

**Interim Statement on the Archaeological Discoveries at Rotherwas March to July 2007 by Ian Bapty<sup>1</sup>, Keith Ray<sup>2</sup>, Simon Sworn<sup>3</sup> and Simon Woodiwiss<sup>4</sup>.**

1.0 Herefordshire Council is constructing a new access road to link Rotherwas industrial estate, to the south-east of the city, to the A49 Trunk Road between Hereford and Ross-on-Wye to the south. Following a PPG16 archaeological assessment which began in 2002 in tandem with the road planning process, an archaeological field project in mitigation of the impacts of road construction on the historic environment has been underway since October 2006, undertaken by staff of Worcestershire Historic Environment and Archaeology Service. This latter project has unfolded through all the stages that would be expected for an infrastructure project, briefed and monitored by the Council's archaeological advisors among the staff of Herefordshire Archaeology, the county archaeological service.

The archaeological recording work being undertaken in advance of works immediately to the south of the industrial estate itself, and at the eastern end of the access road, has involved several stages of work. Significant discoveries were made late in 2006. Excavation of a former watercourse produced deep peat deposits with initial radiocarbon dates of Bronze Age to Medieval. To the east of this, excavation of a series of pits, tree-throws and associated features producing ceramic and lithic finds spanning the period at least c.3200-2000BC. Among such features were eight post-holes defining a circular timber-framed building. One feature comprised a sequence of intercutting pits cumulatively 3m in diameter. The first of these pits contained sherds of mid-late fourth millennium decorated bowl pottery, the second sherds of Grooved Ware vessels of Durrington Walls tradition, and the third sherds of decorated Beaker. Sherds thought to be of plain Beaker vessels were found in association with the circular building. This settlement was located on a relatively level area at mid-slope down a gently sloping hillside at the foot of steep sided hills overlooking the Wye floodplain from the south.

*2.0 Discovery, excavation and description of the Rotherwas Ribbon*

A ditch containing Romano-British pottery and other finds was located at the eastern limit of the open area excavation of 2006, and concern was then voiced that remains of a settlement of this period might lie within the road corridor to the east of this point. As a result, a further area was stripped at the very beginning of the construction programme for the road in April 2007 so that any such settlement could be investigated well in advance of the construction programme here. The strip revealed no trace of further Romano-British activity, but further pits and slight features were found to contain prehistoric material.

Excavation of sections across the Romano-British ditch deposits indicated that it had been cut through a sequence of colluvial deposits filling a hollow, and through an earlier stone surface, itself sealed beneath this sequence of silt deposits. It was then decided that the silt overlying the structure should be removed in order better to define the extent and nature of the surface before any further investigation through it took place.

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At the same time as multi-faceted visual recording of the revealed surface took place, a further extension of excavation was requested to the north within an area to be covered by screening bunds beside the new road. While the impression had been gained from the initial uncovering of a 50m long area of the surface that it might form a crescent shape, the investigation of a further 15m long area transformed its apparent character. Instead of narrowing to form the other end of a crescent, the surface turned through ninety degrees not once but twice as it further descended the slope. It was also apparent that the feature extended north and south beyond the limit of the excavation.

