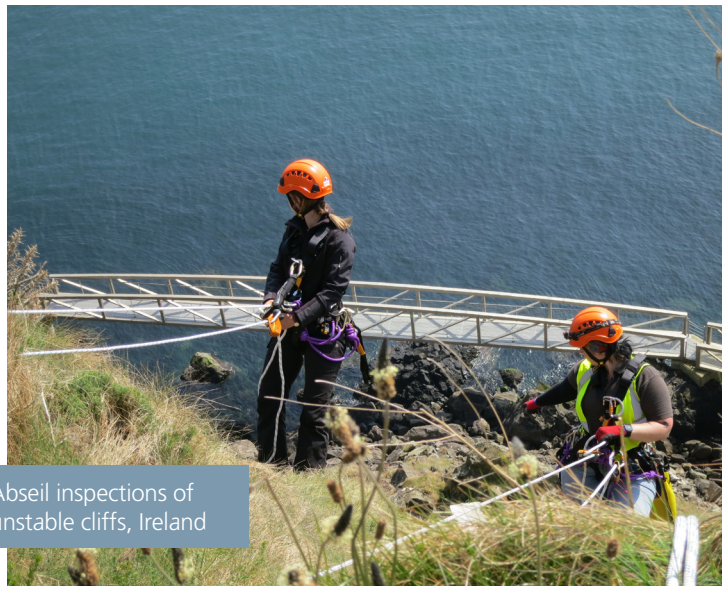
Red Rock Geoscience



Abseil inspections of unstable cliffs, Ireland

Dr. Peter Arnold (right) and Mr. Alan White (left), Founders & Managing Directors

Land development is now often on marginal and technically challenging sites and with this comes a requirement for specialist technical services to provide viable and economic ground engineering solutions. Established during the construction slowdown in 2011, Red Rock Geo is now a highly regarded provider of consultancy services across the natural environment and land development sectors.

Red Rock Geo provide geotechnical and geo-environmental consultancy services. With a staff structure that combines chartered professionals with talented engineers, geologists and scientists, we offer high-calibre expertise with the client focus and service of a flexible and responsive business. Our staff complement has grown and we now have ten permanent and three retained specialist consultants. We aim to consider the full life-cycle of a scheme from feasibility to construction in order to provide best value for the client.

Dr Peter Arnold and Alan White set up Red Rock Geo to provide a focused client led approach offering services based on their collective national and international experience. Since its entry to the market, Red Rock's work has been primarily focused on dealing with complex or unexpected ground conditions. We have a recognised capability to translate experience of similar projects to new challenges and this enables us to respond quickly with a variety of options to address problems encountered by our clients. This has proven to be our unique selling point. Our areas of expertise include brownfield site assessment and remediation design, foundation design of tall buildings, coastal cliff stability assessments, and sustainable earthworks. The following projects demonstrate our ability to diversify and reach new markets in order to grow the business.

FACTS ABOUT RED ROCK GEO

- Consultants in land stability and brownfield remediation
- Specialising in complex and difficult sites
- Established in 2011 funded with government backed EFG loan
- 10 permanent staff with 50% being female engineers
- £1 million turn-over
- Work throughout UK
- Accreditations: AGS, SMAS, CHAS, BS EN ISO 9001:2015, Constructionline.

Cliff Stabilisation works, Devon

> "Red Rock Geo has a recognised ability to translate experience of similar projects to new challenges"

