

## Museum of Making, Silk Mill, Derby

Derby Silk Mill Industrial Museum (a Grade II listed building) was remodelled as the Museum of Making. This £17m project (grant funded by the HLF) involved the repair of the existing building, verification of its load capacity and construction of a new Atrium adjacent to the existing building.

*It received five awards at the Building Excellence Midlands Awards 2021, including Building Project of the Year and Conservation and Regeneration Award.*

The building required extensive repair and conservation, as well as sensitive alterations to the existing structure.

The new museum was intended to celebrate Derby's heritage as a city of makers through its internationally, regionally and locally significant collections.

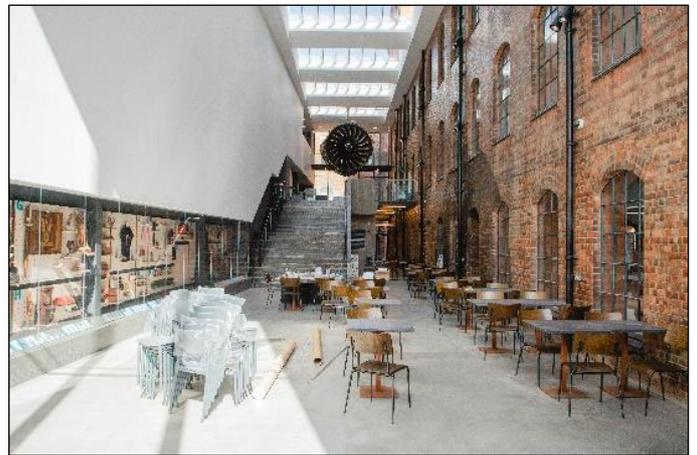
GCA were involved from the early stages of the project and worked collaboratively with the design team and contractor to come 'best for project' solutions to a range of project challenges.

Amongst several innovative design solutions used on the project, GCA developed a programme of physical investigation and load testing to enable the retention of the existing first and second floors. This saved the project approximately £100,000 and 45 tonnes of embodied carbon and allowed the retention of the historic fabric. GCA saved a further £200,000 through design of a thin profile ground floor to encapsulate existing asbestos.

GCA found creative solutions through new technology in the use of robotic wheeled drones to access the undercroft of the original Mill to enable a detailed structural inspection.

Our designs were constantly conscious of the visual impact of the existing structure. In the design of the Atrium steelwork, we installed a new truss within the existing building floor which enabled wind loads on the Atrium to be transferred to the existing building, avoiding the use of heavy cantilevered columns (and the high carbon cost of the associated substructure) or a portalised frame which would have disrupted the rhythm of the existing listed building façade.

Our attention to aesthetic sense and detail retained large elements of structure on show, for example the new wind truss to the second floor was left uncovered by the Architect once installed as an exemplar within the Museum of real world 'Making'.



## Aqueduct Cottage, Cromford Canal, Cromford

In 2019, GCA were requested to carry out a full structural assessment of a pair of derelict Canal Workers Cottages at Cromford, part of the Derwent Valley World Heritage Site.

GCA made an assessment of the existing condition and developed a program of repair works for the project.



The repairs included the structural design of a new timber truss and purlins to allow for replacement of the roof structure as part of the restoration to the Grade II listed building.

With its historic links to Florence Nightingale, GCA were delighted to be able to work alongside DerwentWISE and Derbyshire Wildlife Trust to bring a once loved family cottage back to a sounds and habitable condition..

## Sudbury Farm Buildings, repair and conversion.

GCA were requested to carry out a full structural assessment of a range of derelict farm buildings on the Sudbury Estate in Derbyshire.

These were in a dilapidated condition with extensive rot of timber roof structures and instability of masonry walls.



GCA developed a schedule of repairs, and agreed prioritization of these with the client.

The buildings were restored successfully and economically, and returned to good condition.

The site has developed into a collection of shops and cafes which ensure the buildings have a sustainable economic future to maintain repairs.