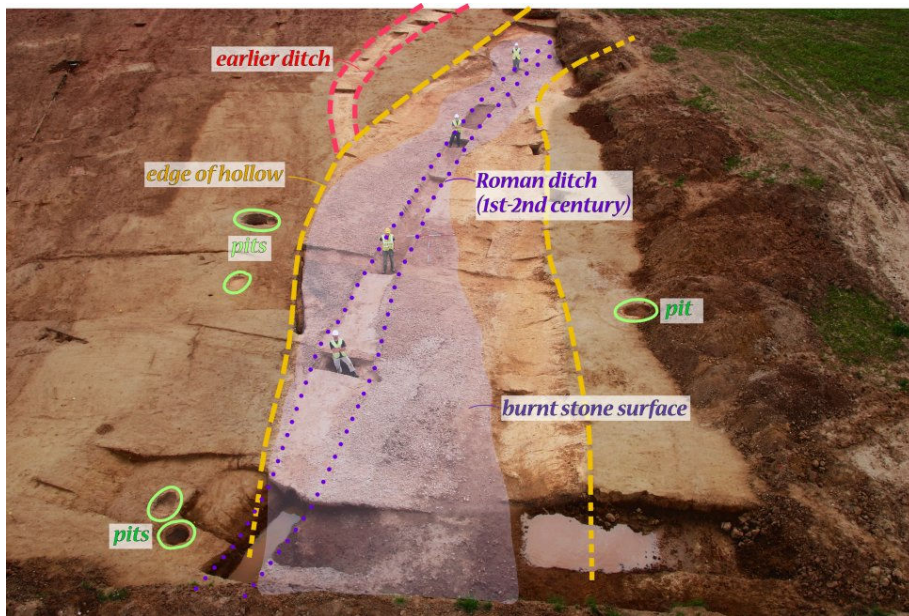
The stone surface comprises a layer of cracked cobbles including a significant element of evenly dispersed quartz. Topographically, the surface also shows marked undulations, and from a vantage-point down-slope the combination of curves and shifting surface profile mean the Rotherwas Ribbon (as it has become known) superficially takes on a decidedly serpentine aspect. Limited intrusive examination of the surface (via trenches cuts across it at an early stage of the excavation before a decision to preserve *in situ* had been taken) revealed some areas where the upper stone surface overlay a secondary lower stone surface, with a silt horizon between the two.

Features spatially associated with the structure include pits filled with burnt/fire-shattered stones and an isolated sub-circular area also made up of shattered stone fragments. Close to one of the pits, a shallow trough-shaped hollow filled with burnt stone and fragmentary charcoal debris extends into/across the stone surface. At the southern end of the excavated area the Ribbon also cuts an earlier undated ditch.

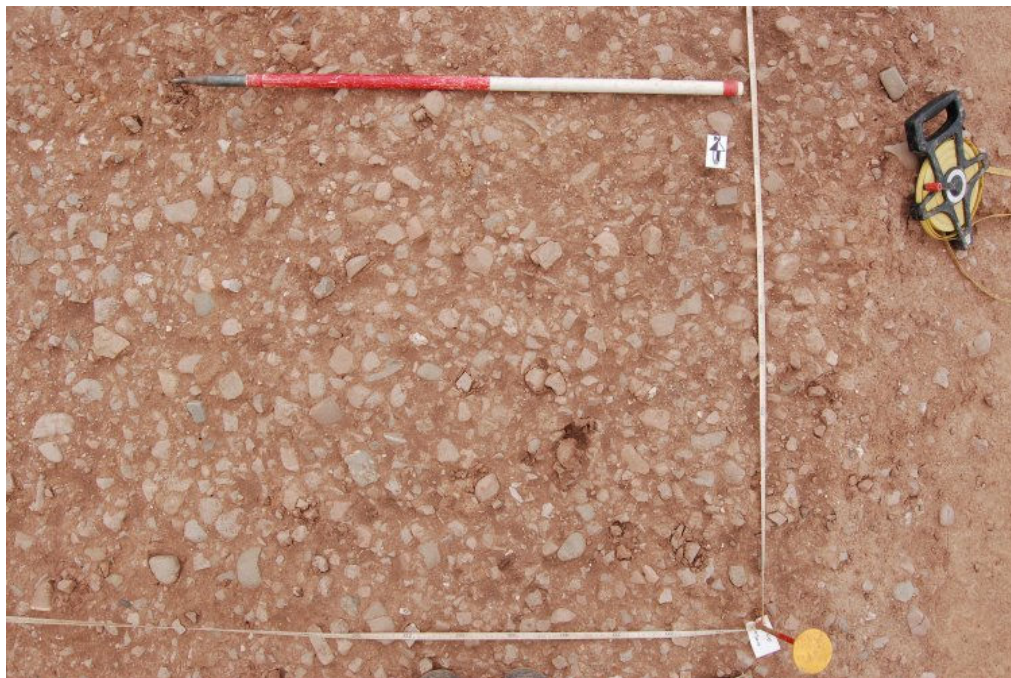
No cultural material was directly recovered from the limited investigation of the Ribbon matrix (limited by the decision to aim to preserve the feature *in situ*), although 9 sherds of pottery, 55 pieces of flint and 239 fragments of bone were recovered from the silts immediately above the stone surface.

