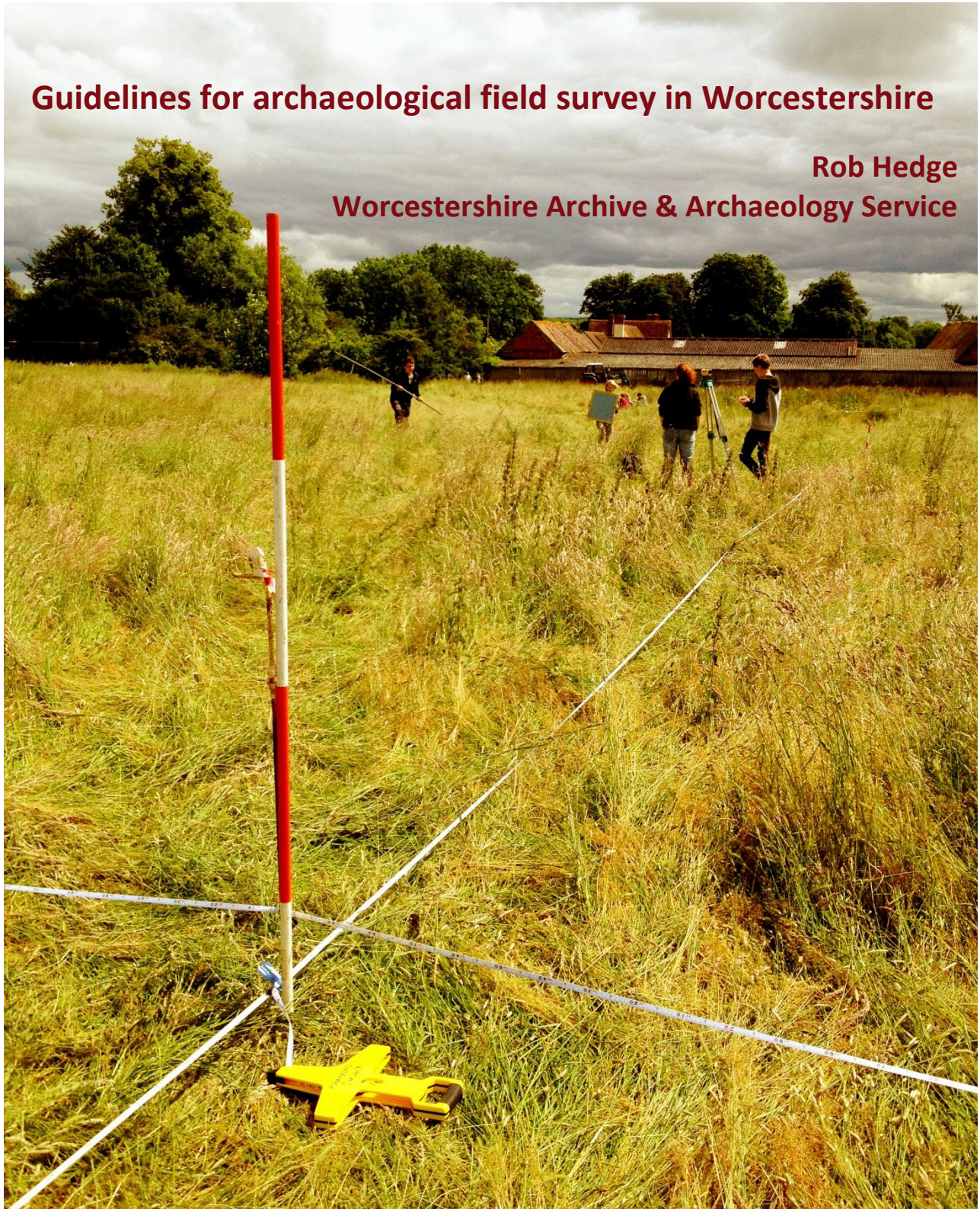


# Guidelines for archaeological field survey in Worcestershire

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Worcestershire Archive & Archaeology Service



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# Guidelines for archaeological field survey in Worcestershire

## 1 Introduction

### 1.1 Background

In an environment of increasing budgetary and capacity constraints on local authority archaeology services, Worcestershire Archive & Archaeology Service (WAAS) is keen to provide training and assistance to those undertaking archaeological research in the voluntary sector. These guidance notes are intended to assist people wishing to undertake their own survey projects.

### 1.2 What is archaeological field survey?

Field survey is the process of visiting a site of known or suspected archaeological potential, making notes, taking photographs, measuring and drawing the archaeological features and disseminating the results. It may incorporate documentary and/or cartographic research and the gleaning of local knowledge. The end result might be anything from a detailed report to a plan with a few paragraphs of description.



Archaeological Earthwork Survey at Crowle, 2013

Common to all field survey work is the process of looking at a site carefully and systematically. This can be extremely rewarding, especially as you, the surveyor, may be the first to look at the site in such depth through an archaeological lens.

