

# COGNITION

S O L U T I O N S F O R A C O M P L E X W O R L D

A NET ZERO CARBON COMPANY



# INTRODUCTION



As one of the most dynamic contractors in the industry, Cognition Land and Water has an outstanding track record for delivering projects on time and on budget. Sustainability and a Zero Carbon approach are always at the core of our values.

As a forward-thinking business, we constantly evaluate new technologies and techniques and our staff training and continuous development reflect this. We are able to draw on our in-house knowledge and expertise in carrying out our work, controlling and coordinating the process under a prescribed project management structure.



In October 2021, the shares in Cognition Land and Water was transferred to the EOT (Employee Ownership Trust), providing indirect employee ownership of the company for the benefit of all employees.

*“Due to the efforts of the team and in particular your Cognition Team here on site we scored 100% with a Gold Rating...your people are going over and above and I cannot fault anything you are doing on site”.*

**Peter Trainer,  
Vistry Group**

Cognition Land and Water is one of the UK’s leading specialist remediation and ground engineering contractors. We have an extensive portfolio of completed projects across many sectors including Residential, Commercial, Industrial, Infrastructure and specialist sectors such as Nuclear. We specialise in delivering solutions to ground-based risks on challenging and complex sites such as landfills, industrial land and radiological facilities, we work directly with developer clients or through government bodies, Tier 1 contractors or consultants/designers.

Cognition Land and Water has grown organically since its establishment in 2005 by our Managing Director, Richard Hosking. The company began as a specialist Land Remediation Contractor. As a result of continued growth, client recognition and reputation, we are able to adapt our offering to our clients’ requirements and provide tailor made solutions for each project.



*“The company and staff were extremely professional and knowledgeable... We would certainly consider Cognition for future remediation and groundwork projects. We were very pleased with the overall outcome of what on the face of it was a difficult project with lots of potential pitfalls.”*

**James Belbin, Hanbury Properties**



# OUR APPROACH

COGNITION

**COGNITION LAND AND WATER IS A MULTIDISCIPLINED SPECIALIST CONTRACTOR, SUCCESSFULLY DELIVERING ALL BELOW-GROUND ASPECTS OF SITE REDEVELOPMENT FROM SITE INVESTIGATIONS, REMEDIATION, GROUND ENGINEERING AND EARTHWORKS, THROUGH TO COMPLETION OF GROUNDWORKS.**



## INNOVATIVE

Our wealth of experience along with our community of engineers, geologists, scientists, environmentalists and project managers gives us the expertise to solve the most challenging ground-related issues. We have developed and promoted novel and innovative technologies, many of which have now become commonplace in the industry with other contractors following our lead. These include soil stabilisation using cementitious binders to improve road formations and construct pile mats; our FabEx system for efficient removal of NAPL from groundwater; and the development of specialist, aggressive bacteria for more effective bio-remediation. We develop solutions on a case by case basis, using our in-house talents to arrive at the most effective results for our clients.



## CAN DO

Our team is friendly, approachable and flexible; we work as a team with clients and their advisors. We always aim to exceed client expectations and, as a result, much of our work is through repeat business having built strong relationships with a number of clients over many years. *"Your people are going above and beyond, and I cannot fault anything you are doing on site."* (Peter Trainer, Vistry Group).



## EFFICIENT

We deliver our projects on time and to budget. In many instances, through our novel and innovative approach to problem solving, we identify significant cost and programme savings, whilst always keeping focused on sustainable solutions by reducing soil disposal, maximising onsite reuse and adopting energy-efficient processes.



## PROFESSIONALISM

Our team's professionalism, dedication and pride are at the root of what we do. Our intelligent approach to problem solving, with a focus on safety and sustainability, ensures that projects are delivered safely, sustainably and in a timely and cost-effective manner. The wealth of experience within our team enables us to train and develop our up-and-coming specialists ensuring they have an abundance of opportunities within our growing company.

*"The company and staff were extremely professional and knowledgeable... We would certainly consider Cognition for future remediation and groundwork projects. We were very pleased with the overall outcome of what on the face of it was a difficult project with lots of potential pitfalls."*

James Belbin, Hanbury Properties

# WHAT WE DO



We offer our clients a 'one-stop-shop', providing a wide range of services from remediation, earthworks and groundworks through to infrastructure, civils and structure construction. We have the necessary skills and experience to solve your ground engineering challenges and we offer innovative solutions to save time and money.



REMEDIATION



CIVIL ENGINEERING



PROJECT  
MANAGEMENT



DECOMMISSIONING



ENVIRONMENTAL



NUCLEAR

# REMEDIATION



REMEDIATION



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# REMEDIATION

As one of the UK's leading remediation contractors, Cognition Land and Water offers a wide range of specialist remediation processes and technologies to address ground and groundwater contamination and derisk our client's sites. Below is a selection of the main weapons in our remediation armoury but we are constantly expanding and improving our approach as we adopt novel and innovative techniques.

## GROUND WATER TREATMENT

Apart from being a requirement for regulatory compliance and environmental protection, the treatment of groundwater is very often an integral part of the remediation and regeneration of brownfield land. Cognition Land and Water has many years of experience and innovation in this field and we have developed our in-house capability, resources and expertise to include a wide range of processes and technologies for the treatment and recharge/ discharge/ disposal of groundwater, surface water and tank contents. These include:

- Unique FabEx NAPL/ oil removal system
- Pump and treat
- Insitu treatment
- Extraction, treatment and disposal
- Chemical oxidation
- Air Sparging
- Vapour extraction
- Suspended solids control



## PFAS TREATMENT

PFAS (per and poly-fluorinated alkylated substances) are a group of man-made chemicals used in many industrial and consumer products such as carpeting, clothing, fire-fighting foams, cooking pans, etc. because of their resistance to water, oil and heat.

These chemicals are highly persistent, very mobile in soil and groundwater, and resist degradation in the environment. They bioaccumulate and PFOA - one of the primary compounds within the PFAS group - is believed to be in the blood of virtually every living creature on the planet including 99% of humans. These 'forever chemicals' have been linked to numerous adverse health effects.

At Cognition Land and Water, we have been closely monitoring the progress of knowledge around these new and emerging chemicals and have been actively involved in the design and implementation of remediation strategies for a number of key sites including former airfields and firefighting facilities.

We are partnering with the Australian developer of a novel and innovative water treatment process that removes all detectable traces of PFAS from affected water at high throughput rates, at low cost and without the need for costly reagents, catalysts or filters.

In our aim to be at the forefront of our industry, Cognition is actively funding the production of CIRIA best practice guidance on the assessment and remediation of PFAS impacts as well as being a member of the Project Steering Group.



## PERMEABLE REACTIVE BARRIERS

A Permeable Reactive Barrier (PRB) is a treatment zone of reactive material that is built below ground to clean-up polluted groundwater. The reactive zone may be installed as a below-ground wall to intercept a migrating plume of contaminated groundwater. Alternatively, the contamination can be funnelled by low permeability barriers (e.g., slurry walls) to a gate or vessel containing the reactive media - the funnel and gate method. The reactive media is selected to absorb or adsorb the pollutants from the groundwater or to convert harmful chemicals to harmless by-products.