Within the standard excavation and recording processes, a full sampling programme was undertaken including a column sample taken from above the stone surface at the northern edge of the excavation. In addition, samples of the cracked stone have been sent to Neil Linford (English Heritage AML) for magnetic susceptibility tests in order to assess whether or not the stone has been subject to artificial heating/burning.

The following photographs aim to present the feature and give some idea of its character.



**Annotated overview of the Rotherwas Ribbon** (Photo Copyright WHEAS)



**Detail of the Ribbon surface** (Photo Copyright WHEAS)



***Partial section through the Ribbon surface*** (Photo Copyright WHEAS)



***General view of the Ribbon looking south*** (Photo Copyright WHEAS)

### 3.0 *Dating*

The dating of the Ribbon has been broadly established through relative stratigraphy. The Romano-British ditch (dated by pottery from the lower fills) which follows a similar alignment to the Ribbon is cut through the stone surface and the overlying silts, and must be a considerably later feature than the Ribbon. The significant quantities of (probably mainly residual) cultural material from the silt layer immediately above the stone surface included a flintwork assemblage (55 pieces)

with diagnostic Bronze Age forms. The earlier ditch cut by the Ribbon did not produce dating material. The Ribbon can therefore be broadly (but securely) dated to the Neolithic or Early Bronze Age, though no more precise attribution within that broad date range is yet possible. The presence of significant proven Neolithic activity in the area immediately to the west, and the reasonable conjecture that the earlier ditch is also likely to be of Neolithic date, could be taken to further support the case that the Ribbon does have Neolithic origins, although this is a purely circumstantial supposition at this stage.

#### *4.0 Nature of the Ribbon*

The process of discovery of the Ribbon in an immediate spatial context of significant multi-period cultural activity combined with the results of the detailed eight week long archaeological investigation of the physical and structural characteristics of the monument, has, in the professional experience and opinion of Worcestershire Historic Environment and Archaeology Service (and the project monitors from the Herefordshire Council Archaeology Service) consistently informed the view that it is wholly, or in large degree, a product of intentional human action. At a basic level of observation, it was clear from the point of its first identification that the Ribbon was of completely different character to the natural watercourse which had been excavated and sampled c.500 metres to the west.

The nature of the Ribbon does appear to support the suggestion that it has been deliberately laid/deposited by human action. The observed character of the stone surface (distribution patterns of cracked pebbles/quartz across the surface and the uniform makeup of the deposit) is consistent throughout the 60 metre length of the Ribbon so far exposed. A significant observation here is that the jagged sides of the cracked pebbles appear to have been used to 'key in' the cobbles to the surface such that the smooth facets typically face upwards. The evidence for what is provisionally interpreted as one or more phases of partial reconstruction of the surface, associated with the localised observation of a lower stone layer of precisely similar character separated from the upper surface by silt horizons, is also consistent with routine archaeological interpretation of stratigraphic sequences of this kind.

The provisional view of the excavators is also that the plan and profile of the linear hollow in which the stone surface sits is similarly consistent with a feature of artificial origin. The directed form of the curves and controlled variation in width of the feature has been judged to indicate a culturally determined landform. The method of formation is unknown, but it may possibly be as a 'hollow way' associated with heavy foot traffic, or may have been deliberately cut as part of the coordinated process of constructing the Ribbon.