## Grand Egyptian Museum, Cairo

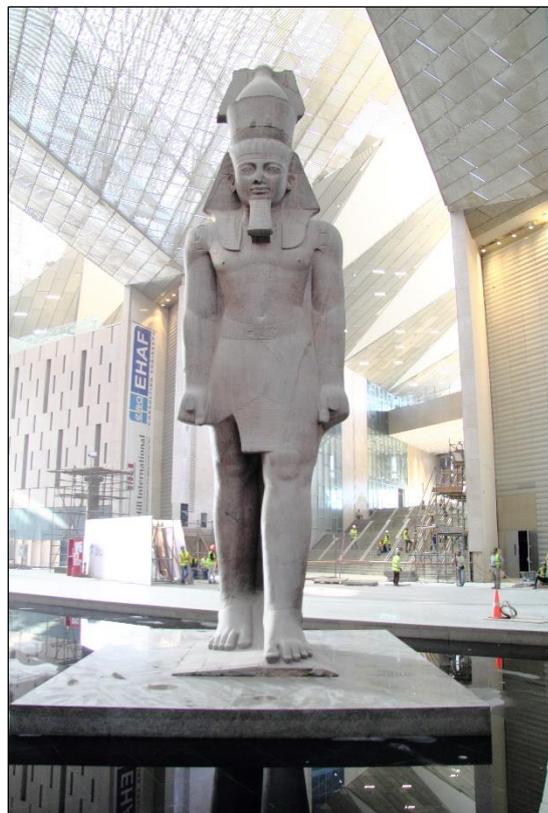
Between 2018 and 2021, GCA undertook a series of projects in collaboration with Hayley Sharp Design to provide a structural strategy, concept and implementation for the support of a wide range of artifacts at the £1bn Grand Egyptian Museum in Cairo.

Our brief was to ensure the safe support and integration of structural systems to resist seismic, accidental, live and dead loads from a group of over 20,000 objects.

GCA worked closely with designers, fabricators and curators to ensure objects were presented securely and safely, within the confines of a building which was under construction.

Through detailed and rigorous analysis, we reduced a vast range of potential load configurations to a manageable and calculatable set of cases.

These were then provided with full, detailed design to provide proposals for fabrication.



## Wirksworth Heritage Centre, Wirksworth

The Wirksworth Heritage Centre in Derbyshire were gifted a three-storey townhouse and shop, and through Heritage Lottery grant funding had developed a proposal to convert it into a £2m local heritage museum.

The building was Grade II listed, with the main features of historic interest were located at the front of the building.

The Architect's proposals required extensive remodelling of the building, the introduction of a lift, and the removal of internal cross-walls, along with a new rear extension.

GCA supported the project from the very start, beginning with a structural appraisal of the existing structure, and working through to completion of construction.

We used our engineering experience and expertise to confirm that the existing historic fabric was structurally adequate, avoiding the carbon footprint of reconstruction even where they were not compliant with modern codes.



## The Green Man Hotel, Ashbourne

GCA have been involved with the development of the Green Man Hotel complex, including a hotel, restaurant, bistro, and retail accommodation since 2014, supporting the project in a number of phases.

The project required the sensitive conversion of 18<sup>th</sup> century structures, as well as new contemporary buildings on the site.

Through a number of phases, GCA developed practical solutions to conservation engineering challenges, resulting in cost-effective engineering works that enabled significant redevelopment and remodelling of a complex group of buildings around a central courtyard.

At each stages we have balanced careful intervention and sensitive additions with compliance with building regulations and the associated robustness.



## Stewartby Brickworks

Between 2018 and 2021, GCA were requested to carry out an independent structural assessment of a group of listed chimneys as Stewartby Brickworks.

Our role was to assess supporting evidence relating to an Application for Listed Building Consent for demolition of the four listed chimneys.



We were able to mediate between all parties, request additional technical information from specialists and provide succinct reports to enable high-level decision-making by all parties.

The project was locally contentious and required fair and impartial advice to be provided during meetings which could often involve heated discussion between various parties.

## St Bartholemews Church, Foston

GCA were requested to carry out a full structural assessment of St Bartholemews Church in Foston, to mediate between Historic England and the client's Structural Engineer.

The East gable was leaning excessively with (at the onset of our appointment), no clear cause. Our brief was to advise all parties on the present condition.



GCA identified the most likely cause of movement, proposed appropriate remedial works and then supervised the installation of remedial ties.

We obtained full approval from Heritage England within the client's budget, reducing the potentially overall project spend significantly during the course of our involvement with the building.

## Tramway Bridges, Froghall, Staffordshire

GCA were invited to undertake a geometrical and condition survey of the two aged stone masonry bridges, to make appropriate recommendations for their sensitive conservation repair.

The client had previously identified that part of these structures appeared unsafe, but the structural appraisal confirmed there was no immediate danger of catastrophic failure or risk of collapse. GCA were asked to prepare a sympathetic but urgent repair scheme to make the structures safe and avert any danger to the public who may come across them.

During the repair works new stone was sourced from local quarries, transportation of which had to be considered due to the location and terrain of the site.