Cleaning groundwater with a PRB may take many years as the time taken depends on the amount of pollution present and how fast the groundwater moves through the PRB. Despite this, there are several advantages of using a PRB to remediate contaminated groundwater:

- **The installation is beneath ground preventing human contact with the contamination**
- **Low operating and maintenance costs**
- **No energy requirement as the system relies on natural groundwater flows**
- **No pumps, moving parts or associated noise**
- **Invisible after installation**
- **Allows continued use of the site after installation**

*Cognition Land and Water has successfully installed PRBs at more than one hundred sites.*



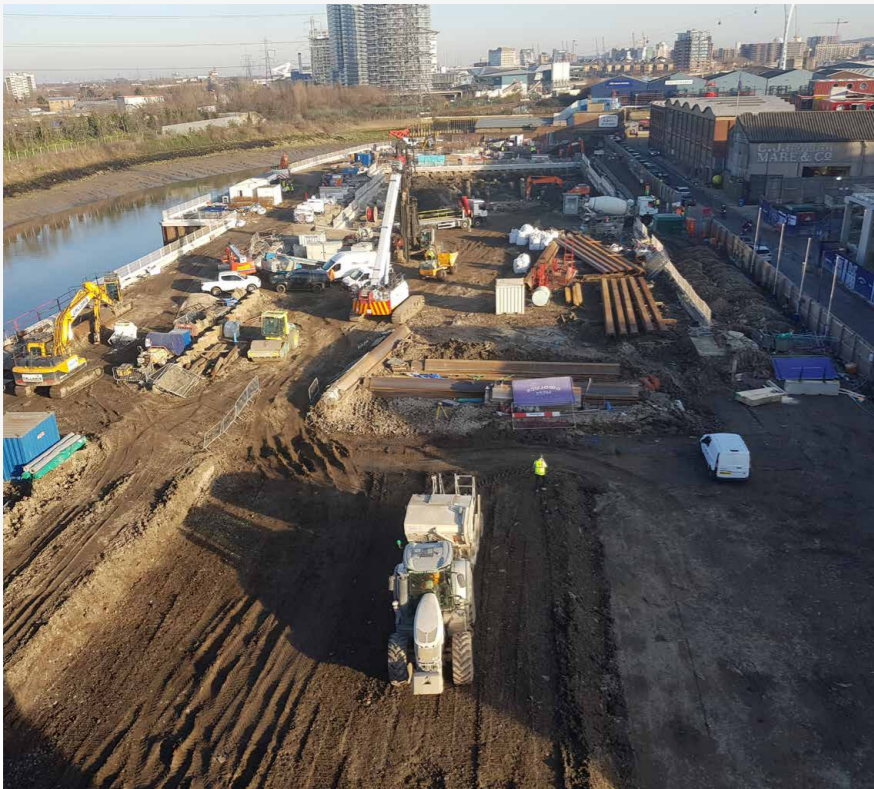


# REMEDIATION

## ASBESTOS IN SOILS

Asbestos in soils has been a contentious and problematic issue on development sites throughout the UK for many years. Without correct management of the demolition process or the placement of fill or made ground that contains asbestos fragments, cleaning up the problem can be costly, time consuming and fraught with risk. But this doesn't have to be the case!

At Cognition Land and Water, we have a longstanding track record of managing and remediating issues associated with asbestos in soils. Careful materials management, selective screening, hand picking, processing and treatment of soils can remove the bulk of the asbestos. Once this much smaller volume of highly concentrated asbestos has been removed from site and disposed at a suitably licensed facility, the residual soils can be reused within the works. If placed in a distinct and recorded location, beneath a clean cover system, there is no risk to future site users or the local environment and the development can progress without undue cost, programme of regulatory compliance issues.



## MATERIAL MANAGEMENT

For us at Cognition Land and Water, the key driver in establishing a pragmatic and cost-effective remediation strategy for a brownfield site is most often the minimisation of offsite disposal and optimisation of onsite reuse of site won soils. On our Royal Wharf development in East London, we achieved 99.5% soil reuse on the project with massive sustainability, environmental, cost and programme benefits. High quality material management and effective processing, treatment and remediation of impacted soils is fundamental in achieving this positive outcome.

A perfect example of this approach is when the developer of a proposed residential development at Worcester Park came to us with a problem! They had significant stockpiles of asbestos contaminated soil on site that was destined for landfill, archaeological remains that needed protection, a large excavation that needed filling and a requirement for import of 3,500m<sup>3</sup> of pile mat material.

Cognition completely rationalised the groundworks design to arrive at a far cheaper, quicker and more practical solution:

1. Hand picking visible asbestos fragments from the stockpiled materials;
2. Processing, screening and mechanical segregation of stockpiled and excavated soils;
3. Placement of an archaeological protection system using sustainably sourced sand imported under the CL:AIRE DoWCoP;
4. Engineered filling of the existing voids using site won soils; and
5. Cement stabilisation of site soils and placement as pile mat.

*Our approach on this and many other sites lead to significant cost and programme savings for our clients.*

## ENCAPSULATION & STABILISATION

Soil stabilisation involves the introduction of specially formulated cementitious or liquid solutions directly into or onto the ground through the use of purpose built injection augers or dosing at the surface followed by rotavation and compaction. The system is designed to achieve reduced permeability and/ or increased strength within the soil mass to improve the physical properties of soils. However, it also has the added benefit of 'locking in' leachable contaminants, thereby providing a very effective remediation solution.

This technique is a cost effective alternative to importing aggregates for both temporary and permanent works. Cognition Land and Water was one of the first ground engineering contractors to introduce to the UK the notion of cement stabilisation of site arisings to create pile mats in the early 2000s. We now use this approach on over 90% of our sites resulting in a far more sustainable, cost-effective and quicker working platform than the disposal of site arisings and the import of aggregates.

In-ground soil stabilisation can be used to form highly efficient cut off walls within or around contaminated sites without needing to dispose of large volumes of contaminated spoil. Cognition has used this technique on many sites to great effect.





# REMEDIATION

## FABEX-FREE PRODUCT REMOVAL

Cognition Land and Water offers an innovative solution for the remediation of free phase oil contamination of groundwater. Having already achieved great success in dealing with contaminated sites across much the USA, Cognition is unique in offering the system to the UK market.

Traditional remedial techniques, such as pump and treat, are often costly and inefficient in recovering free product. Based on extensive experience addressing petroleum and chemical spills, we can deploy the FabEx system to recover both light and dense non aqueous phase contaminants (LNAPL and DNAPL), also known as free-phase product.

The simple but highly effective NAPL Fabric Extraction Technique - FabEx - utilises an oleophilic/ hydrophobic fabric capable of adsorbing the product with a 99% recovery efficiency. The fabric is conveyed in a continuous loop into the well to intercept the oil-water interface. As the fabric travels through the interface, product is adsorbed. The adsorbed product is then removed in a specially designed desorption unit and the recovered oil collected in a storage drum or tank for disposal or recycling.

There are many advantages of the system over conventional groundwater treatment or product removal systems but the key benefits include:

- Small footprint is perfect for operational or space restricted sites
- Eliminates the need to extract/ treat/ process large volumes of groundwater
- Minimises or eliminates disposal costs
- No requirements for groundwater permits
- Recovery is not influenced by fluctuating water table
- Light/ dense Non Aqueous Phase Liquids (NAPL) recovery at highly impressive speeds
- System can be deployed in wells of varying diameters (as small as 50mm) and in boreholes at depths of up to 60m
- Recovery efficiency with 99% product-water ratio
- Reduces O&M costs by nearly 70% over conventional pump and treat systems
- Optional remote operation
- Low power usage and can be combined with solar and wind power units

## BIOREMEDIATION

From bench and field trials in the challenging conditions and climate of Kuwait, to scores of successful bioremediation projects in the UK, Cognition Land and Water has an enviable track record in the successful and cost-effective remediation of hydrocarbon impacted sites using bioremediation technologies. We have funded and undertaken academic research and trials to ensure that the additives we use and the temperature and moisture condition we maintain in our works result in the most aggressive conditions for the breakdown of hydrocarbons in the least time possible.

On our projects, we regularly treat excavated and processed hydrocarbon-impacted soils ex-situ using bio additives. The soils are treated using a number of additives including HCR, Bio SRO2, PGA, Bio nutrient, cultured indigenous bacteria and Skyhawk Hydroeater. Cultivated indigenous bacteria and ligninolytic fungi may also be used to supplement treatment processes and Oxygen Release Compounds (ORC) may be used for extended aerobic bioremediation of the hydrocarbons.

Where it is uneconomical or not possible to remove material for bioremediation, we have also carried out in-situ bioremediation. These methods are implemented through boreholes, forming trenches or in-situ bio piles and can prove very effective in the right circumstances.



## INVASIVE SPECIES

The main invasive species found on marginal land include Japanese Knotweed, Giant Hogweed, Himalayan Balsam and Rhododendron Ponticum. They are all highly regulated and allowing them to spread off your land can be a criminal offence. Although there is no obligation to remove from land you own, these species spread quickly, out-compete native plants, and can cause serious damage to structures, pavements and drainage infrastructure. Working with specialist sub-contractors, we have significant experience in the management, removal, burial on-site or disposal off-site of invasive species.