It is also important to note the apparently close relationship of the Ribbon to other cultural features. The earlier and later ditches spatially and stratigraphically associated with the Ribbon seem to imply (especially in the case of the later Roman ditch) longevity of cultural use of this particular alignment, and that the Ribbon, for all its unusual nature, represents one specific phase of that long term pattern. In any event it is interesting that the Ribbon is preceded and succeeded by 'standard' linear settlement features. The Ribbon therefore certainly came into being within the period of Neolithic/Bronze Age occupation of the immediate locality, and no re-formation of anything remotely like the Ribbon has occurred at this location since the Bronze Age.

More specifically significant are the five pits which lie on the margins of the Ribbon and which are spatially associated with it (four of the pits are immediately on the eastern edge of the Ribbon cut, with no similar features identified in the large excavated area beyond). Burnt stone, and evidence for burning from these pits

appears to neatly coincide with the apparent construction of much of the Ribbon from cracked stones which have been interpreted as the products of artificial heating and quenching processes. The linear charcoal rich stain/shallow 'trough' feature which extends onto the ribbon from near one of the pits is of particular relevance in seeming to demonstrate that the pits were in use contemporary with the Ribbon, and that, at least in a casual way, there is a direct relationship between the Ribbon and the features around it.

Given the interlocking patterns of specific and contextual evidence which, from the beginning of the investigation, implicitly and explicitly underpinned the cultural nature of the Ribbon, specialist geomorphological input did not form an initial part of the work (although it should be noted that the sampling programme including a columnar sample from above the stone surface). However, the unusual nature of the Ribbon, and the emergent fact that there appear to be no known Neolithic/Bronze Age parallels for such a feature, has pointed up the need to explicitly engage with the possibility that natural processes were involved in its formation (an issue raised by Matthew Canti of English Heritage and described in a report of a site visit on 25<sup>th</sup> July 2007).

A quaternary specialist geologist (Dr Andrew Richards\*) was therefore requested by WHEAS to comment on the feature. Dr Richards comments as follows:

*'The sedimentology of the feature comprises of coarse gravel (<150mm) within a sandy silt-clay matrix. The gravels show no distinct sedimentary features, imbrication or sorting. The gravel clasts are dominantly subrounded and many have been fractured in situ.*

*The in situ fracturing of the pebbles is extremely unlikely to have been caused by cold climate processes. Had ground-ice affected the deposit, the ice would have grown preferentially in the silty matrix, eventually causing the formation of silt lenses and also sorting in the clast content of the sediments. Ice would not have grown in the clasts themselves to form the style of fracturing evident in the sediment (where individual clasts appear to have 'exploded' locally, and the resultant debris surrounds the source clast). This fracturing could only have occurred when the clasts were exposed at- or close to- the surface of the deposit (therefore - the heating, rapid cooling process described to me by Simon Sworn [WHEAS Site Director] makes a lot of sense).*

*The gravel deposit occurs within the alluvium as a single lens, elongated down slope. There are no associated sedimentary features that suggest the action of a fluvial system- structures, sedimentology or external relations with other sediments- that suggest the build-up of the flow rates that would be required to transport gravels of the size. Neither is there a large enough catchment area that would explain flows of this size being generated by slope wash from the high ground above. In addition, were the gravel associated with slope processes, the feature would form a fan shape, or a terrace form following the contours of the valley. In addition, the gravels would be sorted with a change in grain size down-slope. The 'ribbon' shows none of these characteristics.*

*In summary, the best explanation form the formation of the deposit would be that it was 'dumped' by some agent and was subsequently fractured by a process other than crushing or shear- most likely, rapid heating and cooling.*

