## METHODOLOGY

The archaeological investigation requires that the archaeologist be present on site, to witness the excavation processes, allowing the archaeologist a reasonable length of time to satisfactorily record any archaeology encountered.

It was recommended that the archaeologist together with the assistance of the work force of the appointed Contractor hand excavate three trial holes. This approach to the works is designed to fall between the requirements of a Watching Brief and a controlled archaeological excavation.

It was recommended that the North Yorkshire Consultancy Engineer be responsible for surveying in the exact location of the three selected trial holes. Thereafter the archaeologist would be responsible for directing, assisting and closely monitoring the excavation team. The archaeologist would offer advice in both the method, speed and specific area of excavation.

The Trial Holes

A total of three trial holes each measuring approximately 1.00 m x 1.00 m x 0.90 m. have been recommended. The location of each has been selected to help best determine the nature of the fill on the bridge.

## SUMMARY OF WORKS

The archaeological investigation commenced on Monday 16th March 1998 and the commission had been completed by the close of works on the same day.

The stratigraphy exposed within the trial holes fell into six main categories, namely, those deposits associated with :-

. Level A — The construction of the existing carriageway and the recent installation of a telecommunications service.

. Level B — The construction of a previous carriageway, this compacted layer of limestone chippings suspended in a silty sand matrix is suspected to be late 19th century / early 20th century in date.

. Level C — The accumulation or intentional deposition of a layer of clayey silt on the southern approach and crown of the bridge.

## PLATE 2

Trial Hole No.3, detailing fill of pier.

Trial Hole No.2, detailing fill of pier.

## PLATE 3

Trial Hole No.3, detailing alluvial deposit and rubble fill.

Trial Hole No.3, detailing rubble fill and mortar crust.

## PLATE 4

Trial Hole No.3, detailing mortar crust and void onto arch ring.

- Level D — Construction / repair levels relating to the deposition of a layer of sandstone rubble and lime based mortar over the surface of the main structure of the bridge.

- Level E — The water worn cobble, sandstone and lime based mortar fill of the piers.

- Level F — The roughly dressed sandstone fabric of the super-structure of the bridge arches.

Unfortunately no exact date could be established for the deposition of these levels as no finds were identified during these works. However, it is more than likely, that levels E and F relate to the 12th century construction of the bridge. The date of level D is more problematical, however comparisons of the mortar matrix in levels E and D would suggest that these deposits are contemporary. The provenance of level C is unknown, whilst the deposit has the characteristics of a natural accumulation of alluvial sediment, anthropogenic factors can not be ruled out. It has been suggested by Mr.Smollett, NYCC Engineer that the silty clay may have been intentionally deposited across the bridge as a water proofing membrane, however the absence of this layer on the northern approach to the bridge can not be accounted for unless subsequent repairs have removed same.

As regards the impact of the proposed consolidation works on the monument, the trial holes revealed that the rubble layer (Level D) had voids between the sandstone fragments and the mortar matrix. The voids varied in form and size up to that which could accommodate a 150 mm diametre sphere. It is felt that these may threaten the stability and strength of the structure and would benefit from liquid grouting, however, this should be calculated and assessed by a Civil Engineer. The fill of the piers (Level E) appeared to be extremely well compacted, however, it is understood from Mr.Smollett that a recent structural evaluation on the elevations of the bridge revealed voids within their fill and again may benefit from grouting.

## CONCLUSION

The recent archaeological investigation conducted by Mr.K.J.Cale on behalf of North Yorkshire Consultancy on Kilgram Bridge, East Witton Out Parish has provided a useful picture of the fabric and stratigraphy across this monument.

In light of these works it was recommended in a summary statement, dated 20th March 1998 that the proposed grouting operation will have no visual impact on the monument.

Below the carriageway surface the grouting will encapsulate the above stratigraphy including medieval construction levels, but unless a more sympathetic method of stabilising and strengthening the bridge fabric can be found the monument will eventually deteriorate.

It is acknowledged that the nature of those deposits (clay membrane) overlying those levels requiring consolidation may impede the grouting operation.

No finds were identified during the excavation.

On the 31st March 1998 the archaeologist was contacted by Mr.W.Smollet, North Yorkshire Consulatancy to be informed that a fourth trial had been recently excavated on the monument in order to satisfy engineering questions raised during the excavation of trial hole no's. 1, 2 and 3. The archaeologist was not notified of these additional works nor was he present on site to monitor same.