### 1.3 Why is it important?

Archaeological field survey is one of the best non-intrusive tools we have to gather information about the nature of a site, its condition and any potential threats to its stability. However, it can be quite time-intensive, and with tens of thousands of sites on Worcestershire's Historic Environment Record, we simply don't have the capacity to survey them all, so any contribution that can be made by volunteer researchers is really important. Furthermore, new archaeological sites are discovered all the time, and without high-quality information on such sites it is much harder to ensure that they are adequately looked-after and considered as 'heritage assets' in the planning process.

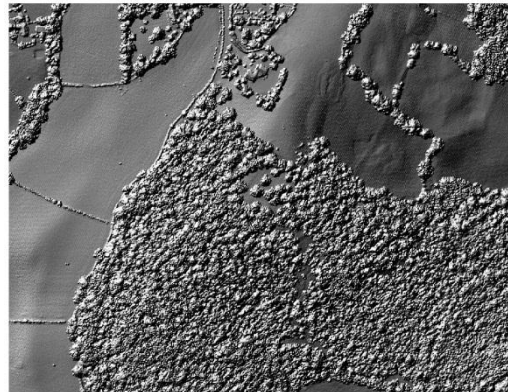
## 1.4 What needs recording?

There's a huge variety of sites of archaeological interest, many of which have elements visible as above-ground (or 'upstanding') features. These might include walls of former houses, agricultural, industrial or military buildings, or land management features such as drains, culverts, bridges or pumps.

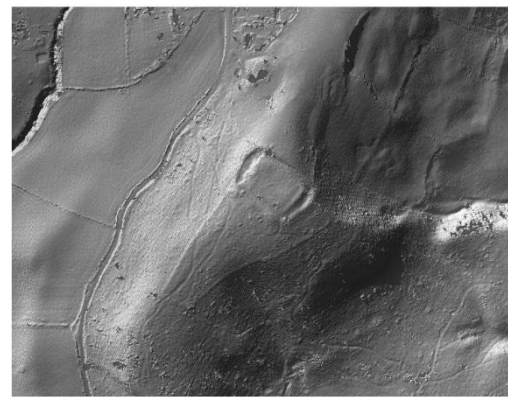
There are also hundreds of 'earthwork' sites around the county – 'lumps and bumps' which comprise the traces of a plethora of types of human activity, from Bronze Age barrows and Iron Age Hillforts to quarries, moats, mills & fishponds via 'ridge & furrow' agriculture and deserted medieval villages. New sites are discovered all the time, and with new remote-sensing techniques such as LiDAR we are identifying more and more potential sites of interest.

However, a LiDAR image alone is rarely sufficient to tell us all we need to know about a site, and good old-fashioned boots-on-the-ground survey

with low-tech, low-cost equipment still plays a vital role in understanding the nature and condition of sites of archaeological interest.



LiDAR survey showing tree cover



Tree cover removed revealing Iron Age enclosure

LiDAR survey, Wyre Forest

## 1.5 HER integration – How, why and when?

The Historic Environment Record is a growing database which records the archaeology of Worcestershire. It is a powerful tool which is used for research but also to inform the planning process. By integrating information gained through archaeological work, whether that is carried out by professional archaeological units or local groups, a more complete picture of the history and archaeology of Worcestershire can be built. This is a great help to our efforts to protect and manage the historic environment.

When first considering undertaking a piece of archaeological work, an event number should be requested from the HER office. This is a unique number which should be quoted on all paperwork for the site. This unique number is then added to our database and allows us to identify areas where work is being carried out. It also allows us to easily cross reference submitted reports with the correct site. An HER search may be requested at the same time as the event number. This search retrieves all database entries for a particular area in addition to a sources list and relevant historic mapping.





Generally, yes! Check with the HER first, but even in cases where we may have old plans or LiDAR imagery/aerial photography, field survey records can be invaluable. A field survey allows the observer to interpret what they're seeing, to assess the condition of a site and whether it's at any risk, to observe any changes since it was last recorded and to record details that aren't visible from the air, such as vegetation cover and architectural details.

### 2.1.3 Other Sources

It is worth asking landowners, tenants and local residents if they know anything about the site, or if they know of any previous research. Local history societies may have more information, or may have carried out surveys of their own that have not made it into the public domain. In any case, it is generally considered good practice to keep interested local parties informed about your work – they may be able to offer help, advice and contacts, and may be interested in the results of your work.

