

## Chances Glass Works Heritage Trust

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Fig 1: Chances Glass 7-Storey Building looking East

## Background to the support provided

Chances Glass Works Heritage Trust (CGWHT) are the custodians of the former Chances Brothers Glassworks site. Derelict since 1981 this prominent site located next to the M5 in Smethwick was once the economic heart of the region producing specialist glass products worldwide for lighthouses and instrumentation devices. CGWHT want to protect and promote the industrial and culture heritage of the site, with the long-term ambition to redevelop the site into a mixed use residential, educational and creative space for the region. After an initial site visit, it was agreed that EnTRESS would scan a portion of the 7-storey building (see image above) on site using both academic expertise within the School of Architecture and Built Environment and a state of the art FARO Focus S laser scanner.

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### EnTRESS SOLUTIONS

- Built Environment
- Laser Scanning
- BIM Development



### Chance Brothers & the CGWHT

The Chance Brothers Glassworks was established in 1824 and was famed for the production of lanterns for the first generation of modern lighthouses. CGWHT have the freehold over a proportion of the former Chance Brothers site (approx 8 acres), all buildings on site are Grade II Listed and the whole site is a Scheduled Ancient Monument (SAM).



**European Union**

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Development Fund

# What was accomplished ?

## The knowledge transfer process

The core aim of the CGWHT is to protect the industrial and cultural heritage of the site whilst bringing it back into the productive use for the community through sensitive redevelopment.

Through discussions with the company and a subsequent site visit, it was agreed EnTRESS would laser scan a portion of the 7-storey building aiding redevelopment plans and offering CGWHT opportunities to implement BIM (Building Information Modelling) processes into the future renovation project.



Fig 2: 7-Storey Building looking North

The work was undertaken by EnTRESS's Paul Boden, Technical Resource Manager for the University's School of Architecture & Built Environment, using the latest FARO laser scanning hardware and software to

capture raw scans, that were later registered to create a rendered single point cloud model.



Fig 3: Inside 7-Storey Building laser scanning

Spending a full day on site EnTRESS scanned the outside and lower internal levels of the 7-storey building. Traversing the laser scanner through the building, EnTRESS ensured that key architectural features such as windows, archways and internal pillar supports were all included within the scan, and by utilising both colour (building exterior) and black & white (building interior) data capture features ensured maximum coverage within the timeframes.

In addition to the scanning work EnTRESS offered further collaboration opportunities for the CGWHT with the University's School of Architecture & Built Environment through student engagement projects related to interior design, architecture and construction.



## What's Available

- Fully funded one to one mentoring and business support, for the development and / or adoption of environmental technologies, processes and improvements.
- Access to, and collaboration with, leading research provided through the University of Wolverhampton.
- Fully funded in-house resource efficiency audits for Black Country SMEs.
- Technical Review Workshops providing assessments on current products and associated R&D opportunities.
- Environmental Impact Challenges set by large commercial and public organisations, providing SMEs with business opportunities.
- Technology Showcases promoting the uptake of environmental innovations developed by SMEs.



# Key Outputs & Opportunities

The raw point cloud data captured during the scanning process was subsequently rendered into a special model using specialist visualisation software by EnTRESS academics. The data and subsequent model can be used by CGWHT for the activities:-

- Development of a fly through video of the building which can be used for both site promotion, as well as architectural design and development.



Fig 4: Point cloud mono data interior of 7-Storey Building

redevelopment process improving resource efficiency.

- Using the data to help with BIM processes. BIM enables multiple, virtual or more accurate models of the building are constructed, helping to support the design of the building through its development phases allowing for better analysis, control and communication. Once completed these models will contain the precise geometry and data needed to support the construction, fabrication and procurement activities through the building's lifetime.



