

Photogrammetry and the Lopen Mosaic

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In the process of recording a mosaic, once the site has been uncovered, hopefully the finder has the presence of mind to report the find to the local county archaeologist. In the Lopen case, the mosaic was found by a man in a digger, who was excavating a drive way to a farm. He did have the sense to report the find to Bob Croft, Somerset County Council Archaeologist. He went on site to assess it's 'value' in terms of size, quality, state of preservation, and vulnerability. In so doing, he realised that it was of great importance, as it was large, several metres wide and long, the quality of the mosaic was exceptional, it was mainly intact, but it was not stable, as much of the tesserae were loose.

Bob Croft decided that he needed our assistance, to record the find as quickly and accurately as possible, so that it could then be recovered, due to it's fragility. Bob called Paul Bryan here at the Metric Survey Unit in York, and he sent our surveyor and photographer down to record it straight away.

Our process is relatively straight forward. The photographer covers the site with as many strips of photography as it takes to cover the site stereoscopically, but he does this in liason with the surveyor, as the photography must include 'control points' (to be used by the surveyor), enough in each 'stereo model', as to satisfy the photogrammetric process, which follows the photographic recording. Generally four control points are used in each stereo model. The control points are paper 'butterfly' targets, stuck to the mosaic, (they are not detrimental to the surface of the mosaic) which the surveyor 'observes', with his theodolite and takes his measurements. The photographer provides the imagery and the surveyor provides the control, which are used in conjunction, in the photogrammetric process.

The photogrammetric process is the means by which, from a representational image, we can view the mosaic once it is covered up again, to preserve it, until a decision has been made about it's future, but at the same time, allow any interested party to view it at any time and take measurements from it if necessary.

The photogrammetric process involves taking the photographs from the photographer, getting it scanned and imported onto a digital photogrammetric workstation. The 'stereo models' for viewing purposes, need the control in order to establish the precise position in 3D space, to ensure that measurement taken from the resultant imagery are accurate. once this has been achieved, then you can extract other information from the basic images. For example, digital elevation models (DEM), these give you a network or mesh of points which accurately describe the surface of the mosaic, highlighting all the undulations. This can be viewed as contours if necessary, to millimetre accuracy. From this, an 'ortho photograph' can be generated, which is an image, made from selected portions of several or all of the photographs of the mosaic, draped over their DEMs and mosaiced together, to give one image, which is dimensionally accurate i.e. you have removed scale variations across its surface. The resultant image will be colour balanced throughout, to disguise the 'seams' from one photo to the next which were used to make the ortho photo.

The ortho photograph is an ideal image from which archaeologists can work, assess and take measurement from the mosaic, without actually touching the original tesserae.

Once the photogrammetric unit have produced the final product, we send a copy to the client and archive all our data at the national archive at Swindon. The National Monument Record Centre at Swindon, (Our contact there would be Clair Anderson 01793 414 802) is the place to go for all our archived information.

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