## 2.2 Getting Permission

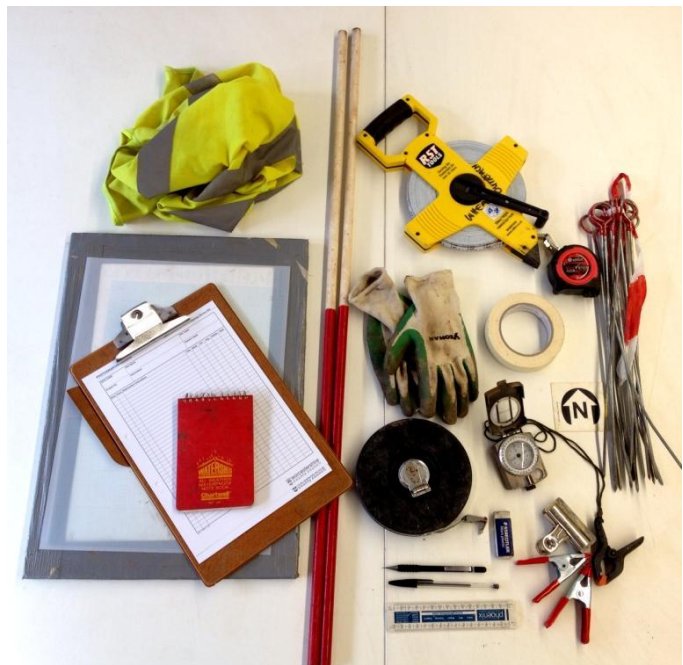
Before undertaking any fieldwork, it is vital to get permission from the landowner to access the site. You will also need permission to carry out any work such as cutting-back or removing vegetation to improve visibility. Be aware that removing vegetation can destabilise upstanding walls or banks, so take care to assess the chances of this before removing any material. If in doubt, seek advice!

## 3 Getting Out There

### 3.1 Equipment

The equipment you will require will depend on the type of survey you're undertaking. Here's a basic list of essentials for producing a measured drawing:

- Sturdy notebook, with good-quality paper (waterproof notebooks such as those made by Chartwell are a good investment!).
- Stiff clipboard with A4 sheets of drafting film or quality drawing paper, and masking tape for fixing sheets into position.
- Good quality magnetic compass, from which accurate bearings can be taken.
- Pencil – hard pencils are best for survey drawing as they smudge less and retain a sharp point for longer. Use 6H / 7H for drawing on drafting film, or 4H / 6H for



Equipment for a measured tape-and-offset survey

paper. It is worth trying out different combinations before you head out into the field. Most professional archaeologists will use 6H / 7H.

- Scale ruler: a 150mm ruler with multiple scales, including 1:20, 1:50, 1:2500 etc is a useful tool & fits into a pocket. 300mm triangular scale rules are more widely available but less convenient.
- 1:25,000 Ordnance Survey map of the area.
- 1:2500 Ordnance Survey plan of the site location: the HER can supply these in PDF format if you've contacted them to request information.
- Long fibreglass measuring tape: ideally 50m. 'Closed-reel' type tapes are more convenient to transport but more prone to jamming and less easy to rewind than 'open-reel' types.
- Survey 'pins' or large tent pegs, coloured red to aid visibility.
- Bulldog clips to secure long measuring tapes.
- Digital Camera.
- Photographic scales (sometimes known as 'ranging rods') – these come in a variety of lengths. A good all-rounder is a 1m long scale painted half red, half white. It is worth taking two of these, to be arranged in a 'T' shape for effective scaling of photographs. Fold-away versions can be bought.
- Good boots! Comfortable, waterproof boots are invaluable. Ideally, they should provide some ankle support – slips and trips are common when clambering over lumps & bumps, and a sprained ankle in the middle of nowhere is no laughing matter.
- For the above reason, it can be best to work with others. If circumstances necessitate lone working, ensure someone knows where you're heading, your mobile phone is charged and you're carrying a basic first aid kit.

**Ranging rods** can be made quickly and cheaply: cut a wooden dowel rod to size, spray with several coats of white hobby spray paint. Wait until dry, mask off the half to remain white at the 50cm point, then spray the other half red.

### 3.2 First Impressions

Before launching into a detailed scale drawing, take some time to observe the site. What is its extent? Are there other related features nearby such as trackways or watercourses? Are there any aspects which might provide evidence of the function of the site (i.e. demolition debris, certain types of vegetation, architectural features or fittings etc.)? Make some notes. If working in a group, discuss your interpretations.

### 3.3 Initial sketch

It can be helpful to make an initial sketch of the site. In some cases, this may be all that is required, or all that you have time to do. Alternatively, it may help you to understand a

Before doing this, it's a good idea to **check the average length of your pace!** Lay 10m of tape out on the ground, then walk along it. Divide the paces taken by the length walked to find your average.



site before carrying out a more detailed measured survey. Although a sketch doesn't need to be accurately measured, it can be helpful to 'pace out' dimensions. For estimating heights of banks and walls, you can use ranging rods.

