



This issue

Measured Building Survey as
an aid to 3D Modelling and
Right of Light Analysis

Site/Project:

Belfast City Centre
Student Accommodation
Development

Industry:

Private Development

Client:

Watkin Jones Group /
Lacuna Developments

Location:

Belfast

Site Type:

Urban Streetscape

Deliverables:

3D Laser Scan survey of
3 Block / 3.5ha Belfast City
Centre, 3D Mass building
models and window
openings

Introduction

New student accommodation development was planned for two prominent Belfast City Centre locations which would involve the renovation of an existing building at Site 1 and extension upwards to accommodate additional floor levels and the construction of a new building on Site 2. The client required a 3D survey of the surrounding 3 city blocks (c.3.5ha area) within the first development location to include all adjacent retail and office buildings, and a smaller 1 block survey (c.0.5ha area) within the second development location to include a mix of office and residential buildings to facilitate the construction of an accurate 3D model of the development building and surrounding buildings in order to carry out Right of Light Analysis as a due diligence exercise.

3D Survey

The measured building survey consisted of a 3D laser scan survey of the surrounding streetscape within both locations using a Leica Scan Station C10, carried out over a period of three days. With a 300m scanning range the C10 scanner was traversed around each of the street blocks within the survey area to allow for the capture of overlapping scans. Scans were predominantly carried out at ground level and augmented with roof level survey scans where access was made available.



Roof top scan over Belfast



Street level scan

The high data collection rates of the scanner (c.500,000 – 1mill points per sec) negated the need to close the survey area off to traffic and pedestrian access and the majority of survey was carried out during daylight hours within a busy public area. A total of 40 individual scans were carried out at a resolution of 5mm (at 100m) which included the collection of colour imaging using the on board digital camera to allow for both RGB and True Colour mapping on to the resultant point cloud.

Benefits:

- Time and cost effective survey of large city streetscape
- No need to close off street traffic
- Quick turnaround
- Unparalleled building modelling accuracy

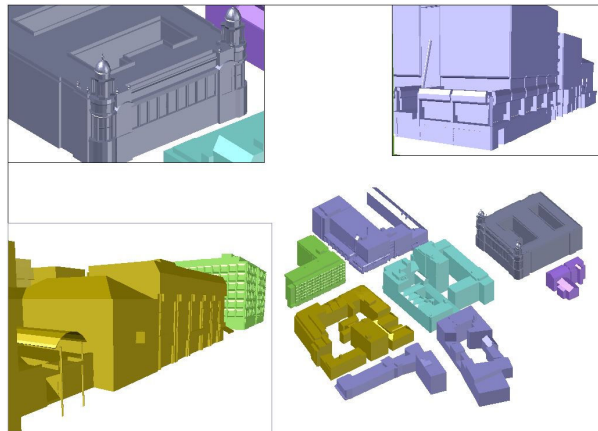
Applications:

- Accurate 3D data for modelling and integration into Right of Light modelling

- Complete measured survey archive

On site control was collected and reference to Irish Grid using a combination of RTK GPS and Total Station observations

Survey Analysis & 3D Output



3D Block Models Site 1 – Belfast City Centre

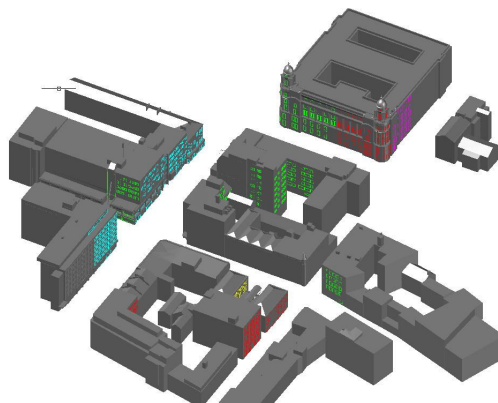
A total of 40 individual 3D point cloud scans were combined together and registered to form a completed model of both survey areas. The fully registered point clouds were exported to PTS/PTX/XYZ format for integration into 3Ds Max software for modelling purposes and imported into CAD software for production of 3D polyline window openings.

Within CAD software the point cloud data was sliced up along its X & Y Axis in order to derive the required window polylines for Site 1. Upon completion these were aligned and integrated with the full 3D mass model of the area and supplied to the client in CAD format.

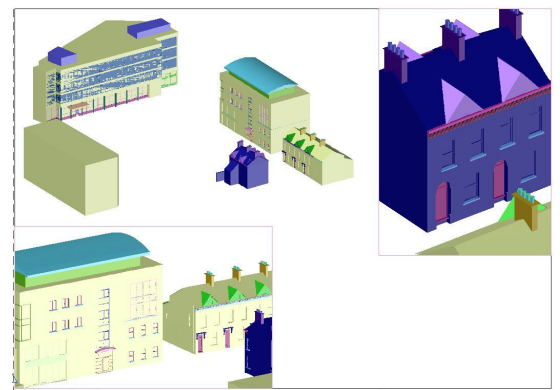


Overlay of 3D model and point cloud scan data

Deliverables included 3D mass models of all buildings within the survey area to a detail including all building façade architectural elements including window reveals, overhangs, porches, pillars etc. A 3D polyline drawing of all window openings was also required for integration into the RoL analytical software for Site 1.



3D Model Window Polyline overlay Site 1



Detailed 3D Building Modelling Site 2

The 3D mass models and associated window polylines were made available within five days of completion of on site works