



## COMPLEX CHALLENGES ... MADE SIMPLE

RoC Consulting is a highly experienced and qualified team of civil, structural, geotechnical & geo-environmental engineers

CASE  
STUDY

# CLIFTON BUSINESS PARK, SALFORD

## Key facts

**Project**  
Clifton Business Park, Salford

**Client**  
Hampstead Land Ltd

**Project duration**  
2014 - Ongoing



Earth Sciences

## RESIDENTIAL SECTOR

### PROJECT OVERVIEW

Clifton Business Park currently comprises a collection of commercial office buildings and a laboratory facility.

The site was being promoted for residential development and required a geo-environmental assessment to support planning and feasibility assessments.

A desktop study was undertaken to provide a preliminary assessment of the site, during which the presence of numerous potentially contaminative features were identified. These included a large infilled river valley, effluent treatment plant, various product storage tanks associated with a former chemical works operation, and a backfilled railway cutting.

A site investigation was designed following preparation of a desk based assessment, during which the spatial extent of infilled features were delineated and historic sources of contamination assessed.

The works identified up to 14m of colliery fill within the infilled railway cutting and valley feature and an assessment of risks posed by spontaneous combustion was therefore necessary.

## CHALLENGES

The spatial extent of infilled land was central to the site investigation works and a detailed understanding of the location of these features relative to contemporary map records were required in order to locate boreholes.

Historic map records were imported into CAD suites so that the valley and railway cutting features could be located on site, thus facilitating site investigation design and borehole placement. The results from the site investigation confirmed the boundary of features determined from the Phase 1 Study. This allowed the implications for the proposed development plan to be assessed.

Site investigation completed across the remainder of the site supported the identification of contamination hot spots and wider geotechnical considerations allowing the early identification of abnormal items and determination of foundation typeology.

## ADDED VALUE

Working in conjunction with remedial contractors, the findings from the site investigation works informed potential abnormal costs associated with the site's development, for the purpose of assessing the land value.





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# CASE STUDY

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- Legend**
- |   |  |
|---|--|
| Site boundary   | Public right of way  |
| Extent of former landfill area  | Extent of former landfill area part 2  |
| 600mm Capping Where Landfill Waste Is Encountered (10m Buffer)                        | Potential location surface water attenuation outflow to brook (15km <sup>3</sup> required on site) |
| Indicates Gas Protection Measures Will Be Required In Any New Structures (50m buffer) | Telecoms   |
| Power lines (1m - 30 Easement)  | Water Main   |
| Power lines underground   | Approximate Downward Topographical Slope   |
| Gas Main  | Flood Zone 3   |
| Approx line of culvert (0m Easement from centreline)                                  | Broad-leaved tree with bat potential   |
| Sewer (4m-6m Easement)  | Native species-rich defunct hedge  |
| Flood Zone 2  | Native species-rich hedge and trees  |
| Scattered broad-leaved trees  | Dry ditch  |
| Native species-rich intact hedge  | Potential roundabout for site access   |
| Species-poor defunct hedge  |  |
| Species-poor hedge and trees  |  |
| Swamp   |  |



# LEIGHTON GREEN, CREWE

## Key facts

### Project

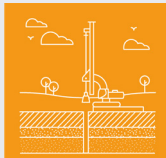
Leighton Green

### Client

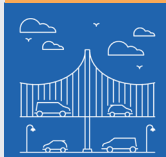
Engine of the North

### Project duration

2014- Ongoing



Earth Sciences



Civil Engineering

## RESIDENTIAL & COMMERCIAL SECTOR

### PROJECT OVERVIEW

As a key element in promoting this 40ha site for residential and commercial development, RoC Consulting was retained to undertake a contaminated land assessment and flood risk assessment of the site to support an outline planning application.

The subject site, located on the outskirts of Crewe, East Cheshire, comprised of open farmland and the former Pym's Lane domestic wastefill facility.

The masterplan for the site showed the residential development in close proximity to Pym's Lane and thus a critical feature of our investigation was ground gas monitoring, and of particular importance was the delineation of the extent of ground gas migration from the landfill.

A plan of investigation was developed to address this aspect of site redevelopment, and we utilised trial trenching to determine the true edge of the landfill and an array of boreholes and gas monitoring standpipes, so that the gas migration profile could be determined.