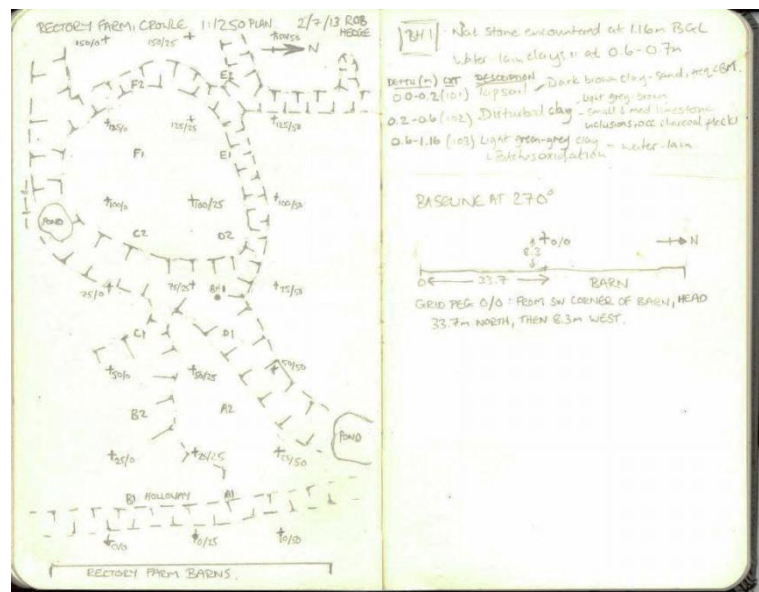
If using drafting film, it may come printed with a faint grid. In this case, place a white sheet of paper behind the film, and secure both to your board. If there is no grid, it can sometimes be helpful to place a sheet of graph paper behind the film to give you a guide whilst drawing.

### 3.3.1 What to include

- Remember to include location information on your sketch. This could be anything from a point measured with a hand-held GPS device to annotations on the sketch showing distance and direction to known points located on OS maps, such as the corners of fields, buildings or roads. Try to get at least 3 well-spaced points marked, if available. Sometimes, you may find yourself in the middle of a wood with no

distinguishing features whatsoever! In this case, try to give a rough indication of location, such as '200m NW of junction between footpaths X & Y'.

- Before starting, check that you'll be able to fit your drawing onto one sheet, and orientate your board or notebook accordingly
- When surveying earthworks, remember that you are creating a 'birds-eye' plan view. Your drawing should show the top and bottom of each man-made slope. These are known as 'breaks of slope'. The angle and direction of the slope is denoted by 'hachures' (see **Drawing Conventions**, Appendix 1). It can sometimes be difficult to tell the difference between natural slopes, natural slopes that have been enhanced by human activity, and man-made features. If in doubt, record it – you can always come back to the drawing later and remove elements.



Sketch Plan of Rectory Farm, Crowle

#### Finding the 'Break of Slope'

This can be tricky, especially where earthworks have lost their definition after centuries of erosion. One method is the 'toe-test'. Shuffle carefully towards the top of the slope, feeling with your toes for a change in angle. Repeat at the base of the feature to find the bottom break of slope.

- If you're recording upstanding walls, it can be helpful to visualise your drawing as a 'slice' through the structure, just above the ground. It can sometimes be difficult to gauge the point at which a wall becomes a jumble of rubble, particularly if the site is overgrown. Make sure any uncertainty is noted on the plan, and don't be afraid to use the 'uncertain edge' type of line, detailed in the **Drawing Conventions** appendix.

### 3.3.2 Labelling your plan

- Add any dimensions you have measured or paced
- Include a north arrow
- If recorded at an approximate scale, include this information
- Include the grid reference of the centre of your site, if available. Ideally, this should be expressed as an 8-figure reference, e.g. **NGR SP 1234 5678**, which gives an location to 10 metre accuracy
- Add a 'key' to any abbreviations or drawing conventions used. Conventions can vary and change over time, and it is important that anyone viewing your work in the future can interpret the symbols you've used!

## 4 Measured Survey: Tape-and-offset planning

'Tape-and-offset' planning is the most effective and accurate method for low-tech, low-cost survey of archaeological sites and features. It is a technique used on archaeological excavations as well as above-ground surveys, and can be very accurate.

The basic principle is to set out a baseline or small grid using 30/50/100m long measuring tapes secured by pegs, and then measuring points on the site against the baseline, before plotting these points onto a sheet of 'drafting film' and joining the dots to create an accurate plan of the site.



Tape & Offset planning

### 4.1 Setting up a baseline or grid

- First, choose a 'baseline' along which to set out a tape. This is generally done along the 'long axis' of the area to be surveyed or parallel to major features, with the start and end of the baseline extending beyond the limits of the site. Alternatively, you may prefer to align it north-south or east-west if there is no obvious pattern to the features.
- To set out the baseline, pin the zero point of the tape into the ground using a visible marker like a ranging rod or survey pin. Run the tape out along the length of the baseline, trying to keep it as horizontal and as taut as possible! At the end of the

tape, secure it at the 30/50/100m point with another peg (this is where the bulldog clips come in handy!). Then go back along the length of the tape placing intermediate pins in the ground at 10m/20m intervals, depending upon the size of the site.

- If the site covers a broad area, it can be useful to set up a parallel baseline, making a grid. This is where your school maths teacher finally triumphs, as it is a case of a practical application of Pythagoras' theorem!
  - Run a second tape roughly at 90° from the zero point of your baseline, 4m in the direction to which you wish to extend the grid.
  - Take a third tape, and starting from the 3m point on the primary baseline, run it towards the 4m mark on the second tape.
  - Hold tapes 2 and 3 together at the point where 4m on tape 2 meets 5m on tape 3. Mark the point.
- You now have a point at 90° to the 0m point of the original baseline. Run tape 2 out as far as you need to extend the grid, then mark the 0m point of the new secondary baseline.
- Repeat at the far end of the original baseline to give you the endpoint. String a line between the two points, and you will now have a parallel baseline.



