

**Development of Micropile
Codes in UK, *Mark Hinton,*
Balfour Beatty Ground
Engineering, UK**

Mark Hinton

BEng (Hons), MSc (Eng)

Head of Business Development

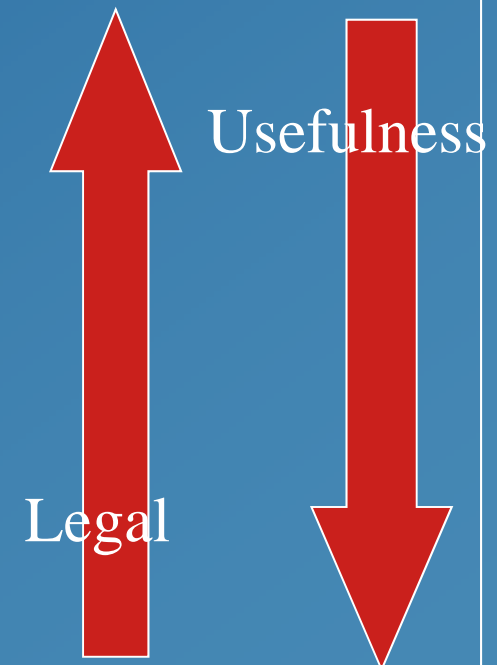
The Current Situation UK

- In general terms we refer to specification documents in the following order

Particular (Project) Spec

SPERW – Specification for piling and embedded retaining walls 2nd 2007 published by ICE Institution of Civil Engineers

Eurocodes (as from March 2010)



The issues in UK

- SPERW spec is a good useful document in a useable format. It has associated guidance notes (similar in some ways to FHWA Micropile Design and Construction) – But SPERW does not cover Micropiles
- Eurocode BSEN 14199 Execution of special geotechnical works, micropiles – reasonable base document but patchy in terms of usefulness

The Big Issue

- The enemy is poor workmanship and installation practices
- We are not short of design codes although lack of micropiling ‘flavour’ (i.e. post grouting etc. not really covered)
- One Job/Rogue Contractor can ruin the reputation of the fledgling micropile industry
- How can we ‘raise the bar’

Example SPERW Vs EN 14199

B4.4.6 – Lengths of auger shall not be split during auger extraction other than where permitted in the Project specification. If a methodology is used that requires the splitting of augers, total concreting time per pile shall not exceed 1 hour. When constructing a pile using the split auger method, the concrete levels shall not be permitted to fall lower than the auger joint such that the fresh concrete shall overspill the joint as the auger lengths are split. The auger joint shall be at least 1m above commencing surface level.

Sperw Guidance continues..

Where headroom is limited it may not be possible to construct bored injected piles without installing and removing the auger in sections. This technique may offer the only viable solution in some situations.....difficult to provide a fully automated system...manual system may be permitted...Careful control of the construction process, and in particular the concrete supply, will help to minimize the associated risks to acceptable levels.....

Etc. – the point is topics are covered in good detail and good practical advice and guidance given

BS EN 14199



8.4.1.7 The drilling method to be used shall be decided by **taking care** of all requirements of soil and foundation conditions, and **in such a way** that the designed length can be reached and that a stable borehole and the intended cross section is created over the entire length.

8.4.4.1 Drilling with continuous flight augers shall be done in accordance with 8.1.5 of EN 1536:1999

So.. Somewhat vague, brief and tends to be a lot of x refs to other codes – lack of practical guidance – has some other content issues

SPERW and BSEN 14199 Current Status

- SPERW – not due for revision any time soon but perhaps could be revisited if a need identified
- BSEN 14199 in UK coming up for review – FPS/EFFC technical groups involved
- Codes seem to be reviewed on a 5 year cycle approx.
- For BS EN 14199 – now is the time for ISM to play a part. But do we need more SPERW type guidance format advice in addition akin to FHWA?

Definitions an issue

- FHWA typically less than 300mm; drilled, grouted non-displacement; steel resists most or all of load – Case 1,2 Types A,B,C,D
- BSEN14199 must be 300mm or less or displacement less than/equal to 150mm; grouted, mortar or concrete; Can be partially unreinforced if in compression
- SPERW – apart from CFA with auger split and inferred refs to smaller diameter piles not really covered – also grout is covered as a material

Definitions an issue

- What is pile Vs minipile Vs micropile?

Discuss !

In UK I would argue we have an identity crisis

Personal view – diameter should not come into it

The Challenge ahead

- Identify need – what type of document (s)
 - Update and add to existing e.g. BSEN 14199
 - Do nothing? Let the market decide
 - Create a new document (s) e.g. a UK version of FHWA?
 - UK/European/Global
- Get expert group together
 - Probably enough ‘volunteers’
 - European/Global moderation?
- What flag do we fly under? ISM FPS DFI ADSC
EFFC ISMGE
- Get it done !

The Challenge ahead

- Finance it
 - SPERW model use ICE publishing arm
 - also BRE produce guidance docs for FPS
 - Client organisation sponsor support e.g. Highways agency
- Get it adopted and in common usage
 - If useful will get used, current vacuum
- Avoid conflict with other documents e.g. BSEN14199
- Review and Maintain – ongoing process
 - Every 5 years?

What can we learn from others

- How have other countries dealt with?
- How is FHWA doc used in U.S.
 - In common usage?
 - Contractual document?
 - Hierarchy with other codes and guidance?
- Canada?
- Germany?
- Australia?
- South Korea?

The ISM role

- Is this what the ISM is for?
- Can it/should it play a role?

Thank you for your time