Fig 4: Point cloud colour data for 7-Storey Building looking North

- Creation of a 3D architectural model, using the point cloud data. Developing this would allow CGWHT to gain accurate measurements of both the building façade and interior layout aiding design, and helping to provide an accurate bill of quantities for the

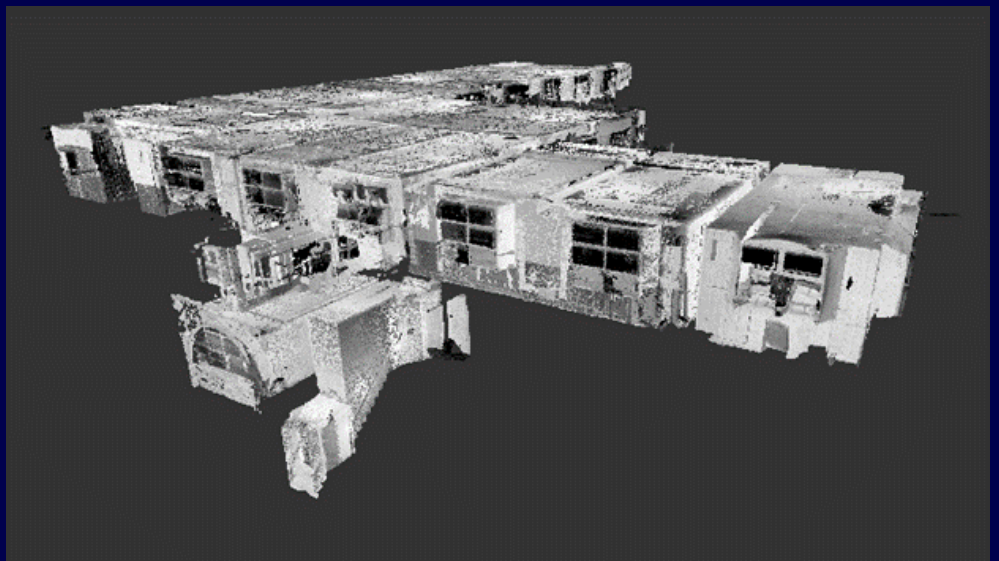


Fig 6: Point cloud mono data for interior of 7-Storey Building

## Laser Scanning

Three key benefits of laser scanning within the construction industry.

1. Speed, accuracy & consistency - a fast and accurate means of collecting millions of data points.
2. Valuable data for design— datasets are dimensionally accurate, measurable & shareable.
3. Work on retrofits and new builds - can be used for mechanical, electrical and plumbing installations, as well as complex retrofit projects.

## BIM Development

BIM has seen widespread development within the construction industry. The major catalyst for this has been the Government's April 2016 BIM Level 2 mandate, through which there is now a requirement to provide collaborative 3D BIM on centrally procured Government projects. The push from Government has meant that the value of a building no longer resides solely in the products and systems it is made of, but increasingly in the information held about it. Currently 60% of construction firms utilise BIM in one form or another, but this figure is set to increase to 95% within three years.



## What is EnTRESS?

ENTRESS is a new environmental innovation project drawing on University of Wolverhampton expertise, part funded by the European Regional Development Fund (ERDF).

### What we do?

Support for Black Country SMEs who want to modify their practices for increased sustainability.

### Eligibility Criteria:

Open to all Black Country (Sandwell, Dudley, Walsall & Wolverhampton) Small to Medium Size Enterprises (SMEs).

**EnTRESS Case Study**  
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To undertake the scanning work EnTRESS used the FARO Focus S 150 laser scanner. The scanner is certified via the industry standard Ingress Protection (IP) Rating and in Class 54 for Environmental protection enabling it to

cope with challenging scanning conditions. This portable (4.5kg) model offers ultra-high resolution measurements of both objects and buildings, with a measurement speed of 976,000 points/second, within a 0.6m—150m range and accuracy of  $\pm 1\text{mm}$ . Built in on-site compensation, integrated accessory bay, touchscreen display and HD photo overlay up to 165 megapixel colour.

## EnTRESS

**Environmental Technologies & Resource Efficiency  
Support Service**

University of Wolverhampton

Faculty of Science & Engineering. ML046, Deanery Row, Off Molineux Street. City Campus Molineux, Wolverhampton. WV1 1LY

Andrew Barnett (01902) 321595 | 07583 050885

Andrew Stott (01902) 518532 | 07583 050887

<https://www.wlv.ac.uk/EnTRESS>



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