Setting out a grid

Pythagoras' Theorem:

$$a^2 + b^2 = c^2$$

So, in practical terms, if the lengths of the three sides of a triangle are 3m, 4m and 5m, a right angle will always exist at the intersection of the two shorter sides.

## 4.2 Taking Measurements

Set out the baseline or grid on your drawing board, ensuring that you choose an appropriate scale. Ideally, you want a scale that enables you to fit the site onto one sheet of drafting film, but at a scale at which features can be easily plotted. For a single building or small extraction pit, 1:100 might be ideal, but if you're plotting features across a wide area something like 1:500 might be more appropriate.

### Small & Large Scale:

Remembering the difference can be tricky. On a SMALL scale map, individual features are small, e.g. OS 1:25,000.

On a LARGE scale map, features are large & more detail is possible, e.g. a 1:100 site plan.

The smaller the scale, the less detail can be shown.



SCALE	DISTANCE ON GROUND	DISTANCE ON DRAWING
1:500	10m	20mm
1:200	10m	50mm
1:100	10m	100mm

- Starting at the 0m point of the primary baseline, select the nearest feature to be plotted. If part of the feature crosses the baseline, mark the point.
- Now, measure the 'offsets'. Select a point of interest, like the edge of a wall or top of a bank. With the help of, ideally, two other people, have one person hold the 0m end of a long tape at the point of interest, whilst the second person runs the tape back across the baseline, turns, then swings the end of the tape back and forth across the baseline until they are satisfied that they've got a right angle.
- Once satisfied, the second person should read off the coordinates of the intersection: first read off the distance along the baseline, then the offset distance to the point of interest. The third person should plot this point on the plan.
- Continue until all points of interest such as corners, breaks of slope and edges are plotted for that feature, and then join the dots, add 'hachures' to mark the direction of any slopes. Stand back and compare, then repeat for the next feature.
- Once all are plotted, ensure that all labels are comprehensive and accurate as possible, as outlined in section 3.3.2, and that your drawing follows the conventions outlined in Appendix 1.

## 5 Taking Photographs

A high resolution digital camera, with at least 7 megapixel resolution, is an essential tool for archaeological survey. If possible, set the camera to save images in TIFF format rather than JPEG: although TIFF files are larger than JPEGs, they are 'uncompressed' and have the advantage that, unlike JPEGs, they do not deteriorate in quality with repeated opening and saving.

A lens with a focal length of 50mm or more is ideal for photographing upstanding archaeological features like buildings or structures. Ensure that shots are in focus and well-lit. A tripod, if available, can be useful for composition. For other types of site (e.g. earthwork sites), the combination of low sunlight, high contrast and low vegetation makes the winter months ideal for bringing-out low-lying features in a photograph.



Low January afternoon sun reveals the remnants of a Bronze Age barrow, Kempsey Common ©Rob Hedge

Include ranging rods for scale in at least some of your photos, although it can also be beneficial to take some photographs without scales. Where scales are included, try to make sure that they are lined up parallel to the edges of the shot, otherwise they can appear untidy and distracting.

It is often useful to include a range of different views within the photographic record of a site. As a general rule you should include

- A general view of the structure in its setting or landscape
- Detailed shots of individual components of the site, e.g. standing walls, floor platforms, banks or ditches
- Working shots of the survey in progress, showing techniques, weather conditions, vegetation etc. These not only help to illustrate any report you may wish to write, but can also provide useful background information for anyone looking at your work.



A picture tells a thousand words! Surveying in waist-high vegetation, Crowle Summer 2013 ©WAAS

It is worth noting the photographs you've taken on a list as you go, recording the following information.

- Photograph Number
- Direction of shot (e.g. SE, NW)
- Short description of picture, e.g. 'north-west corner of bank'
- Details of any ranging rods used, e.g. '2 x 1m'
- Date, and initials of photographer

If the site is large or complex, annotating your site sketch with the photograph number and a small arrow indicating direction can be helpful.

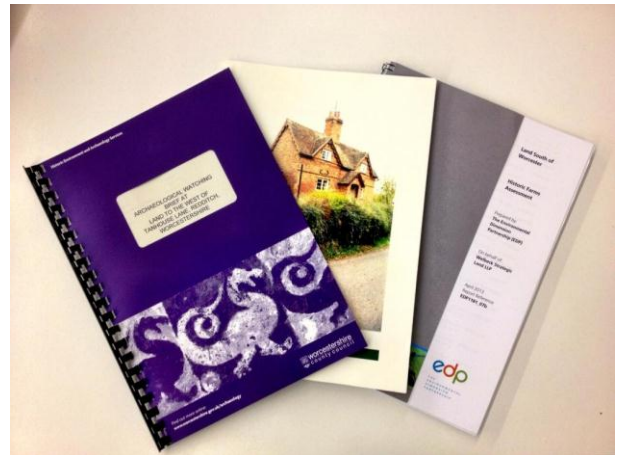
When you get home, remember to download your photographs, and make sure the file names can be matched to your field records! It is a good idea to back photographs up onto an external hard drive, CD or memory stick as soon as possible to insure against computer problems.