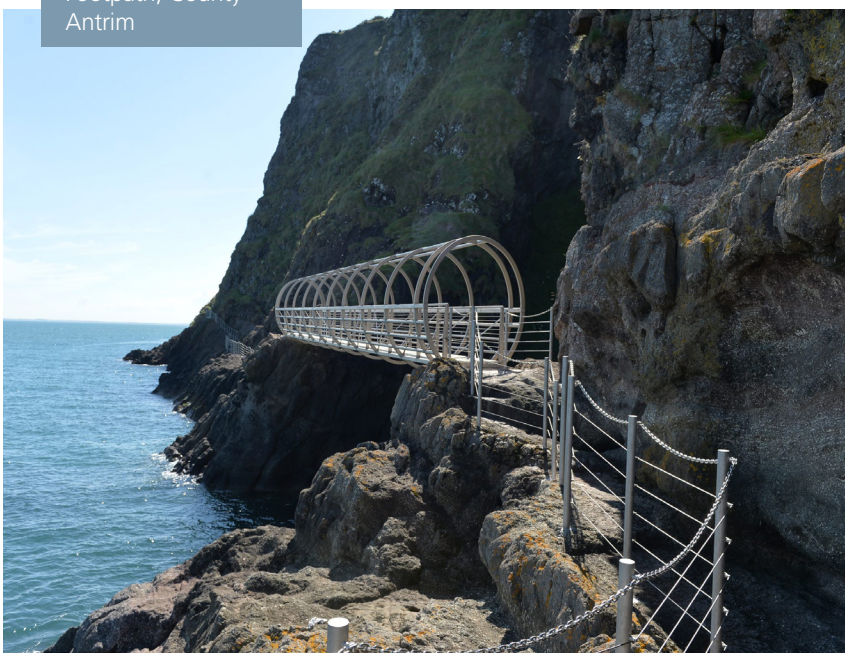
Managing Risk

The geological performance of the ground often presents the greatest uncertainty in most projects, particularly those involving steep slopes. While slopes engineered for major infrastructure projects may require extensive stabilisation works, on natural slopes such measures are often less appropriate. Many organisations that allow public access to the natural environment have to find ways to balance people's enjoyment of the outdoors with their safety.

Red Rock Geo has developed unique risk management approaches to ground instability problems. We have successfully applied these to many projects so as to enable geotechnical risks from the natural environment to be appropriately quantified.

The Gobbins Coastal Footpath in Northern Ireland comprises a man-made footpath that traverses along the base of spectacular 60m high sea cliffs. Originally developed in the early 20th century, the path later fell into disuse as times changed and damage occurred to structures. The path was reinstated to reflect as much of the original detail as possible, with intricate bridges and walkways spanning hidden coves and winding below the majestic basalt slopes. The cliffs are an Area of Special Scientific Interest with the rock ledges being important nesting sites for various seabirds including kittiwakes, fulmars, razorbills, puffins and guillemots. Recreating that early, untamed experience for the visitor within Health and Safety guidance was imperative for the attraction's success. Therefore, the Council Members of Mid and East Antrim Borough Council required a risk assessment and management plan that permitted an environmentally managed approach to address the risk of rockfall to both public and staff. In this sensitive environment, any stabilisation works undertaken to minimise the risk to the public from natural hazards, in particular rockfalls, had to be sympathetic to the cultural heritage of the site and all aspects of the natural environment.

Rockfall risk assessments at the Gobbins Coastal Footpath, County Antrim



Red Rock Geo recommended that the level of rockfall risk to the public should be determined and considered in terms of other risks the public face in daily life utilising the HSE's risk tolerability principles. This approach allowed the Council to make an informed decision on the risks people face using the footpath and to determine what measures are needed to further reduce and manage the hazards. A programme of environmentally proportionate stabilisation works is currently being implemented, including controlled removal of loose rock blocks, targeted positioning of rock bolts and protective mesh, and, in places, the installation of rockfall catch fences. These measures, combined with daily monitoring, maintenance and progressive rockfall management, has allowed the path to partially open for the summer season in 2017 and be fully open in 2018 for the visitor to experience this truly unique and breath-taking asset of Northern Ireland.

Highly contaminated brownfield site, London

Inspection for asbestos in soil, Cornwall

Innovative Solutions

In 2016 Red Rock Geo was commissioned to undertake a high-level feasibility study into the potential use of in-situ grouting methods to encapsulate and immobilise legacy radiological contamination, specifically within structures that are part of the decommissioning treatment of nuclear power stations. We conducted a detailed review and evaluation of grout characteristics to determine the optimal treatment methodology within the spatial and environmental constraints of the working area. This included the development of an ex-situ grouting trial using mock-ups of some of the structures to demonstrate that the level of treatment required could be achieved.

Managing the Asbestos Legacy in Soils

In 2012 the contaminated land industry was dramatically changed when the Control of Asbestos Regulations were updated to include asbestos contamination in soil. It became increasingly challenging for public health officers to agree remediation standards without external guidance on threshold concentrations for asbestos fibres in soil. Red Rock Geo undertook extensive research of published data and other methodologies used worldwide to determine a tolerable level of risk.

The resulting risk model produced was accepted by local authority regulators as a soil remediation standard for similar sites, and is now accepted throughout the southwest as a best practice approach for investigation and remediation of asbestos in soils. It was our understanding of the broad range of stakeholder concerns that allowed an effective, yet economic, solution to be embraced by regulators in the earliest days of the new legislation. As a result, Red Rock Geo is contributing to the development of a smartphone app to assist the land development sector in identifying asbestos in soil.

Outlook

Our business sector faces numerous technical and commercial challenges. There is a shortage of appropriately trained design engineers and we are working to improve the development of undergraduates by our student placement scheme. Furthermore, there is a move towards technical self-regulation in the ground engineering sector, and it is increasingly important that our clients are informed of best practice. While Red Rock Geo has the strength to overcome future uncertainties in business confidence, we are nevertheless very sensitive to, and plan for, changes in the economic climate.

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