



Galloway Glens 'Can You Dig It' Community

Archaeology project.

Survey Skills - Training Workshop Note

Surveying

A major part of all archaeological work is to accurately record your subject material, be that a historic standing building, a prehistoric standing stone or whatever has been uncovered within a trench that you've just excavated. Most archaeologists these days will use the most up-to-date surveying techniques and equipment such as total stations and global positioning systems (GPS), which are expensive and require extensive training, but they also still use older, more simple methods such as baseline (tape and offset) and plane table surveys.



Scale

Making sure your survey is scaled properly is important. Most archaeological excavation drawings use large scales such as 1:10 or 1:20, but for surveying small earthworks or historic structures in the wider landscape, a smaller scale is often used such as 1:50 or 1:100. If you're surveying a larger number of structures or a large earthwork, you may opt for an even smaller scale such as 1:500 or 1:1000.

Below is a quick guide for these various scales:

- 1:10 - 1m in the real world is 100mm on your drawing
- 1:20 - 1m ... is 50mm
- 1:50 - 1m ... is 20mm
- 1:100 - 1m ... is 10mm
- 1:500 - 1m ... is 2mm
- 1:1000 - 1m ... is 1mm

Baseline (Tape & Offset) Survey

A baseline survey is a method of recording archaeological sites by creating a scaled drawing using 30m and 50m measuring tapes, pegs and a wooden drawing board covered with graph paper and drafting film (commonly known as permatrace), as well as assorted stationery.

The main baseline is set out close to the subject matter (such as a ruined medieval building or prehistoric cairn). The baseline is replicated to scale on your drawing board and then measurements, offsets, are taken at right angles between the baseline and the subject matter. The result of this on your

drawing will be, for instance, the curve of one side of a cairn or the corner or sides of a building.

The baseline can also be easily extended using scaled ranging poles (2m high). You simply place one at the start of your baseline and one at the end. Then stretch out another tape from the endpoint to the desired length and use a third pole, which will need to be lined up with the other poles on the first stretch of the main baseline.

Judging the right angle of an offset from the baseline at short distances (2-3m) can often be done by eye, but error can easily creep in at longer distances. To get around this, it is sometimes best to create one or more secondary baselines off the main or starting baseline. This can easily be done by using the Pythagoras' Theorem of the 3:4:5 triangle, which can be extended to create 10m or 20m baselines (6:8:10 and 12:16:20 triangles).

These secondary baselines are used in exactly the same way as the main one, and further baselines can be extended off them too, so that the entirety of your subject matter can be recorded from every angle.



Baseline Survey at Old Kirk, Kelton (June 2019)

Problems can occur where the ground is uneven, there are high walls, or the ground slopes etc. These can be solved by using ranging poles at both ends of the offset to raise the measuring tape (sometimes using a spirit level). This means hard-to-access parts of your subject matter, such as the inner face of a buildings wall, can also be surveyed.

Plane Table Survey

A plane table survey is another method of recording archaeological sites which utilises a drawing board (which is covered graph paper and drafting film) attached to a survey tripod, a 30m or 50m tape, pegs, plumb bob, spirit level, a 2m ranging pole and assorted stationery. Another piece of specialist equipment needed is an 'alidade', which is essentially a flat, ruler-shaped object, which could be made from metal, wood or plastic. At both ends of the alidade are two attached upright sights.

This type of survey has been in use from at least the 16th century in Europe, although it may have been in use long before this. The alidade itself dates to at least the 15th century, but again may be older, and has Arabic origins - 'al-*idāda*' meaning the revolving radius of a circle.

The survey process starts with the alidade being placed flat upon the drawing board and set against a drawing pin which marks the centre point of the board. A plumb bob is then attached to the underside of the drawing board so that it directly overlies a survey point on the ground (usually marked out with a wooden or plastic peg). The end of the 30m or 50m tape is then held at the peg at ground level or at the drawing pin marking the centre of the board. The other end of the tape and a 2m survey pole are then placed at a point of interest on your subject matter (e.g. the wall of a building or edge of a ditch) and the sights of the alidade are used to line up with the survey pole. A line is drawn along the edge of the alidade from the centre point on the drawing board, and a scale ruler used to accurately mark the point of interest on your

drawing. This process continues until you have fully recorded your subject matter, or recorded as much as can be seen from your initial survey point.



Plane Table Survey at Polmaddy deserted settlement (July 2019)

Further survey points on the ground can be added so that the hard-to-access parts of your survey subject matter can be recorded, such as the rear of a tall building or large earthwork. To do this, first ensure that both your original and new survey points are recorded on your first drawing. Set up the plane table, with a fresh sheet of drafting film on the board, over the new survey point and make sure as before that both the new and old survey points are on the new drawing. The drawings can then later be combined by overlaying them, making sure the recorded survey points line up. This allows a final drawing of the subject matter to be completed.