## 6 Writing a Report

This is a vital but much-feared and misunderstood aspect of archaeological survey work. A report doesn't have to be onerous or stressful, and can be as long or short as you like. A concise, succinct report can be much more useful than a lengthy treatise. The form your account takes may depend on whether there is much existing documentation on the site: if this is the case, you may wish to focus more on the condition of the site, any visible threats and any new features identified.

It is often helpful to start with a summary, containing the following information:

- **Site Name:** does your site already have a name? If not, keep it short and relevant, e.g. 'Earthworks at Field X / Farm X' or 'Lime Kiln off X Lane'
- **Grid reference:** Take the approximate centre point of the site, expressed as an 8 figure grid reference, including the 100km two-letter 'Prefix' code, e.g. 'NGR SP 2345 6789' – this gives position to the nearest 10m.
- **'Monument type':** what is the site? English Heritage maintain a Thesaurus of site types, which can be very helpful when trying to work out whether you've recorded a 'Marl pit' or a 'Bell pit'! The thesaurus, which forms the basis for record descriptions in the HER, can be found and explored here: <http://thesaurus.english-heritage.org.uk/>
- **A single sentence describing the site**, which can be used as a summary description for the HER database entry, e.g. 'A group of three partially ploughed-out Bronze Age barrows, surmounted by the remains of a WW2 observation post'.





Once you have this, you can add a couple more paragraphs of detail, including the following:

- A description of the **site 'setting'**: what is the surrounding flora? Is it wooded, in pasture, within a built-up area? What is the topography: is it atop a mound, on a slope, within a depression, next to geographical features such as a stream or rocky outcrop?
- An **assessment of the 'condition'** of the site: is it overgrown or unstable? If there are structural remains such as walls, how much of these survive? If there are earthworks, how well-defined are they? Is there evidence of burrow damage or erosion?
- Is the site **aligned along a particular axis**? For example, a Holloway may run 'north-west to south-east', or an enclosure may have 'an entrance in the south-west corner'.
- If the site is particularly complex or appears to have multiple different phases/functions, it can be beneficial to break it down into sections and describe each separately. If this is necessary, make sure that your site plan is adequately labelled.

Your record can be further enhanced by adding any documentary evidence you've collected:

- If the site is shown on historic maps or plans, include details and (if copyright permits) images.
- If you have other documentary records such as news articles, estate records, trade directories etc., discuss these. Remember to reference them appropriately!
- Personal correspondence or comments from local sources of knowledge can be included, but be sure to attribute them appropriately and check facts where possible!

Now, the fun part: include a few paragraphs on your interpretation of the site. Try to avoid wild speculation, but don't be afraid to put forward your opinion. Always show your working: if you believe site X was a mill, highlight the evidence that supports your interpretation.

Lastly, don't forget to include a high-quality copy of your sketch or measured plan, together with a location plan showing the site's location within its surroundings.

For further advice on report writing, see WAAS's *Guidelines for recording, reporting and publication of archaeological research in Worcestershire* (2014).

## 7 Glossary

**Cartographic:** Relating to mapping

**Hachure:** A drawing convention used to indicate man-made or artificially altered slopes. Spacing, length and direction of the annotation indicate steepness, length and direction of slope. See Appendix 1 for examples

**Historic Environment Record:** the database, maintained and managed by WAAS, which contains records of all known archaeological sites, monuments and events in the county, in addition to historic maps, LiDAR data and aerial photographs.

**Holloway:** A sunken path, etched into the landscape over years of erosion due to foot, hoof or cart traffic and water run-off. Can indicate former field boundaries and routeways removed by post-medieval enclosure of land, or industrial activity such as quarrying or mining.

**Large Scale Mapping:** Large scale mapping refers to maps on which features appear relatively large, i.e. 1:100 site plan.

**LiDAR:** Stands for Light Detecting And Ranging – a remote-sensing survey technique whereby an aircraft-mounted laser fires pulses of light to provide high-resolution topographic data. The advantage of LiDAR over traditional aerial photographic survey is that tree canopies and overlying vegetation can be 'stripped away', revealing underlying archaeological features.

**Small Scale Mapping:** Small scale mapping refers to maps on which features appear relatively small, i.e. 1:50,000 OS Maps

## 8 Bibliography & Online Resources

The BAJR web portal contains informative and accessible guides:

<http://www.bajr.org/BAJRread/BAJRGuides.asp>

Past Horizons supply a comprehensive range of survey equipment, including virtually all the items mentioned in this guidance: <http://www.pasthorizontools.com/>

A suite of useful guidance including 'check-lists' and links to relevant documents, is available at the ISGAP (Introduction to Standards & Guidance in Archaeological Practice) website: <http://www.isgap.org.uk/> ISGAP is the result of a collaboration between English Heritage, the CBA and the IfA.