The investigation mapped the ground gas migration extents utilising GPS surveying of the monitoring points and this survey was overlain on the masterplan, we were therefore able to determine the zone and specification of gas protection measures required.

As the site was classified as "greenfield" by the lead authority, Cheshire East Council, restrictive surface water discharge rates were applied with respect to outfall into the watercourse which crosses the site. This ordinarily would have resulted in significant attenuation volumes being provided within the site boundary.

### CHALLENGES

RoC Consulting devised a surface water strategy utilising a SUDS solution, coordinated with the master planning team and the required volume of attenuation was accommodated in onsite retention ponds. However, the challenge was to provide attenuation through onsite ponds whilst not falling foul of the Reservoirs Act. We therefore designed a network of sub-structures, linked with more traditional oversized pipes and geo-tanks. The design also had to address the presence of soil contamination derived from the former landfill and mobilisation of contamination into the watercourse.

The brief required to accommodate outflows from a further adjoining potential development site to the north of the subject site, which would otherwise be "landlocked" from a servicing perspective.

### ADDED VALUE

Delineation of gas migration helped identify and mitigate the extent of abnormal site development costs with regard to gas protection measures.

The refined drainage strategy utilised a hybrid solution by integrating SUDS drainage, and conventional attenuation with the landscaping scheme, thereby reducing below ground attenuation volumes, consistent with achieving the required discharge rate by Cheshire East Drainage Authority.







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# CASE STUDY



# HORWICH LOCOMOTIVE WORKS, BOLTON

## Key facts

**Project**  
Horwich Locomotive Works  
(Rivington Chase) Bolton

**Client**  
Horwich Vision

**Project duration**  
2009 - Ongoing

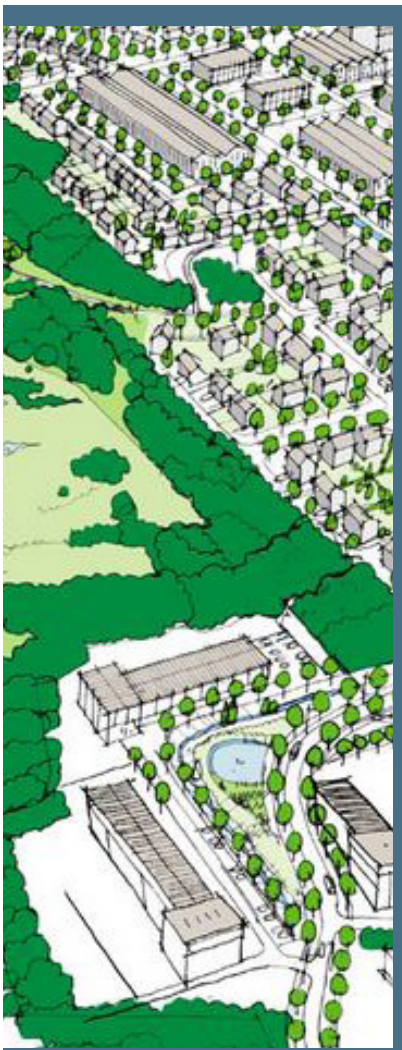
**Value**  
£260m



Earth Sciences



Civil Engineering



## RESIDENTIAL SECTOR

### PROJECT OVERVIEW

Located on the former Horwich Locomotive works, and covering an area in excess of 80ha, the Rivington Chase development is one of the largest brownfield regeneration schemes in the North West.

With proposals to build over 1,600 homes, with associated roads, infrastructure, drainage and public realm requirements, this £260m development forms a key part of Bolton Council's core strategy for housing provision in the borough for the next 10 to 15 years.

RoC Consulting has been engaged on the project since 2009, initially providing constraints and high level constraints input into the site's master planning process. More recently we have undertaken a site wide ground investigation to establish baseline conditions as well as targetting contamination sources. In addition we have been engaged to support submission of an Outline Planning application for the development including EIA technical input.

### CHALLENGES

The site has been subject to over 130 years of industrial activity with numerous sources of contamination including landfill sites containing asbestos, residual hydrocarbons, and PCB contamination and ground gas ingress from the nearby SSSI Red Moss peat bog.

Whilst a detailed contaminated land assessment was completed as part of our study, there was also a need to provide meaningful design

information to all stakeholders at an early stage of the project to inform future master planning decisions. By working in close liaison with the design team we were able to inform potential abnormal costs and advise on future development layout plans, to minimise the volume of material to be excavated and carted offsite.