## VALIDATION & VERIFICATION

Scrupulous record-keeping and collating site verification/ validation/ completion report data from the start of the project (rather than upon completion as is oftentimes done by others) is a distinct approach taken by Cognition Land and Water. We have learnt through experience that the collating the required information at the completion of the project is stressful, fraught with difficulties, and less likely to achieve a high quality Verification Report required for discharge of planning conditions, surrender of an environmental permit, confirmation of the completion of the works, and settlement of final payments.

This is why we have put in place comprehensive systems and procedures to ensure we maintain accurate and up-to-date records of site works from project commencement and collate those records in one location in our project folders from the outset to make the compiling of the final verification/ validation/ completion report a straightforward and painless process.





# REMEDIATION

## SITE INVESTIGATION

Cognition Land and Water is not a site investigation contractor and we do not regularly carry out site investigations as a single service on a project. However, through the vast experience and track record of our professional team, including several who have worked within ground investigation contractors and consultants for many years, we are adept at planning, specifying and managing site investigations for projects where we have been commissioned to carry out our ground engineering and/ or remediation contracting services. This may include additional desk study research, supplementary ground investigation following gap analysis, ground investigation to finalise detailed design, additional investigation to refine our approach or solution to a project, installation of additional gas/ groundwater monitoring wells, or investigations into unforeseen ground conditions during a project.

Our in-house staff and plant resources makes the execution of ground investigations cost effective and rapid for our clients. Strong relationships with our network of specialist ground investigation contractors means that we can bring in these specialist services on larger investigations using a wide variety of techniques and technologies.



# CIVIL ENGINEERING



REMEDIATION



CIVIL ENGINEERING



PROJECT  
MANAGEMENT



DECOMMISSIONING



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# CIVIL ENGINEERING

Civil engineering is a fundamental element of many of the projects Cognition carry out. Whilst our focus started in the ground with geotechnical and ground engineering, we have expanded our service offering to include a wide range of infrastructure and buildings services to complement our traditional offering.

## EARTHWORKS

Cognition carries out a large number of earthworks projects, predominantly involving cut and fill to create required landforms and development platforms. We move approximately two million cubic metres of soil per year, the vast majority of it being reused within the source site as part of our aim to minimise soil transfer and disposal.

The careful management and control of such earthworks is critical to ensure that they are completed in accordance with the project design and specification. We have an in-house technical team of engineers and specialists who monitor, test and record the performance of the earthworks process throughout the project. This includes source compliance testing, performance testing during placement, monitoring during and post placement and long-term monitoring upon completion of the works. This all culminates in the production of a verification report confirming that the works have been completed to design and specification and that the long-term performance is as expected.

For many years, due to its adverse impact on resources, carbon, the environment and sustainability, material excavation and disposal (“Dig and Dump”) has been considered unacceptable practice. Limited landfill capacity, increasing landfill tax, new and emerging remediation technologies, public perception, and an unwillingness to simply move contamination from one place to another are further reasons why the construction industry is rapidly moving away from this out-dated approach to soil management.

At Cognition Land and Water, our aim is to recycle 95% of all excavated materials to minimise waste generation and disposal, adopt a more sustainable approach, and comply with our net zero carbon commitments. An example of this in practice is the work undertaken at Klondyke on the Isle of Sheppey, where we excavated, processed and treated contaminated soils, only removing untreatable deleterious waste to landfill. We also imported clean, naturally occurring soils from other local sites to raise the development platform out of the flood plain, thereby diverting these soils from landfill also. All of this work was done under a combined Deposit for Recover Environmental Permit and DoWCoP Materials Management Plan.



# CIVIL ENGINEERING

## ROLLING DYNAMIC COMPACTION

Cognition uses state of the art dynamic compaction rollers, which are capable of compacting soils to depths of 4m to 5m below ground level. This technique offers an effective and rapid solution for development sites with poor quality or soft ground conditions. We have also demonstrated its effectiveness in compacting former landfill sites to improve ground conditions to a degree where land development can be successfully achieved.

As well as being able to focus compactive effort at different depths, the roller can also identify soft spots and record soil density across the soil profile. Compactive effort is recorded and presented in a real-time display to the roller operator, allowing the compaction to be directed and completed accurately and effectively, whilst ensuring all areas requiring compaction have been completed to the design and specification.

## ROADS

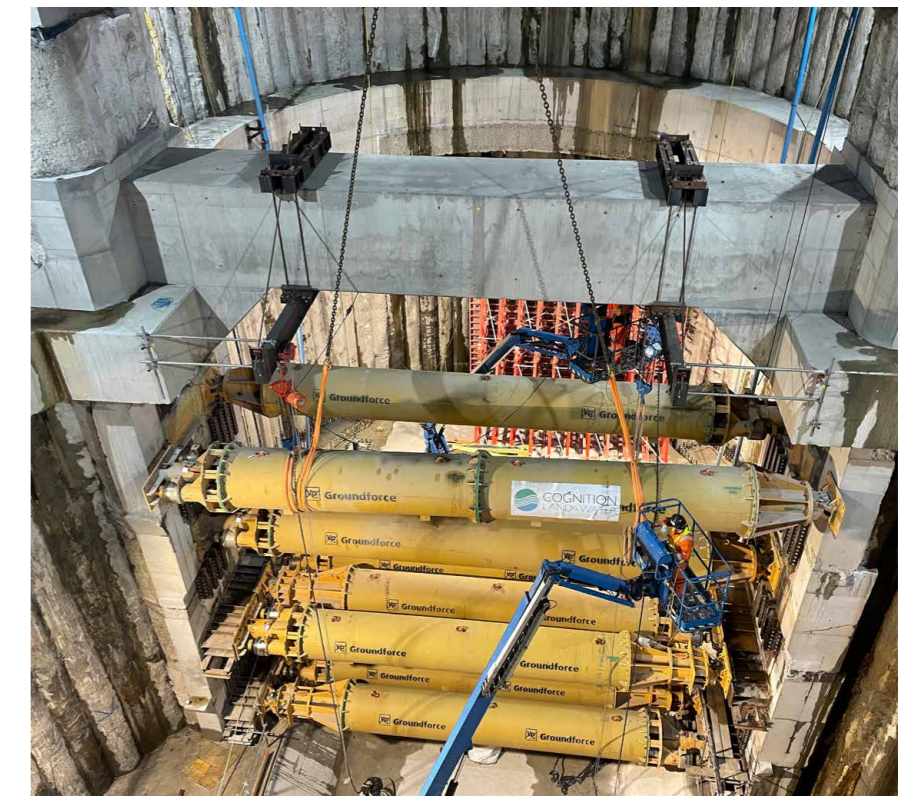
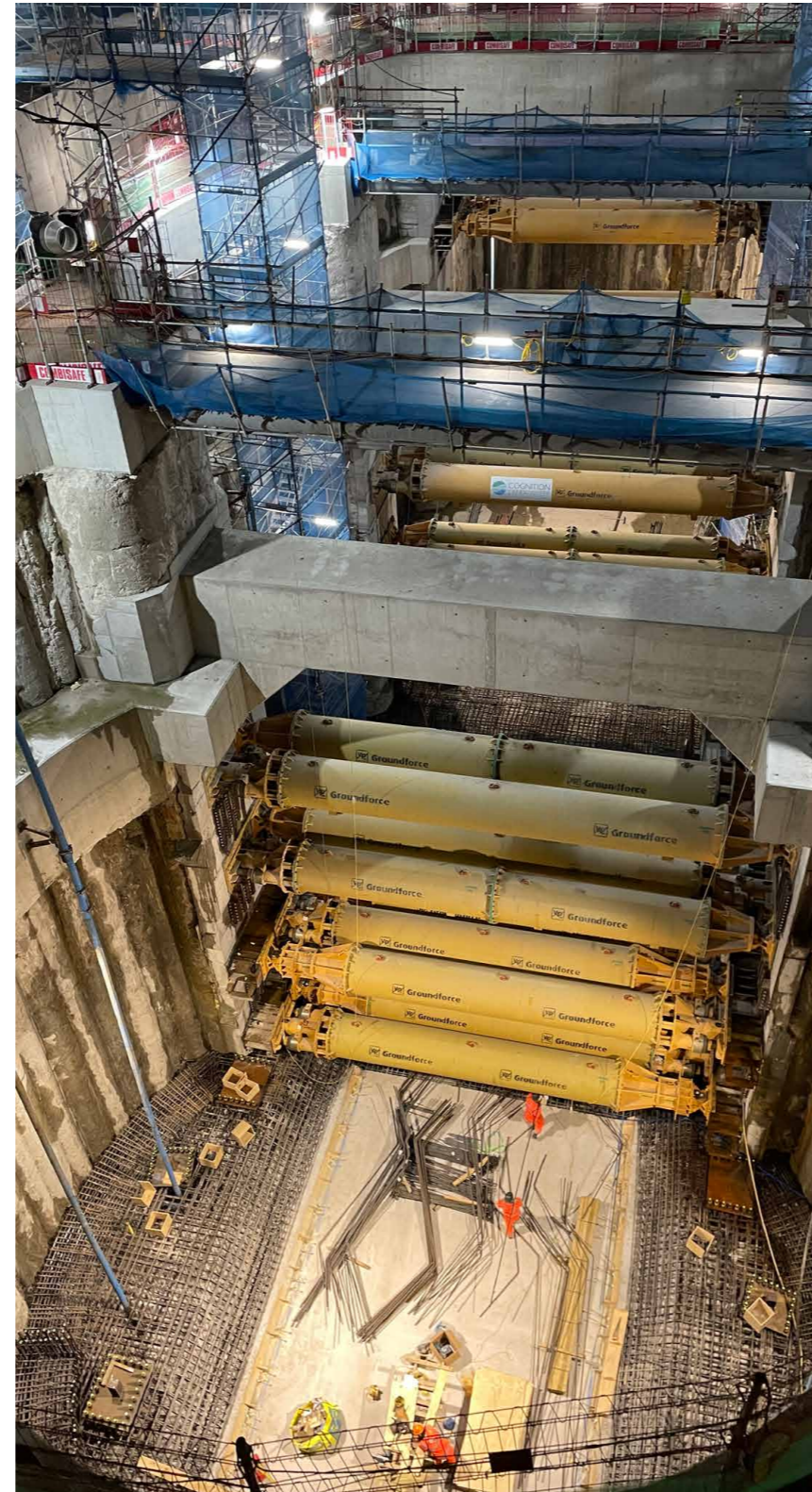
Cognition has completed a significant number of road construction projects, often as part of larger remediation or ground engineering works but occasionally as standalone contracts. We have recently completed a road scheme for Balfour Beatty in Guildford including deep drainage, kerbing, ground improvements to a former landfill, road pavement, white lining and street lighting/ furniture.