The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) produced a wonderful resource for the 'Scotland's Rural Past' project in the form of 'A Practical Guide to Recording Archaeological Sites' (2011). Although focused on recording abandoned Scottish farmsteads, the principles are universal, and it is a first-class guide, with a wealth of useful illustrations, covering in great depth survey methods not discussed here such as 'Plane table' surveys and detailed building elevation recording. It is available from their website as a free PDF download: <http://www.scotlandsruralpast.org.uk/>

English Heritage's Monument type thesaurus can be found here: <http://thesaurus.english-heritage.org.uk/>

## 9 Contacts

For HER enquiries, contact the HER Workroom on 01905 765560 or email [archaeology@worcestershire.gov.uk](mailto:archaeology@worcestershire.gov.uk)

For advice and support in planning Community Archaeology Projects, contact Rob Hedge on 01905 765654 or email [rhedge@worcestershire.gov.uk](mailto:rhedge@worcestershire.gov.uk)



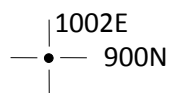
## APPENDICES

### APPENDIX 1: DRAWING CONVENTIONS

If there is a variation or addition to the convention, annotate the plan or section, or make a note in the description of the record. Lengths of lines given are approximate.

#### General

Grid point – with easting/northing.  
At least two on each plan  
eastings first, northings second



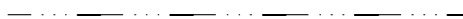
Location of level/spot height



Edge of excavation/trench edges



Temporary edge of excavation/  
test trenches



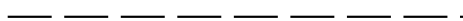
Edge/limit of features



Base of cut features or slopes/inclines  
(used in combination with hachures)



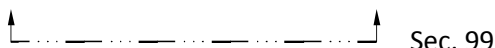
Line of truncation



Uncertain edges



Section location - mark section no. at  
one or both ends

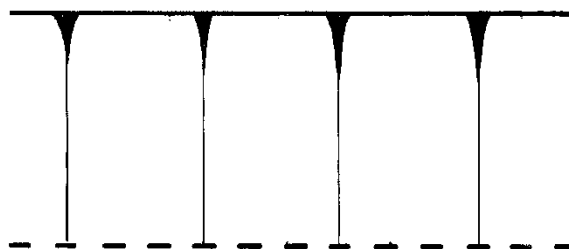


#### Hachures

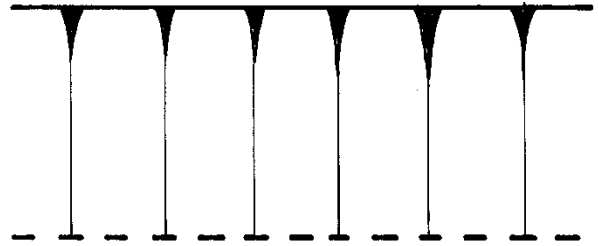
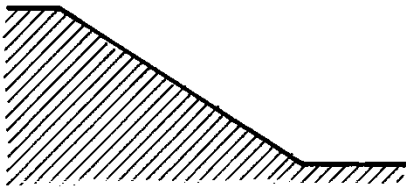
Hachures are used to show the direction of a slope. The head of the hachure represents the top of the slope and the length of the hachure represents the horizontal distance from the top to the bottom of the slope. The closer together the hachures are, the greater the incline being represented.

The examples below can be used as a guide.

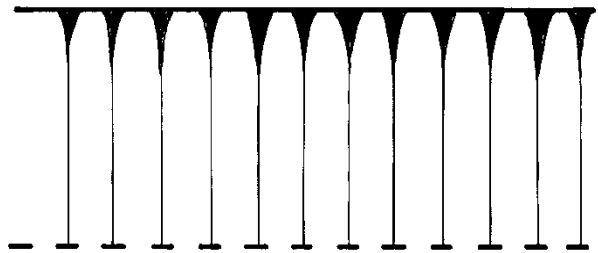
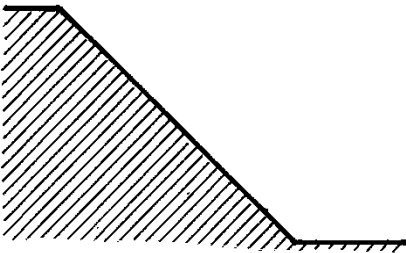
Gentle



