Laser Scanning as a Tool to Assist Energy Savings on a Large Housing Project

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www.getlaserscanning.com
Contents

• Background to the project
• Site survey challenges
• Site survey solution
• Post processing
• Deliverables
• Final result
• Conclusions
Surveying the Properties

- Aim is to dimension the internal walls and locate the positions of openings and service outlets
- Since the homes are occupied, this is not always that simple
- The properties are old and no building has perfect geometry!
Planar View of Scan Data Upstairs
Cloud to Cloud Registration (Topcon ScanMaster)
Simple plan views
Window out data of interest > export
CAD models generated from point data > sent to manufacturing
Summary Workflow & Timings

- Visit property and scan (10-15 minutes in and out)
- Import / Archive raw data (1 minute)
- Register point cloud (c2c) (1 minute)
- Window data and export > .pts (1 minute)
- Import data of interest to AutoCAD / Revit and model (10-15 mins)
Comparison A: Exterior rear of property

Figure 6 – Pre-installation rear of property; ambient temperature 15.4°C

Figure 7 – Post-installation rear of property; ambient temperature -4.0°C; average AR01 temperature -2.5°C
<table>
<thead>
<tr>
<th>Property</th>
<th>SWI 087</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Bury</td>
</tr>
<tr>
<td>Type</td>
<td>2-storey; Mid-terrace</td>
</tr>
<tr>
<td></td>
<td>Pre-1900; stone; 104 m²</td>
</tr>
<tr>
<td>Pre and post U Value (W/m² K)</td>
<td>Pre 1.60; Post 0.22</td>
</tr>
<tr>
<td>U value improvement</td>
<td>86%</td>
</tr>
<tr>
<td>Pre and post airtightness (m³/m²/hr @ 50 pascals)</td>
<td>Pre 13.52; Post 8.81</td>
</tr>
<tr>
<td>Normalised energy saving</td>
<td>10%</td>
</tr>
<tr>
<td>Pre Av. Internal Temp.</td>
<td>17.6°C</td>
</tr>
<tr>
<td>Post Av. Internal Temp.</td>
<td>N/A¹</td>
</tr>
</tbody>
</table>
Conclusions

- Total capture of site with minimal disruption to householder
- Bonus that assets are also recorded
- Building anomalies / architectural detail is captured
- Pre-manufacturing of insulation panels is more accurate
- Site installation time / costs reduced
- Scheme offers viable solution to help make homes more energy efficient
Matilda’s Blanket

The internal walling solution that exceeds regulatory insulation standards, and reduces installation time and energy costs.

- Slimline solution
- Outstanding heat and sound insulation
- Reduces installation time and costs
- Reduces energy usage
- Green Deal Approved
- £50 Approved
- Offsite modular construction
- Pre-finished and decorated with high viability
- No plastering required
- No need to down residents
- Pre-wired electrics
- BBA Approved

Cross Section of Wall / Panels:
- Inherited wall finish
- Membrane
- Sealed void
- Membrane
- Back board
- Insulation
- Membrane
- Severe durability
- Roof liaise

The performance of the wall panel means the majority of the air in the room is reflected back into the room, rather than being sucked into the wall. The sealed void behind the panel reduces the temperature drop from inside to outside, preventing condensation from forming - both surface and interstitial.

Typical Energy Costs:
- Without Matilda’s Planet Wall Panel
- £500 Saving
- With Wall Panel
- £5000 Saving

Installation Time:
- External Cladding
- Matilda’s Planet Wall Panel
- 50% Saving on installation time

The Slimline, Space Saving Solution
- The elimination of labour intensive insulation blankets
- No home bracing, airing and condensation free.

Matilda’s Planet Wall Panel
- BBA Approved
- NPL Test
- U Values 0.28

Int. Panel Support Profile
- Forms wall in compression to create seal
- Moves with the building via dampers - no cracking.

New joist/Joist hanger
- New back-plate fitted to existing socket
- New socket, pre-wired and insulated panel
- Stop pitched plate
- Maintaining and can be extended
- Same principle applies to light fittings/switches

Existing window frame and glass

Int. Track Safeguard

New Matilda’s Planet Sil

Matilda’s Planet Walling Panel

M:E: 170863.1

Matilda’s Planet

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