**Kevin John Cale** **April 1998**

# APPENDIX 1
# THE EXCAVATION RECORD

## Trial Hole No.1

| | |
|---|---|
| Type: | hand excavation |
| Planform: | square |
| Aligned: | east |
| Length: | 1.20 metres |
| Width: | 1.20 metres |
| Depth: | 1.10 metres |
| Context No's. | 1000 - 1007 |

Comments:

The trial hole was excavated so as to ascertain the nature of the fill on the crown of the bridge.

The size and location of the trial hole was determined by North Yorkshire Consultancy, the hole was situated over the centre east arch. The excavation provided an inspection window of the buried deposits on the apex of the bridge, where it had been anticipated that the fill would be of minimal depth.

The stratigraphy identified within the placement were consistent in all four sections.

The arch ribs of the bridge were identified within the base of the excavation, the upper surface of which were situated at 1.10 m below the existing carriageway. This element of the structure (context 1007) consisted of large fragments of sandstone blockwork, the surface of which was roughly dressed with areas of combing. The exact dimensions of this blockwork could not be ascertained as it projected beyond the excavation edge of the trial hole.

The arch ribs were overlain with the main arch span, (context 1006) this fabric consisted of roughly dressed sandstone blockwork, these large fragments of masonry measured up to 0.30m x 0.35m, the length of the blocks could not be established as they projected beyond the excavation edge of the trial hole. The upper surface of the arch was identified at 0.88m below the existing carriageway. In planform it was noted that the blockwork was splayed with the joints between the stones increasing in width towards the upper surface. The joints were only partially filled with a soft lime based mortar, with the effect that large voids, up to 0.30m in diameter were noted between the spayed joints of the masonry. It is suspected that the mortar may have been washed out from between the joints. A crust of the same lime based mortar (context 1005) was found to be sealing the surface of the arch. The mortar measured approximately 0.08 m deep and contained a moderate quantitty of inclusions, nameley water worn pebbles and charcoal flecking. The crust had set hard with a concrete like matrix, the surface gave the appearance of having been deposited and spread in a viscous state. The surface of the mortar was free of indentations suggesting that the succeeding layer of rubble had been deposited on the mortar once cured.

The layer of sandstone rubble (context 1005) found to be overlying the mortar crust consited of angular sandstone fragments measuring, on average, less than 0.35m in size. The rubble was well compacetd with few, if any, voids between the stone fragments. It would appear that the rubble had been deposited in two successive tippings, contexts 1005 and 1004. The upper and most recent of which (context) contained the occasional water worn cobble. The overall depth of the rubble fill measured, approximately 0.30m deep.

A deposit of clayey silt (1003) was found to be sealing the rubble fill, this medium brown (10YR3/3) layer was very well compacted and moist and contained a low quantity of inclusions, namely the occasional water worn pebble. The matrix of the layer was comparable with context 3005 identified within trial hole no.3, however, 1003 was found to be substantially deeper measuring upto 0.25 m. The provenance of this context is insure, it is possible that it has anthroprogenic origins i.e it has been suggested by Mr.W.Smollett, North Yorkshire Consultancy that the layer may have been deposited as a waterproofing membrane over the fill of the bridge, however, the layer was not identified on the northern side of the bridge. Natural accumulation as a result of flooding and trample can not be discounted. It is suspected that the matrix originated locally, it having the characteristics of an alluvial sediment.

The clayey silt layer was sealed by a layer of quarry bottoms (context 1002). This light grey brown (10YR4/2) layer of limestone chippings suspended in a matrix of silty sand was extremely well compacted and had the appearance of a, buried, carriageway surface. The same layer was identified within the other two trial holes indicating that it was present accross the entire span of the bridge.

The modern subbase to the existing carriageway was a layer of limestone hardcore (context 1001), this deposit was similar to context 1002 in the quantity and nature of the inclusions, but was less well compacted. This orange brown layer (10YR4/4) was the same as that found beneath the tarmacaccum surface (context 1000) found accross the span of the bridge.

The spoil excavated from the placement was reinstated within the trial hole in stratigraphic sequence, the upper levels of which would be subject to compaction prior to the reistatement of the carriageway surface.

## Trial Hole No.2

| | |
|---|---|
| Type: | hand excavation |
| Planform: | square |
| Aligned: | east |
| Length: | 1.00 metres |
| Width: | 1.00 metres |
| Depth: | 0.90 metres |
| Context No's. | 2000 - 2004 |

Comments:

The trial hole wasl excavated so as to ascertain the nature of the fill on the northern approach to the bridge. The trial hole was located over the northern pier on the eastern side of the carriageway.