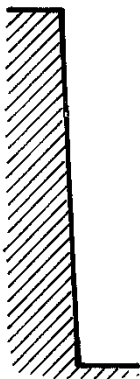
Sloping



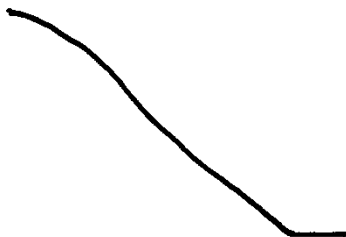
Steeply sloping



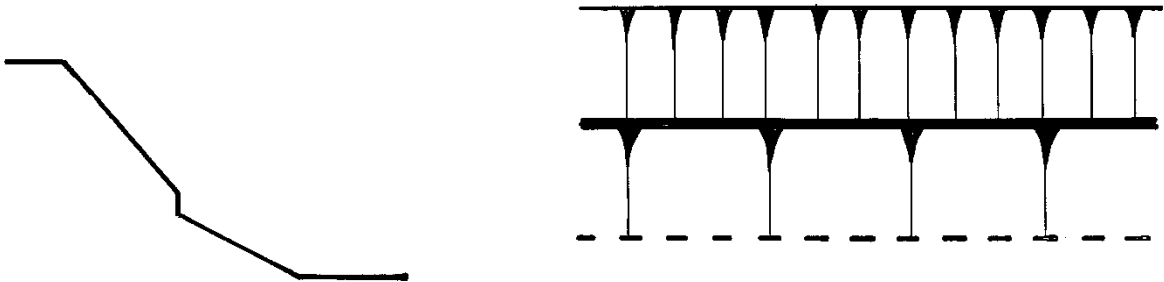
Vertical



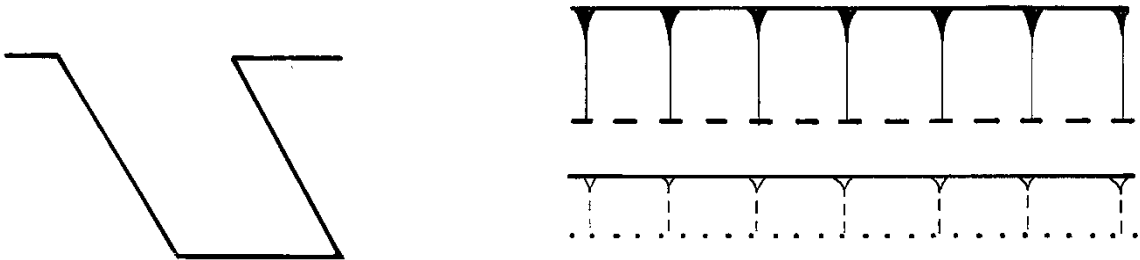
Gradual



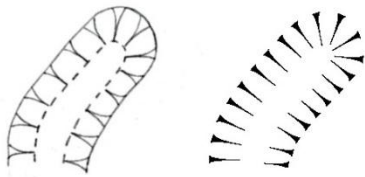
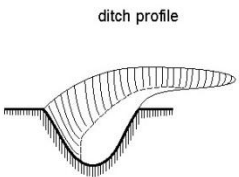
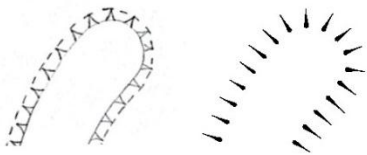
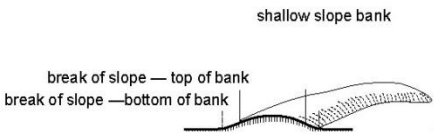
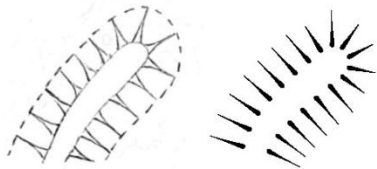
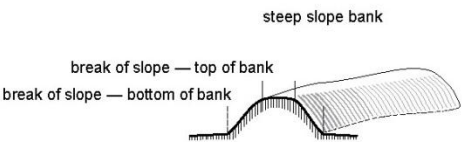
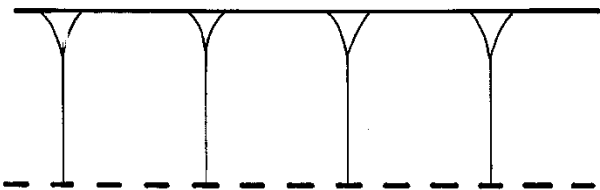
Changes in slope



Undercut feature



Horizontally truncated feature



GV004918

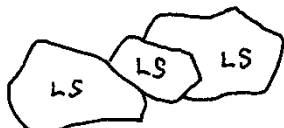


## Materials and inclusions

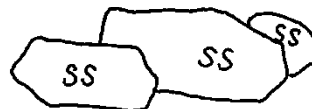
If it's necessary to identify materials or inclusions on a plan – e.g. ash charcoal sandstone – use simple symbols to identify. Make notes on every plan where this occurs to explain the new convention. Make sure any notes are legible and that any new symbols or conventions clarify rather than confuse the drawing.

These are examples of the type of symbols that may be used:

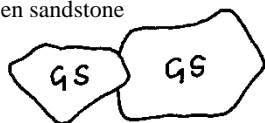
Limestone



Sandstone



Green sandstone



Water worn (pebbles, cobbles)



Quartz



Granite



Tipped stone



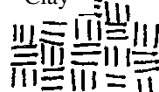
Gravel



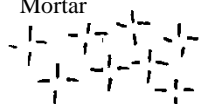
Sand



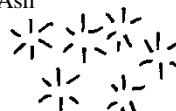
Clay



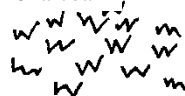
Mortar



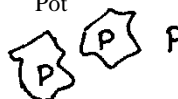
Ash



Charcoal



Pot



Flint



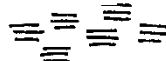
Bone



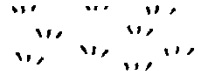
Lias



Silt



Loam



Slag



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