

# WESTGATE OXFORD: DIGITAL MAPPING AND SURVEY

WESTGATE  
OXFORD



Digital mapping and survey is the process by which we record and measure the different archaeological features and structures that we uncover on site. We collect the spatial data from the excavation and then process this on a computer in order to produce maps and plans, along with building complex 2D and 3D site models. This allows us to analyse and present the archaeology in different ways, not only for our use but also to share with the engineers who are building Westgate Oxford.

To carry out this task, we employ several different types of methodology and equipment:



Our surveyors use both Global Positioning Systems (GPS) and Total Station Theodolites (TST) to accurately record our sites

## GPS and TST Surveying

GPS (Global Positioning Systems) and TST (Total Station Theodolite) machines are used to capture accurate spatial data and survey the archaeological features and structures that we investigate, which allows digital versions of the features to be created. The data obtained is downloaded and processed in order to compile a digital archive for the site, which at the Westgate are our main 2D and 3D Computer Aided Design (CAD) models. From these we produce maps and plans of the archaeology we uncover, and are able to share, compare and analyse different features on the site with other archaeologists and engineers.



## Photogrammetry

Photogrammetry is a digital recording method used on sites to produce 3D models of different structures or areas of archaeology. It works by taking a series of photographs from different angles

and points of view from around the desired area or feature to be modelled. These photos are then processed in photogrammetry software, which uses an image matching matrix and the spatial data from the photos and different camera positions to produce a 3D model.



Photogrammetry allows us to combine multiple digital photographs together to create a complete 3D model, such as this one of the Quay wall

At the Westgate site, we use a combination of handheld photogrammetry and polecam (a camera on a pole) photogrammetry to build our models. The handheld photos allow us to capture a high level of detail in specific areas, while the polecam equipment allows overview shots with a wider range and field of view to be taken, up to a height of 5m.

## Hand-Drawn Plans and Digitising

Along with surveying features on site, hand-drawn plans are also produced at varying scales, in order to record the archaeology present in a high degree of detail and produce physical archive records. These drawings record the extent, orientation and changes in depth for a feature, along with any relationships with other features. Hand-drawn plans can show details of features that are not always possible to show as effectively with survey data alone. These drawings are produced accurately using two or more drawing points (DPs), which are recorded as part of our survey. This allows the drawings to be 'digitised' in our CAD models by matching the drawn DPs to the surveyed ones, creating digital versions of the plans which add greater detail and information to the survey data.



We still rely heavily on hand-drawn interpretative plans. Every member of our staff is capable of producing detailed and accurate drawings