Another interesting roadworks project completed recently was the relocation of the coach park for The O2 (Millennium Dome) in Greenwich. This included all of the aspects of the Guildford project with additional diversion of services and construction of concrete retaining walls.

Where possible we look to redesign such schemes to make them more sustainable.

## SLOPE STABILITY

Cognition can carry out stability assessments as well as design and install geotechnical solutions to improve slope stability including stabilisation and reinforcement, vegetative walls and gabion baskets.



## STABILISATION & PILING MATS

Cognition carries out soil stabilisation to improve the geotechnical strength of soil materials. The process often involves carrying out trials to select an appropriate binder such as cement or lime and optimising the binder concentration to achieve the required strength. Cognition pioneered the application of stabilisation for installation of piling mats in the UK, something that is now commonplace in the industry. We also use this process to improve subgrade or replace subbase for roads and hard standings.

Soil stabilisation enables the reuse of significant volumes of site soil materials that might otherwise be disposed offsite to landfill. The stabilised materials have increased strength compared to traditional granular fills and stabilised subbase can negate the need for subbase drainage.

An additional advantage of stabilisation is that it can encapsulate soil bound contaminants making them less able to leach into groundwater.

# CIVIL ENGINEERING

## WICK DRAINS, SURCHARGE & ACCELERATED GROUND SETTLEMENT

Cognition has designed and delivered a number of site improvement schemes by preloading and surcharging soil prior to development. In combination with Prefabricated Vertical Drains (PVDs), this solution is beneficial where ground conditions include poorly compacted made ground, soft alluvial soils, or ground at risk of differential settlement due to heterogeneous made ground. These schemes often benefit from the installation of vertical band drains and drainage blankets to relieve ground pressure across a site, which occurs during surcharging to aid and speed up soil consolidation.

## DRAINAGE

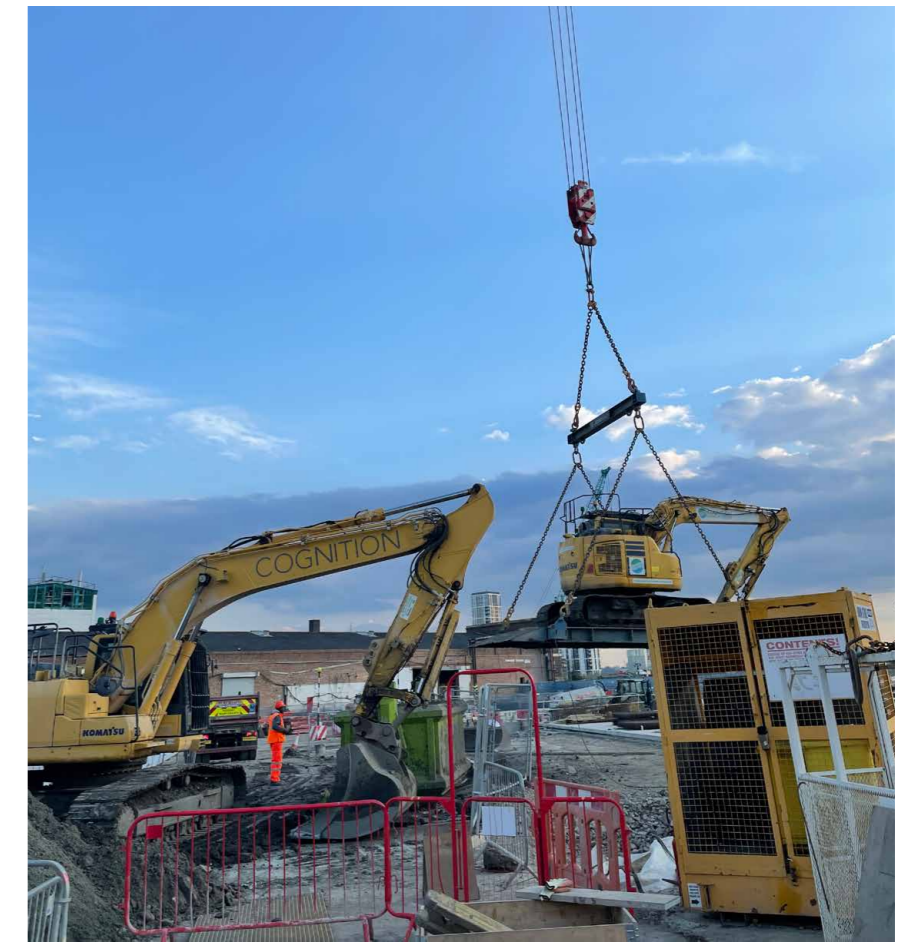
Cognition employs its own drainage gangs and carries out a large number of drainage schemes whether they be concrete, clay or plastic pipes, shallow and deep drainage. A recent scheme included pipe jacking under a dual carriageway in Wandsworth, in three 600mm diameter pipes, below the water table, and at a depth of more than 6m below ground level.

## CONCRETE STRUCTURES

Cognition carries out a wide variety of concrete works from capping beams, foundations, lift shafts, concrete frame buildings and tunnel shafts. We have recently completed the 21-metre-deep tunnel boring machine (TBM) launch chamber for the Silvertown Tunnel, the largest board tunnel in Europe. The project, which was on an accelerated programme, required 24-hour working across three shifts.

We have also recently completed a tunnel shaft in Wandsworth, and an eight storey concrete frame building in Newbury, which was completed five months ahead of programme.

Though some of our works are traditional civil engineering concrete structures, we enjoy working on more complex and difficult structures that most contractors would shy away from. We have a highly motivated, experienced workforce combined with strong technical, commercial and managerial support from the senior management team.



# SILVERTOWN TUNNEL

**SERVICES:**  
**HIGHWAY WORKS - COACH PARK**

**CLIENT:**  
**RIVERLINX**

## PROJECT OVERVIEW

The Silvertown Tunnel scheme (STT), when completed, will link North East and South West London from the North Greenwich area to the Royal Victoria Dock area (Silvertown) and will serve to reduce the current congestion at the Blackwall Tunnel.