Extending your Survey Techniques

Baseline and plane table techniques are how most archaeological surveys are carried out, but there are variations of these surveys and also other types of field survey which you can try your hand at. For more information on archaeological surveying, you should check out the '[Scotland's Rural Past](#)' website, a project that ran from 2006 to 2011. This project was run by the Royal Commission for Ancient and Historical Monuments (now Historic Environment Scotland) to help local communities across the country record historic rural settlements. They produced an online book which shows a range of techniques, such as baseline and plane table surveying which you can try out.

Tying Surveys into Ordnance Survey Mapping

With both of the above techniques, it can be useful to tie your survey into modern Ordnance Survey mapping. If you have a handheld GPS device which has reasonable accuracy, then points and/or coordinates can be taken on your survey points or at the endpoints of your baseline. A simpler method would be to survey in existing geographic features such as field boundaries, streets or buildings and to use this data such that you can overlay your survey with existing Ordnance Survey mapping.

Producing an Illustration from the Survey

There are different ways in which to create a finished illustration from your survey work. You can simply overlay the various elements of your survey and mapping and trace with ink pens, which can take a bit of time and is easy to make mistakes. An alternative is to use illustration software such as [Adobe Illustrator](#) (quite expensive but there are trial & student versions) or open-

source software (free) such as [Inkscape](https://inkscape.org/). Note that these options require a scanner for your computer.

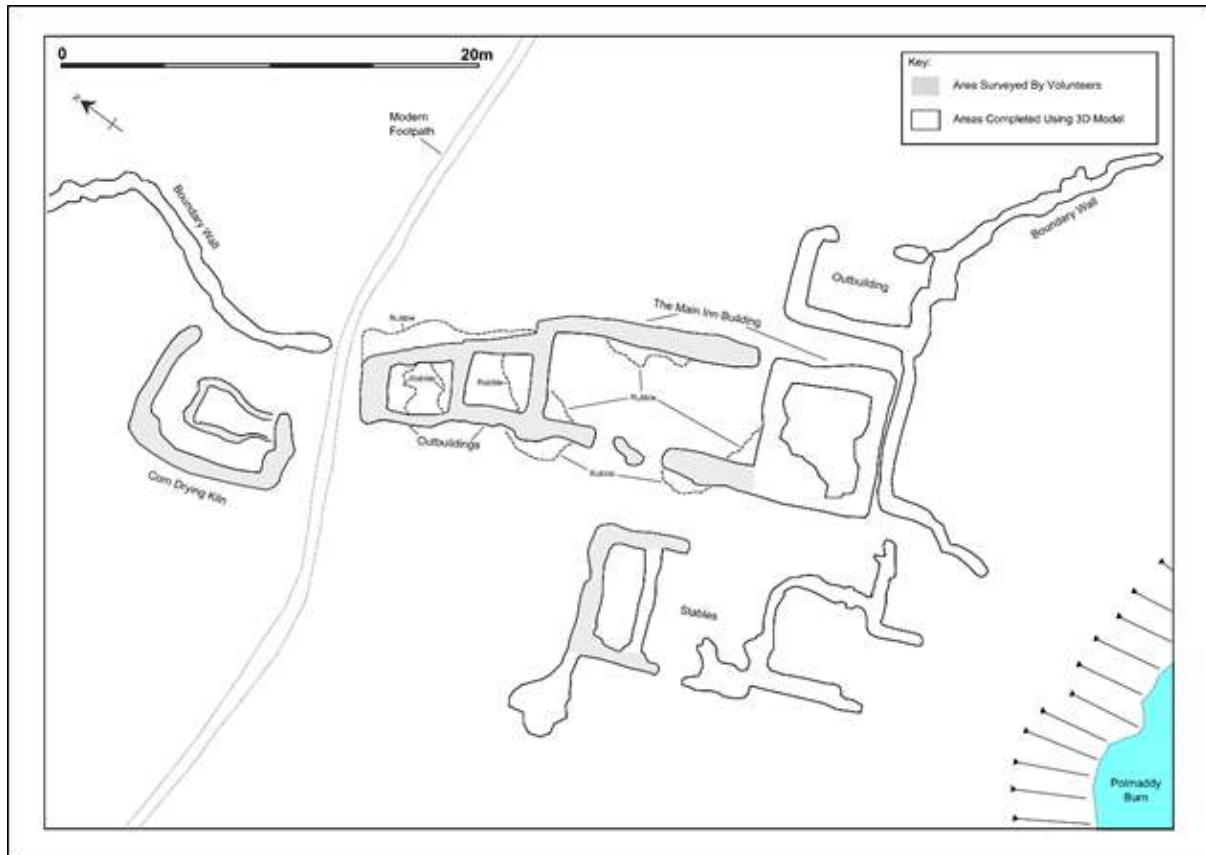


Illustration of the inn at Polmaddy from survey data using Inkscape (July 2019)

Created by Rathmell Archaeology for the Galloway Glens, December 2019.

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