

# Observational Method Guidance

An update to CIRIA guide R185



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## About CIRIA

CIRIA is the Construction Industry Research and Information Association, a neutral, independent and not-for-profit member organisation.

Our vision is to be the leading enabler and preferred partner for performance improvement, to drive collaboration across the built environment and construction sectors to research, develop and transfer knowledge.

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## CIRIA Products

CIRIA delivers robust, authoritative and independent good practice guidance applicable across sectors and designed for a range of users, from policy makers to practitioners.

Our guidance is developed collaboratively with industry and academic experts. Our methods ensure consensus, quality and the latest thinking underpin everything we do. Our work contains case studies to share knowledge and illustrate practice through examples.

We raise awareness of our good practice guidance through training, events, communities of practice, social media, blogs and press releases. Key messages from our projects are widely disseminated to help embed good practice into industry.

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## CIRIA Research Ambitions

CIRIA's 60+ year history and future purpose are aligned to our ambitions, designed to make a tangible difference to the sectors in which we work. We take a holistic, systems-based approach to critical industry challenges within our 5 core research ambitions.



Embedding  
Sustainability



Achieving Net  
Zero Carbon



Increasing  
Resilience



Improving  
Delivery



Harnessing  
Innovation

# Observational Method

An update to CIRIA guide R185

## Justification

The design of geotechnical structures such as deep excavation and tunnels is based on the strength and deformation parameters of the surrounding soil, and the planned sequence of construction activities. Uncertainties can exist around the soil parameters as well as the construction method (e.g. material properties and measurements) actually implemented. To allow for some of these uncertainties, conservative designs are often proposed that tend to be material intensive. Through monitoring, design predictions can be compared with measured performance. Trigger values are often provided to pre-define actions in case of exceedance. Generally no allowance is made in the design to make it more efficient if measured performance is better than predicted.

The Observational Method (OM) is a framework that allows adjustment of the geotechnical design during construction based on monitoring data. Observed movements of the structure and surrounding soil can be used to supplement predictions using real time back analysis to update soil parameters and construction method. As such, using the OM can contribute to minimising the use time and material whilst ensuring safe construction, enhancing the sustainability of the overall project.

Since the publication of CIRIA guide R185 in 1999, design standards have been updated. Eurocode 7 explicitly permits the application of the OM. The increase of computing powers opens the possibility for real time back analysis. Through optimisation of material use, applying the OM can contribute to Net Zero goals and it can be expected that the OM will be applied more often. As such, guidance is required to establish for each project whether using the observational method is feasible and to describe the responsibilities of the different project contributors to ultimately save costs, material, and time.

## Proposal & Products

CIRIA proposes to update R185 and develop a new leading good practice guidance on the application of the OM in geotechnical projects.

The project will bring together geotechnical engineering consultants, contractors, clients and suppliers who will benefit from a coherent approach for the use of OM that is in agreement with current standards. It will discuss all relevant topics ranging from the required monitoring regimes to allow for reverse analysis of soil parameters to required variations in contracts to enable a successful implementation.

The new guidance will contribute to efficient and safe construction practices that emphasise sustainability and minimise the carbon footprint of geotechnical structures.

## Scope

Following CIRIA's established procedures for developing good practice guidelines, the final scope of the guidance will be developed together with the project steering group (PSG) once established. Starting from the structure of the original guide, main topics will include:

- contractual requirements to enable implementation
- required monitoring regimes
- data base management, and
- real time back analysis and the potential for automation of decisions,
- management of risk and uncertainties
- Eurocode developments

The guidance will be developed in collaboration with ISSMGE Technical Committee 206, Observational Method, and present relevant case studies that will be collected worldwide and cover the range of potential applications of the OM including retaining walls, tunnels, and nailed slopes. It will be fully compatible, aligned and directly reference current Eurocodes and CIRIA guides such as C760, Guidance on embedded retaining wall design.

## Indicative Timeline



# Why invest in a CIRIA project?

The benefits to your company from contributing to our projects

## Our reputation

Our reputation in the industry is long established and widely recognised. The principles of quality, sustainability and collaboration have been a foundation for what we do for many years.

## Our downloads

Our Guidance is downloaded over 50,000 times per year



## Our reach

Our members and downloads span over 50 countries worldwide



## Your benefits

The benefits of being involved in a CIRIA project are various:

- Deliver significant corporate value for modest levels of investment.
- Raise awareness of your corporate brand through logo on outputs and submission of case studies and content.
- Network with peers, clients and thought leaders in the sector.
- Get your message heard and influence industry direction.
- Demonstrate tangible leading contribution to improvement in the sector, fulfilling ESG goals
- Provide CPD for your staff, aiding routes to chartership and personal career growth
- Assist future work winning through involvement with industry leading good practice

# Want to know more?

## CIRIA Research



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