The project involves the construction of a 1.6km long, twin-bore road tunnel, accommodating large vehicles including double-decker buses. It will include a dedicated bus, coach and goods vehicle lane, enabling TfL to provide additional cross-river bus routes. As a result, each bore is 12m in diameter and the largest bore tunnel conducted using TBMs in the UK to date.

The £1 Billion tunnel construction project was awarded to our client Riverlinx. A Joint Venture (JV) body created by BAM Nuttall, Ferrovial Agroman and SK E&C.

Cognition has successfully supported the JV in delivering key elements of the project to date culminating in our last project to construct the launch chamber for the Tunnel Boring Machine on the behalf of the JV.

The total value of works conducted by Cognition at the STT is £20 Million. Part of the project was the civil engineering element of the highways works and Greenwich Coach Park:

- Awarded contract as a civils company with remediation expertise
- 14,000m<sup>2</sup> car park constructed on stabilised sub-base with HBM build-up (Cognition value engineering)
- Turnkey project including treatment of contaminated soils, installation of services including drainage, M&E, technology (fibre optics, barriers, cameras).

## HIGHWAY WORKS

In addition to the coach park construction, Cognition also completed other diversionary road works and created new access roads to accommodate the new proposed site set up and facilitate access for both local stakeholders and STT tunnel works.

M&E and Service Infrastructure Installation – Cognition supported the project by carrying out many investigatory and diversion service works. Including installing the power ducting required for the future tunnel and TBM at the Silvertown side of site. Street Lighting and car parking infrastructure (barriers and ticket machines etc).

Complex & Major Civils – We undertook the creation of the Launch chamber for the TBM. The shaft was nicknamed “the peanut” due to its unique shape. These works entailed seriously impressive reinforced concrete works, mass digging of the shaft 22m deep, complex Installation of props, Remedial works to piled structures installed by others not meeting the design and QA specification, complex lifting, complex temporary works and logistics. Due to the programme constraints and issues encountered by the third-party pile works, we accelerated the works at the request of the JV. This acceleration resulted in the works being conducted 24/7. We would accumulate in excess of 25,000 working hours a month during the project and we delivered the project with no major incidents or accident.



# NEWBURY GASWORKS

## SERVICES:

**DESIGN & BUILD OF S278 / S38 WORKS, CFA PILING, GROUNDWORKS & CONCRETE FRAME**

## CLIENT:

**NELSON LAND LTD & PSP CONSULTING**

## THE CHALLENGE

Newbury Gasworks site, within the Sterling Industrial Estate, had a long history of industrial use leaving a heavily contaminated site within a built-up area of Newbury surrounded by residential and commercial properties. Cognition Land and Water successfully completed the remediation phase of the development and were then selected by the Client for the follow-on groundworks, concrete frame and highway works comprising S278 and S38 works.

The concrete frame comprised of six reinforced concrete frames on top of an undercroft carpark. The frames varied in height from between 3 to 8 stories. There will be 119 private residential apartments and concierge once the development is completed.



## THE APPROACH

Our primary approach to all groundworks and concrete frames is to identify and seek out opportunities that bring both a financial and programme benefit to our clients during the tender submission and pre-contract stage. Having completed the ground remediation, Cognition were able to take advantage of their prior knowledge of the site. As part of this review, Cognition identified an opportunity to raise the basement slab finished floor level removing the need to remove in excess of 3500m<sup>3</sup> of hazardous and non-hazardous material. Cognition also identified when reviewing the initial design information received at tender stage, the approach adopted by the design team and previous preferred contractor would have



compromised the remediation works and resulted in unforeseen further expense to the Client if they had been completed. To mitigate against the increased height with raising the building, Cognition identified the heights within the basement and upper floors were excessive for a residential development. As such, these heights were reduced to ensure the overall building height and massing were maintained, without compromising the apartments design for the Clients purchasers.

As the development is of a piled foundation solution and the depth to groundwater was a couple of meters below the proposed basement level, Cognition identified the basement car park could be revised from an in-situ concrete slab to a tarmac road formation for the most part. This provided both a cost and time saving to our client.

In reviewing the final ventilation strategy of the car park, Cognition identified an opportunity with the increased levels to introduce perimeter openings for natural ventilation. Both of these design changes meant that the gas membrane which previously covered the full expanse of the car park could be reduced to core areas only and with the basement now being naturally ventilated, provided further cost savings to the Client with the following M & E contractors.

## THE OUTCOME

While the contract is still in its construction stages, Cognition have so far presented the Client with a project that has significant cost savings and benefits for the concrete frame package, dry lining package with standard board ceiling heights and reduced M & E liability by providing a partially naturally ventilated car park.



# PROJECT MANAGEMENT



REMEDIATION



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# PROJECT MANAGEMENT

## PLANNING

With a team of experienced and highly qualified professionals in our project planning and management team, Cognition is adept at taking your project through all stages from concept, feasibility, and due diligence through to value engineering, design and regulatory approval and on to implementation, project management and completion. Our ISO9001 accredited Integrated Management System provides us with the tools to deliver your project effectively and efficiently, on time and within budget, to the quality you expect from Cognition Land and Water.

## PERMITTING & REGULATION

Cognition has an enviable track record of successfully negotiating approval of permit and licence applications with the Environment Agency, local authorities, and other regulators. Whilst the majority of our team are contractors 'born and bred', a significant proportion of our senior management have specialist skills and backgrounds that lend themselves to successful regulator negotiation. For example, our Operations Director has some 20 years' experience working within the Environment Agency and has an in-depth knowledge of the organisation and how it operates. In addition, our Technical Director has almost 30 years' experience working for engineering and environmental consultancies and understands their key drivers and demands.

## BUILDING INFORMATION MODELLING (BIM)

Cognition's engineering team maintains a high standard of Computer Aided Design (CAD) capability and is skilled in the use of several software packages developed for earthworks and remediation works. Autodesk products, GIS packages, and specialist survey and earthworks packages such as McCarthy Taylor LSS are used for data analysis and 3D modelling, as well as conventional drafting and as-built survey production. We work exclusively with 3D data and all digital CAD deliverables can be delivered in any required common data format. All chemical and geotechnical soil testing will be provided also be provided in AGS format to allow creation or contribution to a BIM model, and Cognition can utilise AGS data in 3D modelling.

## MATERIALS MANAGEMENT

The sustainable management of soils is a key driver for Cognition Land and Water. Undoubtedly, the greatest impact we can make in terms of cost, programme, sustainability, waste minimisation and carbon reduction is the proactive, systematic and meticulous management of site won soils.

Specialist processing, picking, and screening; biological and chemical treatment; stabilisation and solidification; rigorous tracking and segregation of stockpiles - all of these approaches lead to very significant reduction in unnecessary disposal to landfill with resultant savings in costs, tax and the loss of valuable materials resources. We regularly achieve reuse or recycling of over 95% of previously marginal and contaminated soils on our projects.

This is such an important issue for us that Cognition is a lead funder and Project Steering Group member for an upcoming CIRIA guide into the Sustainable Use of Surplus Soils and Aggregates on Construction Sites. Being at the forefront of industry best practice gives us a valuable edge over our competition and enables us to offer cutting edge approaches and methodologies to our clients.

## HOUSING PROJECT MANAGEMENT

Cognition offers a turn key project management service from start to finish where we take on a project for a developer and carry out approvals, enabling works, groundworks followed by organising all the follow-on trades. We manage these trades to completion of the whole build and handing over the completed properties to ensure we meet the developers' budget and programme deadlines.



# DECOMMISSIONING



REMEDIATION



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# DECOMMISSIONING

Cognition carries out a wide range of decommissioning in line with its demolition services. We define our decommissioning services as the careful removal of items and the safe dismantling of a structure. This includes removing gas holder frames and setting aside for re-use.

Moreover, Cognition has undertaken a large amount of demolition including old sewage treatment plants, warehouses, concrete and steel frame buildings, bridges, petrol stations and gasworks. Some of the more complex jobs are next to railway lines, rivers and can be severely contaminated with asbestos, radioactive materials and hydrocarbons.

