Book review

Reuse of foundations (C653). T. Chapman, S. Anderson and J. Windle. London: CIRIA, 2007. 52 pp. ISBN-13: 978-086017-653-4; ISBN-10: 0-86017-653-3. £60

Modern civil engineers have an awareness and responsibility to design and construct buildings and structures in the spirit of sustainable development. Reusing existing foundations fulfils part of this remit. It is a desirable and often necessary approach to new urban developments. The guide described here follows from the best practice handbook, produced as part of the 'Reuse of foundations for urban sites' (Rufus) project coordinated by the Building Research Establishment (BRE), which was also reviewed in *Géotechnique* (McNamara, 2007). It is a condensed version of the BRE handbook, summarising the main points, and is presented in a very readable way making it readily accessible to all parties potentially involved in projects where foundation reuse is being considered (e.g. developers, funders, designers, contractors). Many of the authors and parties involved are common to both books.

The guide summary begins with the statement: 'the reuse of foundations for a second superstructure is technically feasible and increasingly becoming part of standard practice'. Although the focus is very much on piles, it is noted that the same principles apply to shallow foundations. What it contains are many of the factors, both adverse and advantageous, that should be considered when assessing the possibility or need to reuse existing foundations. Practical and technical problems of reusing foundations are reviewed and strategies suggested for reducing risk, taking into account the differences between the design and construction of new and existing foundations.

The chapters are short and punchy, which facilitate a quick and efficient read when embarking on such a project, while retaining the high quality associated with CIRIA publications. The concise nature will appeal to less technical readers while at the same time sufficient detail is provided to allow a serious appraisal of what needs to be considered, along with references for further study.

The introduction starts with a number of questions and answers about the scope of the guide and what appear to be 'frequently asked questions'. This is helpful background information for those unfamiliar with the concept. There is also an interesting section giving a historical context – an eye-opening example is: 'In Elizabethan times in London (1558 to 1603), in an attempt to curb urban sprawl, new building was only allowed if it were raised on "old foundations"'. Four options for new developments are described and discussed in terms of energy required in the short and

long term. They are also referred to later, making comparisons, for example in terms of risks, reliability and economy.

'Requirements for any foundation' is the subject of the second chapter, reiterating what engineers would usually have to think about but in the context of 'second-hand' piles. Emphasis is given to the close collaboration needed between geotechnical and structural engineers.

Chapter 3 discusses how foundations can be reused, considering aspects such as compatibility, load capacity, cost and risk. It is noted that 'the perceived risk of pile reuse is often greater than the actual risk' with in some cases developers preferring to build new foundations rather than taking the risk of reusing piles.

'Technical considerations for reuse of old foundations' are the subject of chapter 4, covering topics such as background desk studies, assessment of current state of foundations, monitoring to verify performance, field investigations (i.e. which influencing factors to identify), foundation performance and selection of new design capacity relative to working capacity. Much emphasis is placed on checking the performance of the foundations during their former life supporting the previous structure.

Chapter 5 looks forward, discussing what ought to be recorded and stored regarding new piles along with considerations concerning their design so that they can be reused in the future. The use of 'smart' foundation structures is covered briefly. It is pointed out that monitoring of a newly constructed structure is sometimes viewed with suspicion by building occupiers, who think that this is a reflection that something is amiss with their building.

The final chapter lists questions a developer should ask when contemplating foundation reuse, again containing very useful guidance and insight.

One of the issues mentioned (chapter 5) is that currently there are no guidelines or requirements on the content and preservation of records concerning foundations that would aid their future reuse. This very useful guide goes a long way to addressing this need and explains in a very clear way the main issues that need to be considered from a variety of viewpoints. It is a good and interesting read and, along with the BRE handbook, provides a solid reference to enable us to head towards better sustainability in terms of reuse of foundations.

REFERENCE

McNamara, A. M. (2007). Book review. Reuse of foundations for urban sites: A best practice handbook. *Géotechnique* 57, No. 7, 636.

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