

Victoria Square - Mays Bridge Excavation

"Laser scanning gives us an unsurpassed level of detail, quickly and cost effectively."
Audrey Gahan, Senior Archaeologist and Director

Scope: registered 3d point cloud of excavated bridge / walls in trenches, 3d models, scale 2d CAD section, elevations and plans

Client: Gahan & Long Archaeologists

Date: May 2004

Background: Gahan & Long Ltd, contract archaeologists for the £250m regeneration of Belfast's historic Victoria Square have been tasked with excavation and recording of archaeological structures discovered during the initial development phase. Having uncovered a section of Mays Bridge at the eastern end of the site, Gahan & Long employed Gridpoint Solutions Ltd to conduct a High Definition Survey (HDS) of the exposed structures using a Leica 2500 3d laser scanner.

Once scanning was completed, quality checked and traditional archaeological recording completed, the trench was immediately back filled causing minimum disruption to the site.

Cyclone[™] software was used to register the 11 scans together and reorient the X, Y and Z axis to the local grid system and datum. The resulting complete 3d point-cloud record of the entire trench was made available to the client for future work and archiving.

Project Facts

Field: 2 person scanner crew, 1 field day

Office: 3 Days

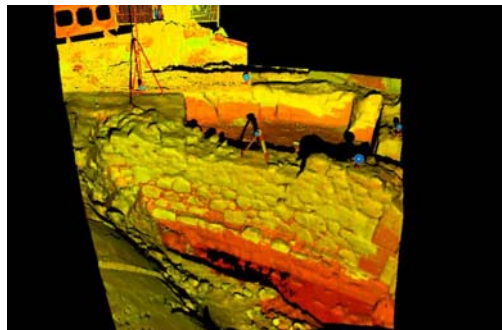
Deliverable: registered 3d point cloud, 3d rendered wall, 3d models of bridge, 2d CAD section, elevation and plan drawings.

Benefits

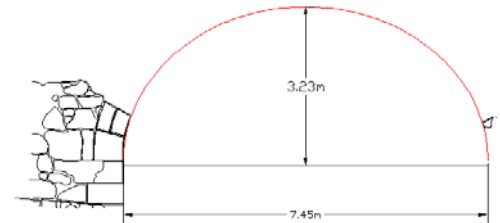
- Unique Heritage Archive
- Speed & Efficiency
- Survey quality and accuracy
- Health & Safety
- Value Added



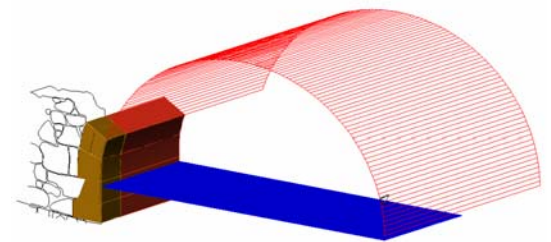
Workflow: Following an initial site inspection the excavated walls and bridge were scanned at a resolution no greater than 10mm. Multiple 3d scans were collected detailing the exposed walls and remains of the bridge. Irish grid control was attached to the 11 individual scans via a reflectorless EDM survey of in-scene targets. Having used 3d laser scanning previously on the site, the archaeologists were impressed with the speed, efficiency and unsurpassed level of detail collected and understood the benefits to the project as a whole by recording this structure in 3d.



meshed point cloud



2d CAD drawing



3D Model of Bridge

Back in the office the fully registered point cloud of the bridge was opened in CAD software using the 3d point-cloud analysis plug-in *CloudWorx*[™]. *CloudWorx*[™] tools were used to "slice" the bridge remains intelligently along the X, Y and Y axes and provide detailed section views. Standard CAD tools constructed traditional scale 2d plan and elevation drawings of the bridge cumulating in a 3d rendered reconstruction of the complete bridge.

Registering the complete scan to the Irish Grid coordinate system, Gridpoint Solutions were able to define sea level in both 2d sections and 3d models of the bridge. This allowed the archaeologists to deduce a clearance height under the bridge, estimating the size of boats that would have frequented Mays Dock.