Cognition also carries out large amounts of storage tank removal which often involves degassing, dewatering and sludge removal as part of the works. This can be above-ground tanks, underground tanks, fuel tanks, chemical tanks and gas holders. We have recently completed the dewatering and desludging of the former gasholders at the Oval Gasworks in London.



# ENVIRONMENTAL



REMEDIATION



CIVIL ENGINEERING



PROJECT  
MANAGEMENT



DECOMMISSIONING



ENVIRONMENTAL



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# ENVIRONMENTAL

## SITE INVESTIGATION

Cognition Land and Water is not a site investigation contractor and we do not regularly carry out site investigations as a single service on a project. However, through the vast experience and track record of our professional team, including several who have worked within ground investigation contractors and consultants for many years, we are adept at planning, specifying and managing site investigations for projects where we have been commissioned to carry out our ground engineering and/or remediation contracting services. This may include additional desk study research, supplementary ground investigation following gap analysis, ground investigation to finalise detailed design, additional investigation to refine our approach or solution to a project, installation of additional gas/ groundwater monitoring wells, or investigations into unforeseen ground conditions during a project.

Our in-house staff and plant resources makes the execution of ground investigations cost effective and rapid for our clients. Strong relationships with our network of specialist ground investigation contractors means that we can bring in these specialist services on larger investigations using a wide variety of techniques and technologies.



## REGULATION PLANNING

Cognition regularly and successfully collaborates and negotiates with local communities, local authorities, the Environmental Agency and other regulators. We constantly monitor changes and updates to environmental regulation and legislation and adjust our internal procedures and practices accordingly. Several of our employees have worked in the past with regulators including the Environment Agency. Hence, we have in-depth knowledge and experience of the objectives, drivers and touch points of regulator stakeholders.

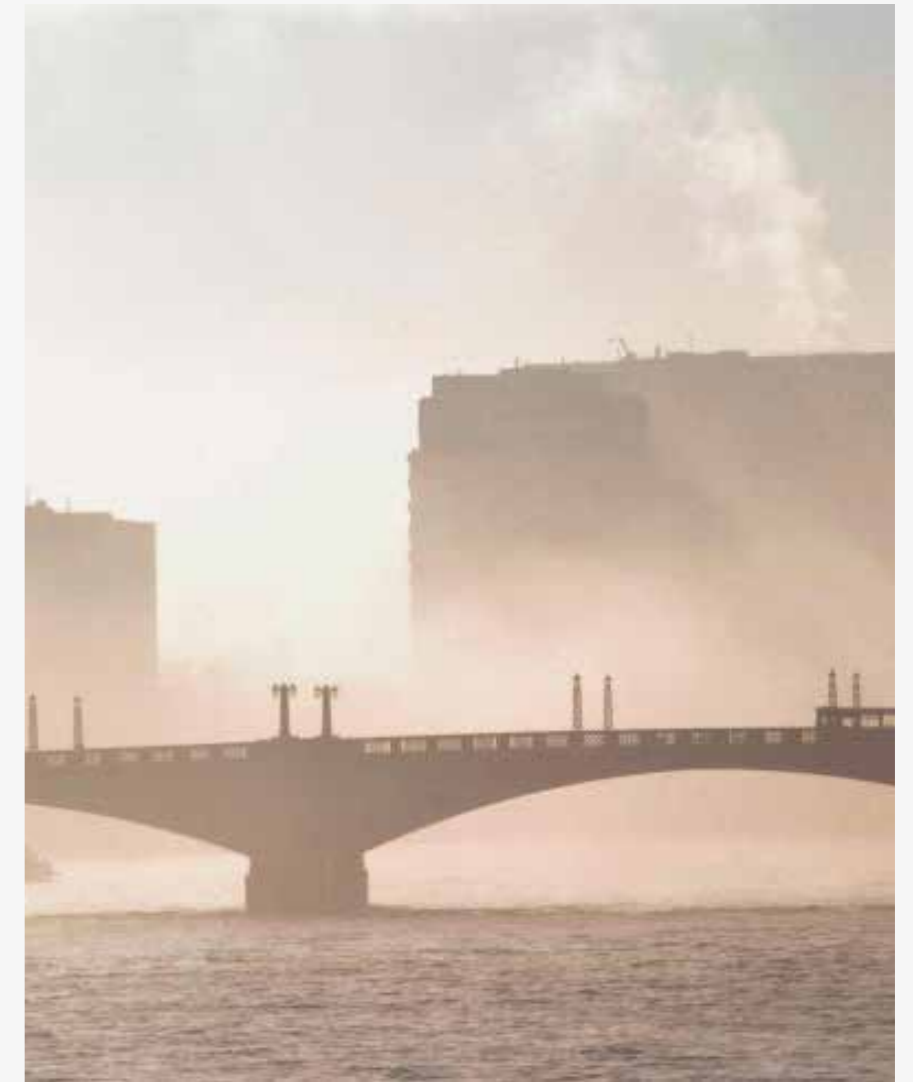
## ASBESTOS REASSURANCE MONITORING

Asbestos air fibre reassurance monitoring is undertaken by an independent UKATA accredited specialist contractor during all asbestos remedial activities undertaken by Cognition. Monitoring includes site boundary, close proximity around the processing area as well as personal monitoring of the most susceptible site staff.



## AIR MONITORING

Cognition uses various manual and automated monitoring systems to control emissions of volatile compounds, dust and odours from all our site activities and deploy suitable measures and controls to mitigate these before they become a nuisance or a potential risk. For daily monitoring, Cognition uses a mix of active, dust monitoring units (Turnkey OSIRIS), active VOC monitoring sensors (Turnkey iGas) as well as passive, dust deposition pots, manual PID and odour observations. The AirQWeb system allows us to view, download and generate data reports as well as share live data with our clients. We exclusively use UKAS accredited laboratories for all sample testing.





# ENVIRONMENTAL

## WATER MONITORING

Cognition conducts various groundwater and surface water monitoring as part of our obligations under mobile plant permit as well as requirements of site-specific environmental permits and site operations. This is managed and carried out by our team of trained and competent site engineers who also have the experience and skills to conduct site investigations, monitoring well installations and decommissioning.

## NOISE & VIBRATION

Cognition is committed to reduce noise and vibration levels from all site activities by using modern and well maintained plant and equipment avoiding excessive noise and minimising vibration. All our equipment and activities are fully compliant with the recommendations set out in BS 5228-1&2:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites. We monitor our activities daily using a mix of manual and automated active monitoring equipment.

## RISK ASSESSMENT

We carefully plan and actively assess potential hazards and resultant risks of all our operations. This informs our decisions regarding all aspects of our works such as our approach to the required works, access, transportation, selection of equipment, site logistics and mitigation measures to minimise the risk to site staff and surrounding receptors such as local community or the wider environment.

## MANAGEMENT PLANS

With substantial recent investment in sustainable technologies, materials, plant and equipment, Cognition is now in the process of implementing ISO 14001 and ISO 45001. Both of these accreditations will strengthen our systems and performance and reinforce our existing status as a Net Zero Carbon company.



# NUCLEAR



REMEDIATION



CIVIL ENGINEERING



PROJECT  
MANAGEMENT



DECOMMISSIONING



ENVIRONMENTAL



NUCLEAR



NUCLEAR

# NUCLEAR

Cognition began working within the nuclear sector over a decade ago by providing the industry with innovative technologies to treat radiologically contaminated materials from our extensive experience within the remediation sector. Since then, we have worked on a wide range of projects within the industry from Nuclear decommissioning on licensed ONR sites to the clean-up of Naturally Occurring Radioactive Materials (NORM) on old industrial sites to enable future development. From the implementation of radiological control to the delivery of site work we can safely manage and deliver remediation works across all of the industry.





# A NET ZERO CARBON COMPANY

In 2020, Cognition teamed up with Climate Care to offset our total annual emissions and becoming Carbon Neutral for the first time. In the same year, the company committed to stay proactive, adopting and developing more sustainable remediation methodologies, selection of materials and energy sources we use, reducing the need for offset element of our emissions. Our long-term goal is to continue improving efficiency and minimise emissions from our routine site and office operations across the board.



# ENVIRONMENTAL MANAGEMENT

At cognition we strive for continual improvement in everything we do through innovation, application of industry best practice and communication of key drivers and performance indicators across our entire organisation. This approach is enshrined in our environmental management arrangements on all projects.

