

Geotechnical Slope Drainage

Developing guidance on the design, construction and maintenance of slopes in a changing climate



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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.

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.

CIRIA Research Ambitions

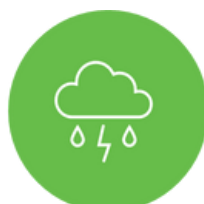
CIRIA's 60+ year history and future purpose are aligned to our ambitions, designed to make a tangible difference to the sectors in which we work. We take a holistic, systems-based approach to critical industry challenges within our 5 core research ambitions.



Embedding
Sustainability



Achieving Net
Zero Carbon



Increasing
Resilience



Improving
Delivery



Harnessing
Innovation

Geotechnical Slope Drainage

A Guide for the Design, Construction and Maintenance of Slope Drains

Justification

Geotechnical slope drainage plays a critical role in ensuring slope stability and the mitigation of surface water runoff and/or ground water based failure events. National Highways have identified that 74% of geotechnical failures on their network are linked to drainage being a root cause. This is replicated across the UK infrastructure network making drainage issues the single most significant cause of network disruption, costing the UK £m in economic losses and repair.

Tragically, fatal events are linked directly to failures related to slope drainage issues. Climate change is likely to further stress existing installations and traditional design approaches, with the likelihood of an increase in disruptive and/or catastrophic events on British and Eire national infrastructure networks.

It is now recognised that slope drainage is likely to have a significantly shorter design life than that mandated of the design of the slope itself. This presents a tension between the overall slope design and the slope drainage design. Slope drainage design, performance and life span is heavily influenced by geology and geohydrology. Changing climate, combined with sustainability and carbon targets mean that slope drainage requires updated guidance.

Proposal & Products

CIRIA is proposing to develop leading good practice guidance on the design, specification, construction, post-construction operation and maintenance of slope drainage systems applicable across the infrastructure landscape in Britain and Eire and beyond.

The project will address all forms of geotechnical slope drainage systems bringing together current research knowledge, industry good practice, experience from owners and operators of linear infrastructure, to create unified guidance

The new guidance will actively contribute to responding to the recommendations of Rail Accident Investigation Branch accident report on the fatal Carmont rail derailment, where severe rainfall and standardised drainage solutions were the cause of the landslip which resulted in a train derailment and three fatalities.

Scope

Slope drainage applies to both embankment and cutting drainage and includes but is not limited to Slope, Counterfort, Herringbone, Crest and Toe drains. The causes of slope failures where drainage is foundational are broad and include, design, specification and construction with a significant influence post construction drawing in handover processes, inspection and maintenance.

The guidance is likely to address:

- Design standards and unified design approaches
- Specification of materials, construction and practice
- Site assessment of geology and geohydrology and the impact of changing weather patterns, climate change extreme weather events – particularly, rainfall, drought and elevated temperatures
- Toe drainage and structure scour events
- Designing for maintenance
- Minimum design data requirements and records
- Appropriate checking / approvals and handover processes
- Practical construction and construction progress inspections and signoff
- Materials certification, proof testing and record keeping
- Maintenance/performance inspection regime and frequency
- Maintenance minimum inspection data, record keeping and format
- Records of maintenance construction activity – records, data and format
- Handover maintenance inspections – regime, records and format

The new guidance will be fully compatible, aligned and directly reference recent CIRIA guidance on Natural Slopes and Geotechnical Baseline Reporting

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



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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