*Units mapped as the 2nd and 4th Terraces of the River Wye occur near to the site and these are likely to have been the original source of the gravel. Both units are dominated by Lower Palaeozoic sandstones, with local material from the St. Maughans and Raglan Groups of the Lower Old Red Sandstone. The clasts within these terraces are dominantly sub-rounded and contain small proportions of vein quartz.*

*The clast lithology of the 'ribbon' gravels is lithologically identical to the terrace deposits. Although vein quartz is more conspicuous in the coarse sand- grit fraction (perhaps the vein quartz was rapidly heated/cooled in preference to other rock types? or maybe quartz was less resistant to weathering following the heating/cooling process?).'*

\*Dr Andrew Richards (BSc Hons) Geography First Class; PhD 'The Pleistocene stratigraphy of Herefordshire' University of Cambridge, 1994. Published in International journals on Pleistocene stratigraphy, Quaternary sedimentology: Journal of Quaternary Science, Proceedings of the Geologists Association, Sedimentary Geology, Geological Magazine, Earth Surface Process and Landforms, etc. Edited 'Glaciations of Wales and adjacent areas' published 2005.

Following on from Dr Richard's observations, the photograph below shows the residues from the Ribbon and nearby 4<sup>th</sup> river terrace samples for comparison. The sample on the right is from 4<sup>th</sup> terrace, that at the left the upper surface/deposit, that in the middle the lower surface/deposit. Though the samples have the same lithological make up, the degree of shattering between the terrace gravel and that from the monument is markedly different.



(Photo Copyright WHEAS)

It should also be noted in the context of assessing the nature of the Ribbon deposit that the pottery and bone from the top of the stone surface/deposit is not unusually abraded. It may also be relevant to add that preliminary analysis of testing (magnetic susceptibility) for the potential efficacy of geophysical survey undertaken by Archaeological Investigations Limited (Andy Boucher pers. com.) show a distinct contrast between samples from natural soils and the stone surface/deposit.

In summary, the view of Worcestershire Historic Environment and Archaeology Service (formed in consideration of the full range of site observations and the specialist study/comment so far available) is that the Rotherwas Ribbon is most likely of entirely cultural origin, and at the very least is a natural feature which has seen significant cultural enhancement. This view is also supported by the Herefordshire Council Archaeology Service archaeologists monitoring the PPG16 project.

#### *5.0 Specific interpretation of the Ribbon*

Extensive searches within the literature and via communication with Neolithic/Bronze Age specialists have so far drawn a blank in terms of parallels for any contemporary feature resembling the Rotherwas Ribbon, and only conjectural and preliminary interpretations of what appears to be a unique structure can be offered at this stage.

It should be noted the monument does superficially have some characteristics of burnt mounds, a fairly common and well-known monument form, but these are offset by others which seem to prevent its identification in these terms. These arguments are summarised in the table below:



<b>Characteristic conforming to a burnt mound</b>	<b>Characteristic not conforming to a burnt mound</b>
Presence of fire-cracked stones, ash and charcoal (no ash identified)	Not a "mound" (fire-cracked stone is within a linear hollow)
Sited next to a river or lake (close to hillside springs)	Monument may be earlier than Bronze Age (samples have been taken for radiocarbon dating)
Within region where burnt mounds have been identified	Ground plan - monument is sinuous and in excess of 60m long (not oval, crescentic or kidney-shaped)
	Pits lie adjacent to the linear hollow but none may be described as a "trough"
	No "hearth" has been identified

The table has been prepared using characteristics indicated by the English Heritage monument class description for burnt mounds (Raymond, F, 1987, revised by Darvill, T, 1988, <http://www.eng-h.gov.uk/mpp/mcd/index.htm>, 18 July 2007.)

It should also be added in this connection that Mike Hodder has pointed out that fire-cracked stones (without charcoal) can spread from the focus of burnt mounds to form sites of similar extent ([http://www.sal.org.uk/salon/index\\_html?id=636#section22](http://www.sal.org.uk/salon/index_html?id=636#section22)).