We apply our Environmental Management System (soon to be ISO 14001 accredited) on all projects and align our works with the procedures, systems and policies set out in our EMS. Industry best practice, learning points and environmental updates are regularly communicated to our team through our monthly technical newsletter, Cognition on a Mission, and monthly lunchtime webinars and training sessions. These are a great way to keep our team updated with the latest innovations and happenings in relation to environmental best practice in the industry.

Our technical team are at the forefront of the industry being leaders and members of numerous focus groups, lobbying groups, best practice groups, research organisations, etc. including the AGS, RemSoc, IES, CIRIA and CLAIRE.

We feel that the minimisation of waste and the sustainable reuse of surplus soils on site is usually where we can add the greatest value to our projects and the environment in general. This is why we are funding and on the Project Steering Group for CIRIA's research project into the Sustainable Management of Surplus Soils.

## Key areas of focus for our environmental management on projects include:

- Environmental monitoring (baseline, construction phase, post completion)
- Operational, personal exposure and works boundary monitoring
- Monitoring of numerous potential impacts including dust, noise, odour, vapours, vibration, asbestos, water, energy use, water use
- Soils, waste, stockpile control and management
- Pedestrian, vehicle and traffic management
- Materials, fuel, COSHH storage, spill prevention and control
- Ecology, UXO and archaeology control and engagement
- Neighbour, local community engagement and liaison

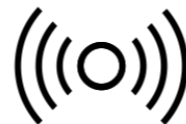
We maintain up-to-date environmental and zero carbon policies, which are available to view on request.



Environmental Monitoring (Baseline, Construction Phase, Post Completion)



Operational, Personal Exposure & Works Boundary Monitoring



Monitoring. Numerous Potential Impacts including Dust, Noise, Odour, Vapours, Vibration, Asbestos, Water, Energy use, Water use



Soils, Waste, Stockpile Control & Management



Materials, Fuel, COSHH Storage, Spill Prevention & Control



Pedestrian, Vehicle & Traffic Management



Ecology, UXO & Archaeology Control & Engagement



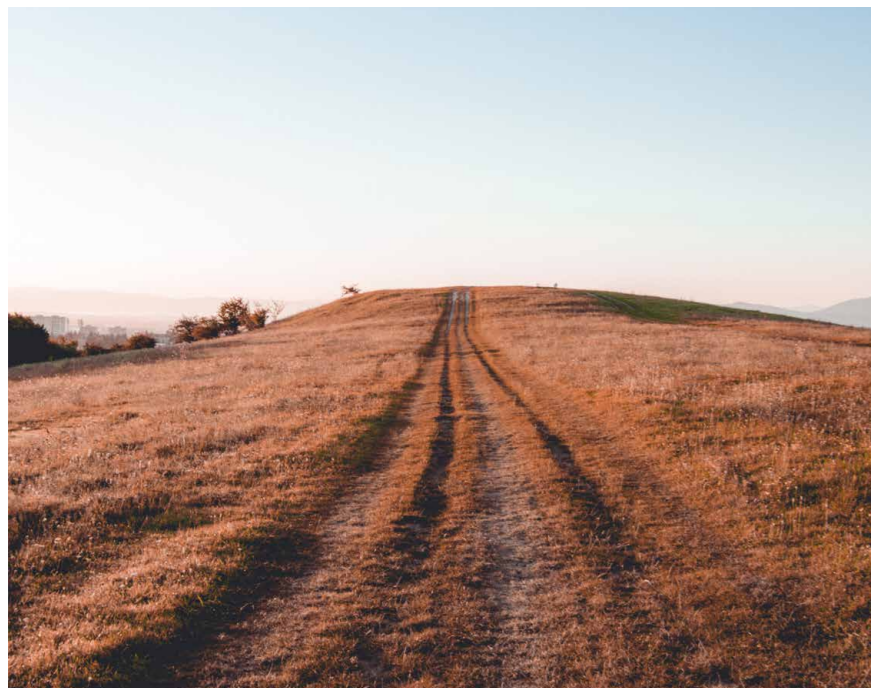
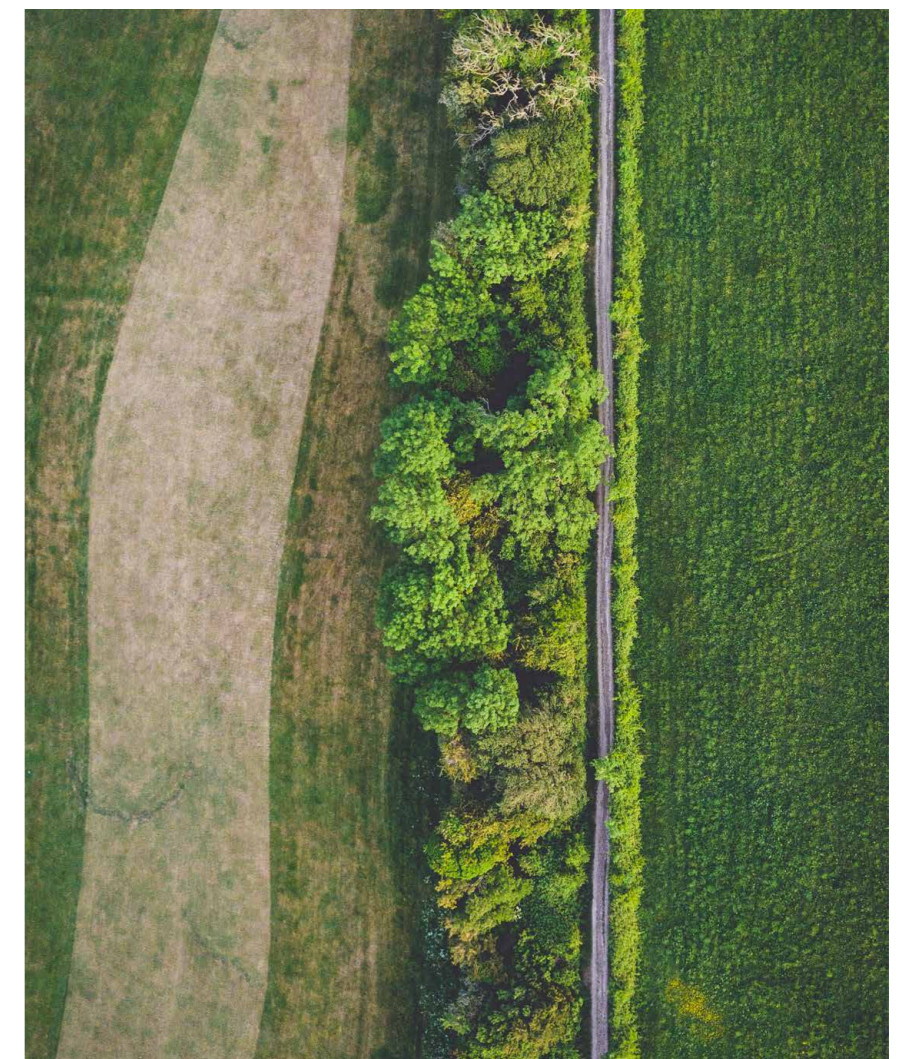
Neighbour, Local Community Engagement & Liaison

*We maintain up-to-date environmental and zero carbon policies, which are available to view on request.*

# SUSTAINABILITY

As a land remediation company, a key driver for Cognition’s operations is our focus on processing, treatment and reuse of excavated soils and construction arisings already present on site. Cognition typically reuses 98% of the material we excavate (via processing and treatment) reducing the need for material to be disposed or/and imported, saving on transport and landfill pressure. On our Royal Wharf project (six year project with a contract value of >£25M) we achieved the reuse of 99.5% of all arisings during the works. The use of advanced soil processing, treatment, bioremediation, soil washing, soil stabilisation, aggregate production through Quality Protocol, unique FabEx product removal system, and a variety of other remediation techniques allowed us to maximise reuse and recycling far beyond industry best practice.

We adhere to the principles of sustainable remediation in all our projects in accordance with the waste hierarchy and the Directive 2008/98/EC on waste (Waste Framework Directive). In order to achieve these sustainability objectives, and internal Health and Safety goals, we follow industry best practice and guidance. This includes ISO 1854:2017 Sustainable Remediation; Construction Industry Research and Information Association (CIRIA) C552 Contaminated Land Risk Assessment: A Guide to good practice; and the UK Sustainable Remediation Forum framework (SuRF-UK).



