

The crucifix prior to work in 2009



December 2019

Option 1 – Do nothing.
This is probably the least appealing of all the options available but, should be examined. The cross will weather away eventually, however, at present it appears to be sound and is not at risk of falling. It will be many years, probably decades, until it becomes unrecognisable and at that point replacement could be considered. However, in the meantime the original could be left to be enjoyed.

Option 2 – New carved cross and crucifixion
The cross could be removed and either displayed indoors or perhaps buried nearby to preserve it as it is now. A new top section would be carved. Some further research would have to be undertaken to see if there are any historic drawings or photographs to aid the stonemasons in producing a replica. This is a controversial approach but not without precedent where the original carving itself is of extreme importance. An example of this approach would be at All Saints Church Pocklington where the top carved section of the Sotheby Cross is now displayed within the church and a carved replica is in its place outside. It should also be noted that this would be a more costly option.

Option 3 – Sheltercoat the Cross
The final option would be to Sheltercoat the top section of the cross again. For this to be effective and to minimise further stone loss, the Parish Council must commit to re-sheltercoat every 5 years and should there be excessive loss in this time potentially more often. This as has already been demonstrated by the success of the sheltercoat applied in 2010. This has been an effective approach which has allowed for the preservation of the existing fabric of the cross. It should be noted that eventually the cross will weather further,

but regular application of the shelter coat, allowing the shelter coat to weather away and so preserving the stone beneath could prolong the life of the carving significantly.

Conclusions and Recommendations

The base of the memorial

All the damp proof course should be removed from the structure along with the cementitious mortar. This work should be carried out without fully dismantling the memorial and disturbing the central shaft. The work should be carried out in stages, carefully taking apart one section removing the old mortar and damp-proof course, replacing any stone and reconstructing using a hot lime mortar. The upper steps of the memorial will need to be carefully dismantled (starting with a single section) to establish if the damp proof course is prevalent in the upper sections of the base. If this is found to be the case (and for pricing purposes it should be assumed it is) then these sections will also require staged dismantlement and remedial work. This solution will take some time as lime mortar can be slow to set and so the work may need to be carried out over some weeks.

All fractured Ancaster should be replaced with Clipsham, however where the Ancaster is holding up is should be left for now. It may require replacing at a later date but there is little to be gained from disturbing the structure more than is necessary. Any fractured Clipsham should be replaced with Clipsham Stone. When sourcing replacement stone it will be crucial that the Stonemason visits the Quarry and selects similar stone. If the quarry beds are inappropriate it may be possible to track down stored lump Clipsham Stone of a similar colour and texture.

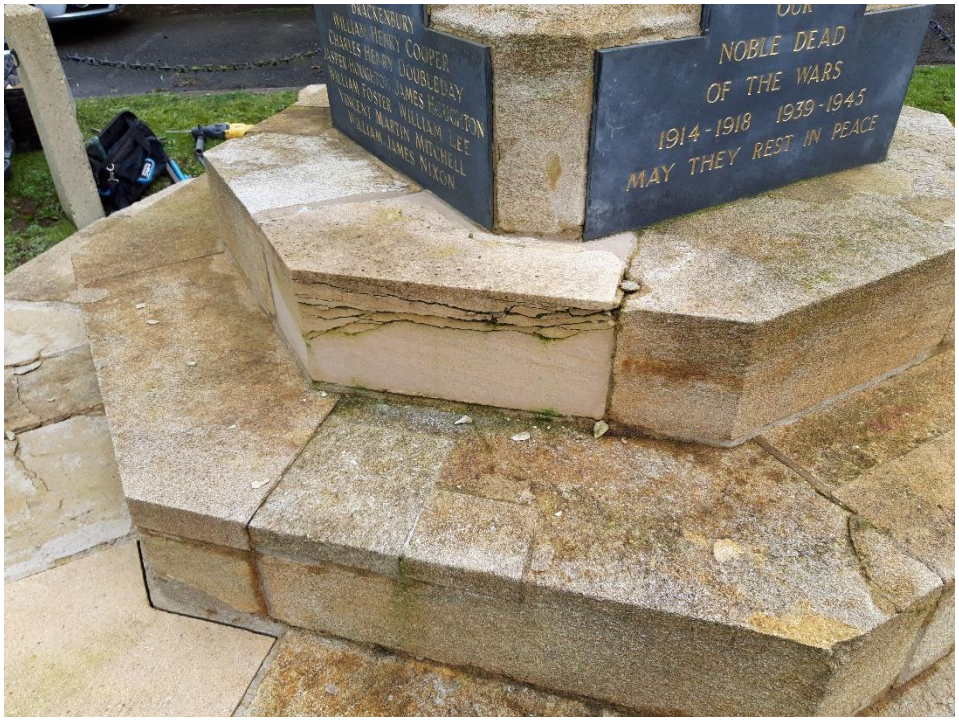
The paving around the base of the memorial

This should be lifted and a well-draining subbase should be installed and the paving should be re-laid. The flags closest to the memorial should be cut and a 100mm gravel margin installed around the base of the memorial to prevent water being held against the base of the stone.

