# Plowman Craven



# **Delivering at former Gasworks sites**

**Clients: Argent & Ballymore Group** 

# WHAT'S THE STORY?

As a survey company with more than 50 years' experience, we have worked closely with developers, engineers, architects and project managers on a number of challenging sites where gasholders and industrial infrastructure are present.

Our ability to provide the full measurement remit right through the development and construction lifecycle has made us a key part of some of the largest urban regeneration schemes in the UK, including Brent Cross, Clapham Park, Croydon, Earls Court and King's Cross.

### Measuring & Modelling Gasworks - What we offer

Disused gasworks sites provide various challenges from an inspection and survey standpoint. Many of the existing structures are listed and consequently require detailed surveying to satisfy heritage requirements. With the unique, complex geometry of the gas holders and surrounding structures, traditional surveying lacks the capability to capture much of the information a developer requires to accurately assess and develop detailed design proposals.

Plowman Craven has successfully provided accurate 3D data to numerous high-profile gasworks sites in recent years, helping planning and design teams to successfully progress these schemes. Utilising a combination of bespoke technologies developed in-house, informed and accurate 3D information of all geometry can be provided, de-risking what would otherwise be a slow process.

### **KEY SERVICES**

- High-accuracy UAV surveying, sub-5mm data
- All aspects of gas holders & surrounding structures
- 3D modelling and BIM-ready models of complex geometry
- Schedule of condition
- Structural & environmental monitoring through construction and disassembly phases
- Topographical surveys
- Underground utilities mapping of all buried services

# AT A GLANCE:

- Significant experience of gasworks & brownfield sites
- Bespoke solutions for precision surveying & measurement
- Latest data capture, processing & modelling technologies
- Environmental assessment services to support geospatial deliveries
- Dedicated project manager providing single point of contact
- Delivery of comprehensive data set for informed decision-making



UAVs are used to capture survey-grade data

### **Bird's Eye View**

Our unique Vogel R3D survey system is able to reach even the most inaccessible areas of a site, using a state-of the-art drone and 100MP camera to capture data to a verified sub-5mm accuracy, as well as high-resolution imagery.

As one of the few companies in the UK to have Operational Safety Case (OSC) approval from the Civil Aviation Authority (CAA), we are authorised to fly in even the most congested areas of Central London, making Vogel perfect for large scale urban regeneration projects.

ARGENT



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# CASE STUDY

### **Kings Cross Central**

We've been primary survey contractor since 2002, working across all aspects of this 67-acre site. One of the most complex parts of the project was the measuring and modelling of the iconic Victorian gasholders, originally for heritage purposes. Constructed in the 1860s, gasholders 8, 10, 11 and 12 have now been dismantled, restored and moved to the north side of Regents Canal.

Gasholder 8 now houses a small park and event space, while the other three – known as the Triplets – have been joined together to form an outer shell for a striking, high-end residential development that also features leisure and retail space.

### **3D BIM models created**

A decade ago, at the outset of this ambitious project, we created highly-detailed models in AutoCAD for setting out. This delivered elevations and sections of the elaborate wrought-iron columns and lattice work, as well as the points needed for setting out. Working closely with the master planners and design team we also created a 3D model of the famous gasholders.

When the time came to rebuild the gasholders as a key element of the development, the engineers were unable to put them back together because of the amount of warping in the columns. We were asked to look back into our legacy model to extract exact coordinates to enable the rebuild.





### AT A GLANCE:

- Client: Argent
- Elevations, sections and points delivered
- Creation of 3D model of 'triplets' gasholders
- Area measurement of apartments inside gasholders

### Area Measurement

Once that was completed, our Property Management team was required to carry out a number of area measurement surveys to provide the internal measurements to the client, first as a desktop exercise in 2015, and then by physically measuring every single apartment unit to facilitate comparison of plans vs as-built.

The delivered report supplied Argent with: GIA, NIA with ITZA zoning of retail areas; GIA and NIA of leisure areas; NAS of residential areas; GEA of all three buildings.



Finished development at Gasholders London

With its unique, complex geometry and high-levels of fit-out, the standard methods of data collection were not viable.

As such it was necessary to undertake the majority of the work using precision survey equipment – namely a total station and then supplementing with additional measurements from a handheld laser measuring device, rather than using a laser-disto.

With 145 apartments each taking a minimum of an hour to observe this was a challenging process for the team but as we progressed through the buildings, the knowledge developed and our operational capacity increased.

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## CASE STUDY

### **Canal Way, Kensal Rise**

Another large-scale urban regeneration project in London, our work at Canal Way again required the measurement and modelling of a sprawling, multi-use site. Located in Kensal Rise, near Ladbroke Grove, the Canal Way re-development saw us commissioned by Ballymore Group to provide a range of services for a site that included two historic gasholders.

### UAV data capture of complex site

With rail, road, canal, retail, industrial and gasometers to contend with, capturing high-accuracy survey data at such as complex site was a real challenge. Using our UAV (or drone) was the obvious solution, with data-rich point clouds being generated from hundreds of overlapping high-resolution images of an area. With our experience and expertise in this area we were able to produce point-cloud data within the same tolerances as traditional laser scanning.

### Bespoke flight plans for gasholder

The complexity of the gasholder, coupled with its 40m height, required a bespoke flight plan to ensure that every surface of the latticework was captured, adjoining Network Rail and National Grid assets weren't overflown, and that in the event of an emergency, the UAV's 'return-to-home' function would avoid the structure. Careful planning of all operational elements ensured the successful completion of what was a very challenging project.



UAV imagery of site

### Modelling of building masses

In line with BIM level 2 standards, we use volume strategies to enable a phased delivery of the survey and model data. As a market leader in the provision of BIM-ready, intelligent, parametric survey models, we offer far more than simply a dimensional and spatial representation of the site - all of our models are compliant with BS1192-2 file-naming protocol, B8541 object-naming protocol with the inclusion of both Uniclass1.4 and Uniclass2015 classification systems.

### Underground utilities survey & 3D topography

Our in-house utility tracing team utilises the latest in service tracing technology, including IDS Duo GPR units and RD 8000 units. This was particularly useful at Canal Way where a utility tracing survey was required for the entire site. This was achieved by combining data sourced from these tools with manhole inspections and service records to produce high quality service surveys. All utility and topographic works were fully coordinated, with 3D and Revit deliverables also available.

### AT A GLANCE:

- Client: Ballymore Group
- High-accuracy UAV survey to capture data
- BIM modelling to Level 2 standards
- Underground utility tracing across entire site



Survey Extents



Revit Model of Canal Way site

#### About Plowman Craven

Plowman Craven provides integrated measurement and consultancy services to the property and infrastructure markets, pioneering the use of technical innovation to deliver proven expertise and trusted results throughout the project lifecycle.

#### **Head Office**

Plowman Craven House 2 Lea Business Park, Lower Luton Rd Harpenden, Herts. AL5 5EQ Tel: +44 (0)1582 765566 London Office 115 Southwark Bridge Rd London SE1 0AX Tel: +44 (0)20 7490 7700

Email: post@plowmancraven.co.uk

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