The material that we do use (e.g., cement, occasional timber, etc.), we source from recycled or/and sustainable local (UK) sources (PLC and PFA cement, FSC/PEFC timber, etc.). We also consider end of use so material needs to be preferably reusable or/and recyclable. All material and waste generated are recorded using the SmartWaste software and are included in periodic carbon footprint calculations, which enable us to monitor and identify opportunities for improvements.

Cognition make use of DoWCoP and apply Materials Management Plans to most of our projects to maximise re-use of soil materials. Where we can’t reuse soils on site, we will look to set up hubs under a cluster project, so that we can transfer surplus material to other sites. With waste materials, such as existing soil stockpiles, or where a registered landfill is present on site, we will operate under a Waste Recovery Permit, although there is less flexibility with this approach. We have in-house expertise who are able to negotiate a suitable outcome with the regulator.

Cognition encourages the use of reusable packaging and has already reduced the use of packaging through the application of our Environmental Policy and our Zero Net Carbon Policy. We encourage “take back” schemes for bulk bags and other packaging wherever the option is available to us.

# QUALITY ASSURANCE

Cognition's Quality Management System (QMS) is formed from a collection of standards, processes and procedures centred around the implementation of a Quality Management Plan (QMP), produced in accordance with ISO 9001:2015 and ISO 10005:2005.

The Cognition QMS is based on the principle of continuous improvement and we set standards and objectives based on project performance. We achieved ISO 9001:2015 certification in 2017 and have developed robust quality assurance procedures that meet the standards of tier I civil engineering contractors. We have been audited and tested both in our office procedures and on various, large scale projects.

Cognition's policy ensures the continual improvement of quality, and performance is assessed through monitoring, measurement and assessment of project works. Objectives are set in accordance with the review of this monitoring and Key Performance Indicators (KPIs) measured. As a result of this process, improvements can be implemented to advance the delivery of projects.

The quality management process revolves around four stages of quality planning (PLAN), quality assurance (DO), quality control (CHECK) and quality improvement (ACT).



# SOCIAL VALUES

Alongside Cognition's commitment to delivering our work in the most sustainable, cost effective and efficient way possible, we also have a keen focus on driving social, economic, and environmental improvements in the communities in which we work. Our Social Value commitments are managed, delivered and monitored through our suite of externally audited policies and procedures. These ensure we deliver on our promises and objectives, not only through our direct employees and activities, but also throughout our whole supply chain.

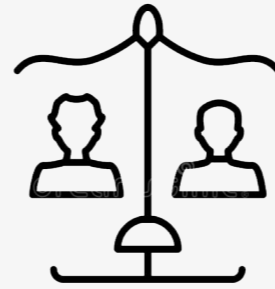
Many projects will have discrete and specific social value targets and objectives. We are fully committed to achieving all of these targets through the application of existing programmes and policies along with adopting new initiatives where required. We see this as being wholly in line with our commitment to continual improvement in everything we do. On larger projects, we will employ a dedicated member of staff to drive the delivery of our commitments and report on progress.

We have an enviable track record of delivering on social value targets and KPIs on many other projects in London and beyond, resulting in significant benefits to local communities, of which our employees are very often a part. Some of the key areas we focus on include:

- Local employment
- Equality
- Education
- Environment
- Local community



## LOCAL EMPLOYMENT



## EQUALITY



## EDUCATION



## LOCAL COMMUNITY



## ENVIRONMENT

# WHAT OUR CLIENTS SAY

*"When Cognition arrived on the project in the 4th quarter of 2020 we were in the grip of the COVID 19 pandemic. Working practices proved challenging to ensure the wellbeing and health of everyone on the project as well as applying stress to the management teams. After all, we were trying to work under circumstances never experienced before in living memory.*

*Cognition and their site team were one constant. We were able to rely on a consistent team that were professional throughout with the right skill sets. This also applies to the site personnel. Relationships were developed with all personnel which aided in problem solving and innovation. Turn over of Cognition personnel was lower than one would normally expect, especially considering the climate at the time.*

*I would happily work with Cognition again".*

**RIVERLINX**

*Cognition were an excellent contractor who were in the detail of the remediation works and gave great support working alongside the EA in gaining the necessary approvals. Cognition were very safety conscious and very innovative with the materials reuse on site that ensured no material left the site, highlighting their sustainability awareness. The works were carried out over seven months and were completed ahead of program. The onsite management by Gerry and Jack along with the senior support meant the smooth running of the works. Cognition delivered an excellent programme of works, which unlocked the wider scheme enabling substructure works on Phase 1 to commence on time. I look forward to working with Cognition again in the near future.*

**ST. JAMES & ST. WILLIAM  
(BERKELEY HOMES)**

*"One of the best installations of large scale hydraulic propping that I have been privileged to be involved with. Cognition were working in an extremely challenging environment, but were able to overcome all issues effectively".*

**VPPLC**

*"The Bow Common site is one of the best I have visited, being managed very well".  
"We were really pleased to hear about all of the proactive engagement that has been carried out with local residents". "If all future sites at this stage are presented and managed the same we will be very pleased."*

**ENVIRONMENT AGENCY  
BOW COMMON SITE AUDIT**

*"Acumen Portfolio Solutions have been working on the Royal Wharf Project in the capacity of Client appointed Project Managers and Quantity Surveyors for over seven years.*

*Cognition were the first contractor on site carrying out demolition, site clearance and remediation works with Rob Fox acting at the time as Site Manager and Albert Brahilika as his site supervisor and six years later they both still remain on site carrying out technical and difficult works for the client.*

*Not in any way understating how exceptionally beneficial their specialist experience and the successful completion of their original package of works was to the overall viability and commercial success of the project. It was their professional and "can do" attitude of taking on all manner of tasks that they were asked to carry out, many were a result of a failure on the part of an unrelated third party and typically all were of the upmost urgency...I would have no reservations about highly recommending Cognition and their team."*

**ACUMEN PORTFOLIO SOLUTIONS LTD.**

*"Cognition was at the forefront of praise and good practices, ranging from high quality access arrangements, overall shaft tidiness, fantastic area segregation, etc.*

*I cannot thank you enough as a team for making this safe and well managed given the tight schedules we operate to. Well done to all involved and well deserved.*

*Please keep up the good work!"*

**RIVERLINX**

*"The Site looked in a really good condition, Vivien Dent and Jamie Thompson (EA Controlled Waters and Planning, respectively) were both very positive in respect to the works that have been delivered to-date and the level of communication we have maintained throughout the project works. I would like to extend my thanks to all those involved in delivering these works during some testing months over the winter period. The hard work will hopefully all pay-off in swift closure regarding the validation and verification process."*

**ENVIRONMENT AGENCY SITE AUDIT  
ST. WILLIAM**

*"Our preference is to use Cognition as we've been very impressed so far with how you have worked at the former Homebase in Goodmayes".*

**FAIRVIEW NEW HOMES**

*"Due to the efforts of the team and in particular your Cognition Team here on site we scored 100% with a Gold Rating...your people are going over and above and I cannot fault anything you are doing on site".*

**VISTRY GROUP**

*"The company and staff were extremely professional and knowledgeable...We would certainly consider Cognition for future remediation and groundwork projects. We were very pleased with the overall outcome of what on the face of it was a difficult project with lots of potential pitfalls."*

**HANBURY PROPERTIES**

*"Cognition Land and Water Limited are a great bunch to work with - no nonsense construction firm, there to get the job done. Best contract I've done for years".*

**THAMESYARRA CONSULTING**

*Cognition are a reliable contractor with a pragmatic, collaborative 'can do' attitude to project delivery. They have demonstrated a clear understanding of the challenges experienced & have worked to overcome these in the most efficient way. The projects they have delivered are complex & large scale, & have been delivered on time and budget despite all risks and variables. Their input on this project has been invaluable in achieving the clients objectives.*

**LAMBERT SMITH HAMPTON**

*"Cognition shown great commitment, a proactive approach with a clear cooperation and attitude."*

**RIVERLINX**



# COGNITION

**COGNITION LAND & WATER**

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