

Cross-Hole Sonic Logging viability – Purpose of question

(Nothing personal. I've just not heard a convincing argument 'for' yet)

1. To open the debate regarding sonic logging. Is it a viable test
2. To highlight alternative test methods and promote a potential validation process.

Where did this start?

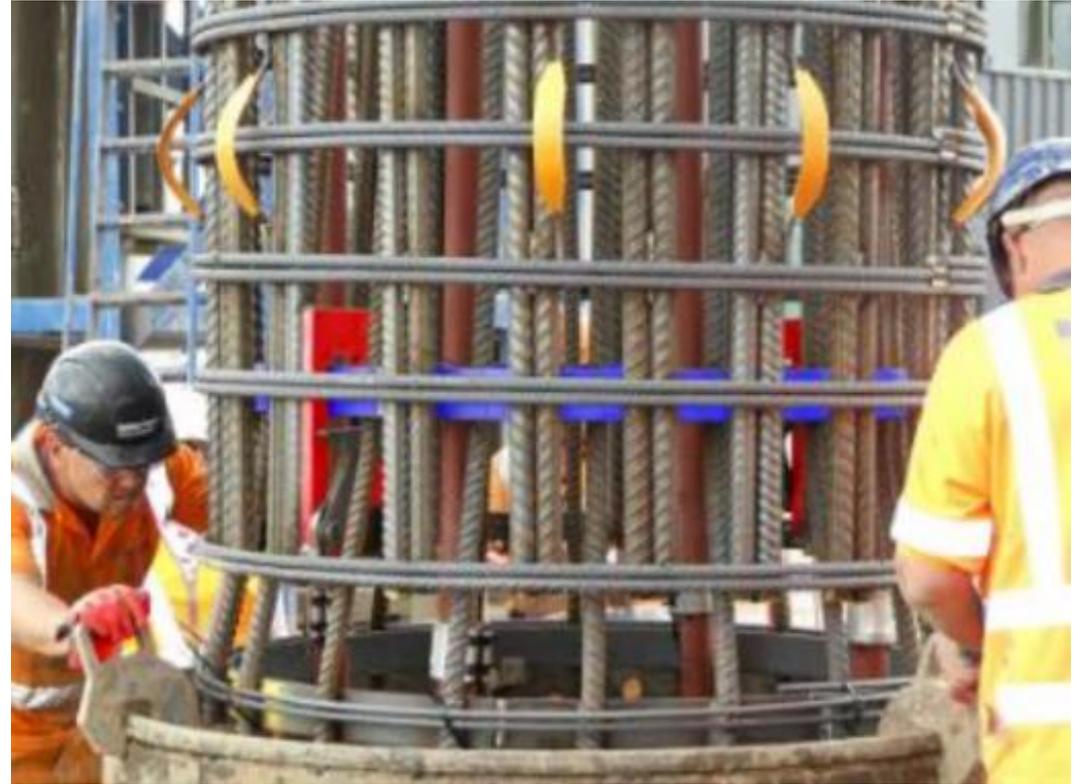
In 2017 I highlighted the potential risks associated with the coupling of sonic logging tubes in bored piles. The members and our supply chain have made great strides in the elimination of hands in cages to couple multiple section cages, but it is still prevalent in sonic testing.

We surveyed the membership for accidents and near misses between 2010 and 2017. A large number of very serious incidents were reported including lost fingers, thumbs, facial injuries and even potential RTAs.

In one case the top cage section slipped unexpectedly and knocked the stilsons downwards at speed, pulling the users hands into the cage. In the preparation of this article one FPS member reported 3 serious injuries and 39 hazards, near misses and safety observations related to sonic tubes in the past 6 years. Another recalled 4 serious hand injuries from three linked projects, including a lost finger and broken bones.

Nothing really changed. Some members highlighted different couplers, others wanted to differentiate base grouting tubes from sonic logging tubes.

There are different couplers available but....



We questioned the test outcomes 2015-2021 and found the following

Piles on project	D-Wall Panels on project	Nr Tests	Nr blocked tubes	Nr Anomalies detected	Investig'n	Nr requiring remedial work
	26	26	8	6	Des rev	0
	30	10	3	3	Des rev	0
	16	4	0	4	Des rev	0
	21	5	0	2	Des rev	0
61		44	2	0	Des rev	0
464		172	1	3	Des rev	1
16		16	0	7	retest	0
13		13	0	6	retest	0
489		345	4	50	core	0
566		133	4	16	core	0
268		54	0	2	core	2
1877	93	822	22	99		3

Are the tests causing the anomalies?

One member tabled a concern that the sheer amount of reinforcement, tubing, brackets, stirrups and couplers in the pile were trapping clay and bentonite.

3 instances recorded. Note reinforcement is a stirrup to retain the sonic tube. Coring flush water has removed whatever soft material was trapped at the anomaly level.



Context and alternatives

The table in slide 4 records approximately £2 million of cross hole sonic logging.

Perhaps 100 km

Or...900 tonnes

Or...£1 million of steel tubes

With the attendant risks associated with installing the tubes, which are potentially causing the anomalies which are detected....To identify 3/822 instances requiring remediation...Which almost certainly would have been detected by alternative means.

There are validated, more sustainable alternatives available such as TIP testing

Visual inspection in a dry bore, prior to concreting

Rigorous record keeping during construction and concrete testing regime

Question

What could the FPS Technical Committee do to validate and promote safer, and possibly more effective, alternative test methods for large bored piles?