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Time Capsule

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Study of the efficiency of site investigation practices (PR 60)

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Introduction

This report, published in 1994, presented a revealing study into Department of Transport (DOT) highway project costs and their relation to site investigation. The need for the study was highlighted by the National Audit Office (NAO) report 'Quality control of road and bridge construction' published in 1989. A specific report by the NAO followed in 1992 (Contracting for roads) which included discussion on cost increases due to geotechnical difficulties. PR60 quantified how, on an outer bound, increasing the site investigation process leads to avoidance of increased construction costs. About the same time, the ICE created new Working Parties to raise the profile of site investigations and provide new contract documents for the broader industry. It was a major drive over several years.

The research

The research followed two lines of inquiry to assess contemporary site investigation (SI) efficiency. The first looked at records of recently completed projects (58 No.) to identify geotechnical factors that have caused past cost increases, and how these were related to SI. The subsequent line of inquiry investigated the effect of recent changes to SI requirements which may have corrected these increases, and if any further changes were required.

The research revealed that half the survey projects reported outturn cost increases exceeding 23% of contract tender value and only a quarter showed increases less than 10%. It was shown that half the increases were of geotechnical origin. Preliminary studies were generally reported as poor. At a significant number of sites, a level of expenditure on site investigation between 1% and 2% of tender value appeared to be adequate.

From this work three key geotechnical difficulties could be identified a leading to cost increases. These were: seepage and groundwater in cuttings; classification of materials not being as anticipated; and greater extent of unsuitable materials below formation. Many changes to SI documentation had been made by the DOT since the completion of the studied projects and the industry was beginning to employ Quality Assurance procedures to improve reliability of SI.

The importance of the work

This in-depth financial study is extremely useful as a milestone for how the industry was performing. It was at a time when SI was being examined and its importance raised so it provided the data and knowledge in support of SI. It assisted greatly in confirming changes that had already been made and implementing them more widely. But critically it continued to raise and support the importance of SI at a time of considerable activity within the SI and main works industry.

As a time capsule entry, it describes the state of the industry at the time of the projects studies, and provides a listing of areas of concern which future generations need to address. In this case the recommendations made in 1994 were: greater geological input at the planning and interpretation stages; better investigation of cuttings; investigation of scheme

changes and review; and collection and feedback to a central database of records, to allow up to date communication to planners and designers. It will be for future generations to decide whether these four recommendations have been heeded.

Reference

Mott MacDonald and Soil Mechanics (1994). *Study of the efficiency of site investigation practices.* Project Report 60. Transport Research Laboratory, Crowthorne, Berkshire, UK.