The size and location of the trial hole was determined by the Archaeological Consultant in order to provide an inspection window of the buried deposits on the northern eastern approach to the bridge and to enable a comparison to be made with those observations noted from the excavation of trial hole no.3

The rubble and motar fill (context 2004) of the northernmost pier was identified at 0.47m below the existing carriageway. The yellow white (10YR6/6) sandy lime based mortar. The matrix was well compacted with a high quantity of inclusions, these were dominated by water worn cobbles, limestone and sandstone fragments, these measured less than 0.30m in size. The stone content of the fill was deeply bedded. No voids were noted within this context.

The fill was sealed by a layer of quarry bottoms (context 2002). This light grey brown (10YR4/2) layer of limestone chippings suspended in a matrix of silty sand was extremely well compacted and had the appearance of a, buried, carriageway surface. The same layer was identified within the other two trial holes indicating that it was present accross the entire span of the bridge.

A concrete slab/strip (context 2003) was identified running parrallell and adjacent with the eastern excavation edge. The slab had been inserted into context 2002 and was sealed by the modern sub base context 2001.

The modern subbase to the existing carriageway was a layer of limestone hardcore (context 2001), this deposit was similar to context 2002 in the quantity and nature of the inclusions, but was less well compacted. This orange brown layer (10YR4/4) was the same as that found beneath the tarmacaccum surface (context 2000) found accross the span of the bridge.

The spoil excavated from the placement was reinstated within the trial hole in stratigraphic sequence, the upper levels of which would be subject to compaction prior to the reistatement of the carriageway surface.

## Trial Hole No.3

| | |
|---|---|
| Type: | hand excavation |
| Planform: | square |
| Aligned: | east |
| Length: | 1.00 metres |
| Width: | 1.00 metres |
| Depth: | 0.90 metres |
| Context No's. | 3000 - 3006 |

Comments:

The trial hole was excavated so as to ascertain the nature of the fill on the southern approach to the bridge, over the southern pier on the western side of the carriageway.

The size and location of the trial hole was determined by the Archaeological Consultant in order to provide an inspection window of the buried deposits on the south western approach to the bridge and to enable a comparison to be made with those observations noted from the excavation of trial hole no.2.

The rubble and motar fill (context 3006) of the southernmost pier was identified at 0.32m below the existing carriageway. The yellow white (10YR6/6) sandy lime based mortar. The matrix was well compacted with a high quantity of inclusions, these were dominated by water worn cobbles, limestone and sandstone fragments, these measured less than 0.30m in size. The stone content of the fill was deeply bedded. No voids were noted within this context.

A deposit of clayey silt (3005) was found to be sealing the rubble and mortar fill, this medium brown (10YR3/3) layer was very well compacted and moist and contained a low quantity of inclusions, namely the occasional water worn pebble. The matrix of the layer comparable with context 1003 identified within trial hole no.1 with the exception that this deposit only measured 0.08m deep. The provenance of this context is insure, it is possible that it has anthroprogenic origins i.e it has been suggested by Mr.W.Smollett, North Yorkshire Consultancy that the layer may have been deposited as a waterproofing membrane over the fill of the bridge, however, the layer was not identified on the northern side of the bridge. Natural accumulation as a result of flooding and trample can not be discounted. It is suspected that the matrix originated locally, it having the characteristics of an alluvial sediment.

The clayey siltl was sealed by a layer of quarry bottoms (context 3002). This light grey brown (10YR4/2) layer of limestone chippings suspended in a matrix of silty sand was extremely well compacted and had the appearance of a, buried, carriageway surface. The same layer was identified within the other two trial holes indicating that it was present accross the entire span of the bridge.

A British Telecom service trench had been excatvated along the western edge of the trial hole. The trench (context 3003) had cut each of the above layers and had then been backfilled with the spoil. The fill of the service trench (context 3004) was a moist loosly compacted layer of redeposited material surrounding a metal service duct.

The modern subbase to the existing carriageway was a layer of limestone hardcore (context 3001), this deposit was similar to context 3002 in the quantity and nature of the inclusions, but was less well compacted. This orange brown layer (10YR4/4) was the same as that found beneath the tarmacaccum surface (context 3000) found accross the span of the bridge.

The spoil excavated from the placement was reinstated within the trial hole in stratigraphic sequence, the upper levels of which would be subject to compaction prior to the reistatement of the carriageway surface.

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