The shaft and cross

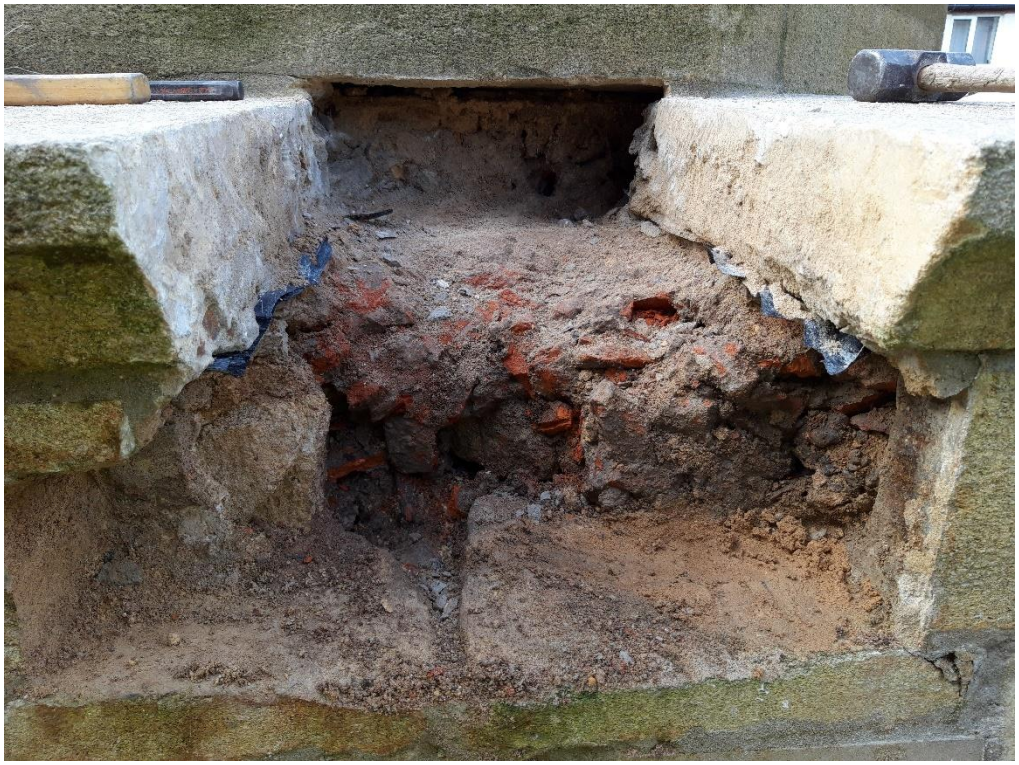
The Shaft is in good condition and requires no work for the time being. The Parish Council will need to review the options available for works to the cross and crucifixion. However, the recommendation of this report is that the cross including the crenelated base are lime shelter coated. Small mortar repairs should be carried out and the moss removed prior to the application of the shelter coat. The mixes should be carefully tested to ensure a good colour match is found. It is crucial that the Lime shelter coating is carried out every five years to ensure its effectiveness.

Appendix A – Photographs

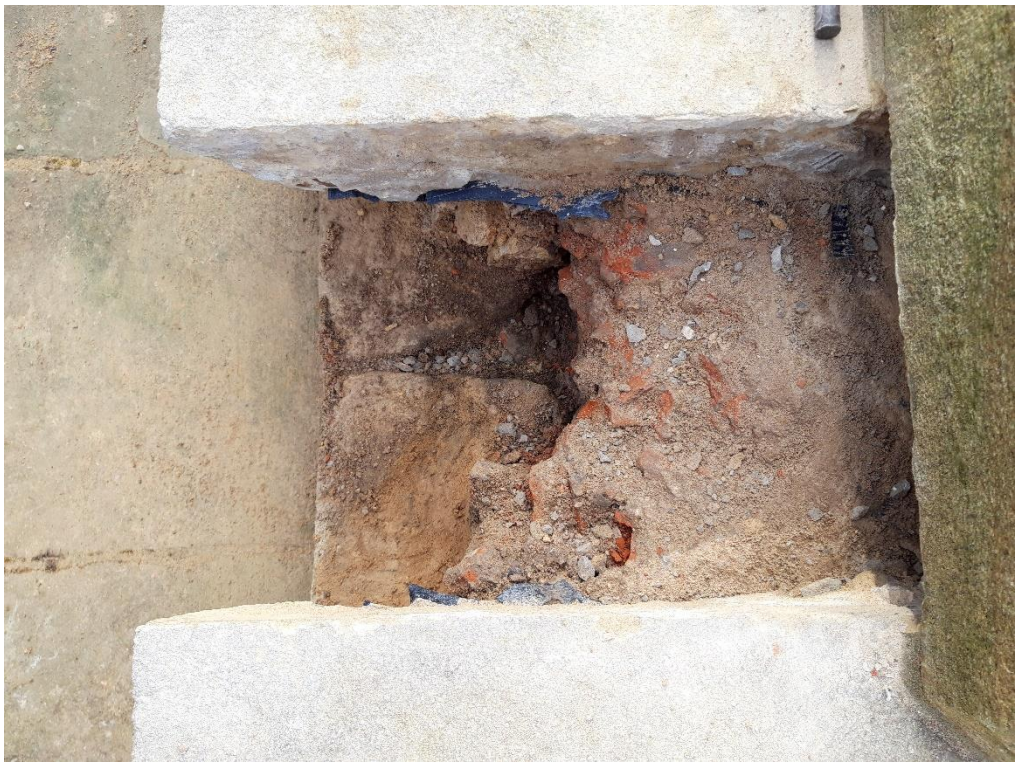


Failed Ancaster Stone

Damp proof course following removal of the coping



Rough bound rubble core



Rubble core and outer stonework