In conjunction with the geotechnical investigation works a site wide cut and fill exercise was also undertaken using 3D modelling software PDS Volumetrics. This exercise was undertaken to enable feasibility study of developable areas to be undertaken as well as the detailed design of a 35,000m<sup>3</sup> drainage pond and 15m high road embankment.

### ADDED VALUE

By adopting a holistic approach to the investigation and assessment we have been able to provide critical design information across the site that has aided the ongoing design process and project feasibility.

A cut / fill exercise finalised the completion of the first stage of the site investigation works, thereby facilitating a preliminary cost estimate of abnormal and site infrastructure costs to inform financial development appraisal models.







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OVER  
SIGHT



# AIRPORT CITY CBD, MANCHESTER

## Key facts

**Project**  
Airport City,  
CBD Baseline study

**Client**  
Airport City  
Partnership

**Value**  
£650m Master plan

**Project duration**  
2014 - ongoing



Earth Sciences



Civil Engineering



Structural Engineering

## MASTER PLAN / MIXED USE SECTOR

### PROJECT OVERVIEW

Working on behalf of the Airport City Partnerships Limited, RoC completed a programme site investigation across the proposed Central Business District development to support completion of the wider master planning and baseline assessment for the site's development. These works included the completion of an array of 16 boreholes to establish ground conditions beneath the site and infill data gaps from previous site investigations and appraise an existing drainage network via a CCTV survey.

The proposed development includes the construction of a significant retaining wall along the existing World Way embankment. The site investigations undertaken established geotechnical design parameters for the retaining structure and building foundations.

The CCTV information was used to inform the drainage strategy for the site, the impact of the proposed development on the existing network, and whether the network served any developments beyond the proposed development airport city boundary.

### CHALLENGES

The site investigation works were completed within a busy live car park environment, and adjacent to the World Way highway, and required a proactive approach to coordination and liaison with site users and stakeholders.

Intensive project management of the investigation and drilling contractors was essential to ensure their smooth completion of minimal disruption to car park users.

### ADDED VALUE

Working in conjunction with the wider design team, and particularly the master planning architects, we were able to advise on ground related considerations so that adequate provision was made within the design to cover potential abnormal items. This included an assessment of the most cost effective foundation solution for the building foundations to the development and retaining wall structures.

Information provided by the CCTV survey confirmed the existing outfall and that the existing network served developments beyond the site boundary.

The high level drainage strategy developed for the ACN site, included partial diversion of the existing watercourse and envisaged the phased provision of attenuation on a plot by plot basis, as the most viable site wide development solution.



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# CASE STUDY



# AIRPORT CITY NORTH & SOUTH, MANCHESTER

## Key facts

**Project**  
Airport City,  
North & South

**Client**  
Airport City  
Partnership

**Value**  
£650m Master plan

**Project duration**  
2014 - ongoing



Civil Engineering



Structural Engineering



Earth Sciences

## MIXED USE SECTOR

### PROJECT OVERVIEW

In 2011 Manchester Airport City was declared an Enterprise Zone by the UK Government which will see businesses locating here being offered business rate discounts of up to £275,000, enhanced capital allowance on plant and machinery, super fast broadband and simplified local authority planning.

Airport City's 5 million square foot of development will include offices, hotels, logistics, warehousing and advanced manufacturing.

RoC Consulting was appointed by Airport City Partnerships to support the development frame work with provision of civil, structural, geotechnical and environmental engineering on both Airport City North and South.

Following a data gap assessment of technical information, we developed technical masterplan criteria so that a comprehensive site constraints study could be undertaken on both Airport City North and Airport City South sites. This has involved detailed geotechnical site investigation and flood risk assessments, and development of drainage strategies.

Whilst a number of detailed feasibility studies have been undertaken for office and car park development on the Central Business District (CBD) adjacent to the Worldway, a 120,000 ft<sup>2</sup> unit has been designed and built on Airport City South.

### CHALLENGES

Masterplanning and feasibility studies of the CBD, has included developing specialist foundation solutions for proposed buildings adjacent to the Metrolink route and the negotiation of critical infrastructure build over agreements.

### ADDED VALUE

A site wide holistic approach has been taken on both Airport City North and Airport City South in order to optimise plot levels so as to accommodate high level drainage strategy and recognising ground conditions achieved, and where required a cut and fill balance.











