

# Drumcullen Church - Historic Fabric Survey 2

"An extraordinary number of extremely accurate point measurements were made, enabling the generation of a complete 3D model of each site. The information used to construct the elevations, sections and plans of the sites is only a fraction of the data collected."

Dave Pollock Project Archaeologist and Director – Archaeografix

**Scope:** registered 3d point-cloud of ruined and abandoned church, 3d models, 2d AutoCAD drawings

**Client:** Archaeografix/Offaly County Council Heritage Office

**Date:** November 2003

**Background:** In November 2003 Offaly County Council Heritage Office commissioned Archaeografix to undertake a historic fabric survey of two ruined churches in County Offaly as part of a project to record and archive the ruins before the implementation of a restoration project and site heritage management plan.

The masonry ruins at Drumcullen are comprised of an upstanding gable west end and remains of vaulted church accommodation. Rubble had been previously cleared from parts of the site, allowing the full length and footprint of the church to be exposed.

Archaeografix commissioned Gridpoint Solutions Ltd to supply a 3d laser scanning High Definition Survey (HDS) of the upstanding ruins to allow the project archaeologist quick access to a complete highly accurate and detailed survey of the church, coupled with production of scale 2d section, elevation and plan drawings, and 3d rendered models of the upstanding walls.

Cyclone™ software was then used to register the nine scans together and reorientate the X, Y and Z axis to the designated local grid system. The resulting complete 3d point-cloud of the entire upstanding ruin was made available for further analysis.

## Project Facts

**Field:** 2 person scanner, survey crew, 1 field day

**Office:** 1 surveyor, 4 Days

**Deliverable:** registered 3d point-cloud, 3d rendered wall models, 2d CAD Section, elevation and plan drawings.

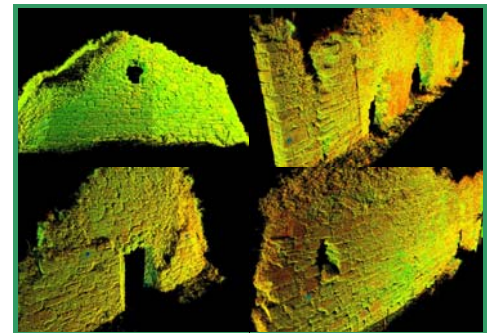
## Benefits

- Within costs/on time
- H&S – remote survey
- Survey speed
- Detail, quality and accuracy



**Workflow:** Following an initial site inspection overgrowth was cleared (where possible) by hand from the church, and the upstanding ruins were then surveyed by Gridpoint Solutions Ltd using a HDS 3d laser scanner at a scan resolution no greater than 10mm. Multiple 3d scans were collected detailing the external and internal archaeological and architectural fabric of the church. Local control was attached to the nine individual scans via a reflectorless EDM survey of HDS in-scene targets.

Scan data was viewed in real-time on the scanner laptop allowing areas of archaeological/architectural significance to be quickly identified and rescanned if required at a greater resolution.



Away from the site the fully registered point-cloud of the church was opened in AutoCAD™ using CloudWorx™, the 3d point-cloud analysis plug-in.

CloudWorx™ tools were used to "slice" the registered 3d point-cloud intelligently along the X, Y and Y axis and provide detailed 2d and 3d views of each slice directly within AutoCAD™.

AutoCAD's™ standard drafting tools (e.g. polygon tool, arch tool, spline tool, etc.) were used to trace and create sections, elevations and plans from the point-cloud slices. AutoCAD's™ dimension tools were used to extract and place dimensions on the drawings. All necessary drawings and models were delivered within one week of the completion of scanning.

Archaeografix completed the project by supplementing the detailed scan and CAD output with professional archaeological illustration, and presented Offaly County Council with a detailed, accurate, unique record and archive of the ruined Church. The complete project came in on time and on budget.



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