Other ideas include the possibility that the Ribbon represents functional improvement/metalling of a hollow way feature, perhaps utilising the readily available stone produced by settlement/burnt mound activity in the immediate vicinity. However, the lack of evidence for significant wear/erosion caused by repeated traffic over it, and the undulating topography of the surface do not seem to immediately support this view.

Another obvious line of argument is the suggestion that the Ribbon has explicitly monumental associations. It is certainly large enough to have formed a significant feature in the landscape visible from the ridge to the south which includes Dinedor Hillfort (itself with indicators of earlier activity). In this sense, the apparently sculpted and serpentine form of the Ribbon may tentatively be connected to a range of possible representative/symbolic associations (snake/cord/river?).

## 6.0 Significance

Clearly, the matter of detailed interpretation will require much further analysis and debate and will not be easily resolved.

However, regardless of the specific interpretation of its purpose, it is possible to be clear that the Rotherwas Ribbon is of considerable potential significance, being an apparently unique (if enigmatic) feature with important relevance to the understanding of local, regional and national Neolithic/Bronze Age sequences.

## 7.0 Outstanding issues

**Extent and nature.** The extent and character of the feature beyond the proposed road corridor is not known. This is a key issue because it means that it is impossible to determine what proportion of the feature is represented by the section within the road corridor, whether the excavated section is properly representative of the structure as a whole, and whether the patterns and structural evidence so far observed (and on which the provisional understanding of the structure is based) are consistently reproduced in other parts of the monument (such as, for example, the nature and continuing presence of the 'cut' in which the Ribbon surface sits, the detailed nature of the surface and the underlying matrix, the undulation of the surface, and the serpentine plan of the feature). It is obviously possible that understanding of the structure could significantly alter when its extent is clarified, and when other sections are examined and described.

In addition, it should be added that accurately determining the full extent of the structure is fundamental to devising appropriate management and conservation processes for the Rotherwas Ribbon as a whole.

**Date.** The date of the feature has only been broadly determined within the investigation of the currently known section of the monument. There is an important need to identify additional dating evidence through the recovery of associated artefacts and other material suitable to support a radiocarbon (and/or other) programme. The identification of such evidence cannot, of course, be guaranteed by sampling additional areas. However, the character of the feature as so far observed, and its close association with other cultural features, supports the view that there is a reasonable chance elsewhere of retrieving diagnostic dating material of direct or close contextual relevance to the Ribbon.

**Preservation and condition of the Ribbon.** The preservation and condition of the Ribbon beyond the PPG16 excavated area is not known, although it is considered likely that it may be well preserved in the area downslope of the recent excavation. Determination of the depth, preservation and condition of the feature is, together with the identification of its extent, a key requirement in determining appropriate approaches to long term conservation and management.

**Public interest in the Ribbon.** The initial discovery of the Ribbon, and the considerable media and public interest this generated (such as attendance of around 1000 people at public open days) has also created an expectation of further investigation and opportunity for further public engagement with the monument. While this is not of itself the primary justification for further investigative fieldwork, it is important that provision of proper public access to the Ribbon (intellectual and, if and when further sections are exposed, physical) is incorporated as a key part of future analysis/project work.

## 8.0 Current status of the Ribbon investigation

All reasonable PPG16 excavation, recording, sampling and public engagement processes have now been undertaken (within the constraint that a decision was made by Herefordshire Council early in the excavation process to preserve the Ribbon *in situ*, thereby also restricting further intrusive/destructive investigation of it, and leading to the recent reburial of the monument for conservation reasons).

Although evolving post excavation analysis (including specialist analysis of artefacts, soil samples, radiocarbon samples so far obtained, and magnetic susceptibility analysis of stone samples) will further advance understanding of the feature, the

major issues identified above can only be substantially addressed by a further process of fieldwork beyond the road corridor.

