



Integrity evaluations on piles which have been capped

Occasionally, piles are capped prior to integrity evaluations being undertaken. Can they be tested with the caps in place ?

Caps which incorporate a single pile can be evaluated. If the cap is the same diameter as the underlying pile, there would be no effect on the test data. As the cap size increases, a proportionally larger amount of the downward travelling vibration wave is reflected back to the pile top. This serves to reduce the amplitude of the downward travelling vibration wave which in turn reduces the effective penetration of the tests. A cap / pile area change of about 2:1 (ie. a 600mm diameter cap on a 400mm diameter pile) would result in about half of the downward travelling vibration wave being reflected back to the pile top. A cap / pile area change of 4:1 would result in all of the vibration wave being reflected from the cap base. In this instance, no integrity assessment of the pile shaft below the cap would be possible.

For caps which incorporate multiple piles (and also ground beams), it is not possible to obtain any integrity information relating to the individual piles by undertaking the tests from the top of the cap or beam. This is because the measured data comprises the flexural response of the pile cap only.

Occasionally, piles have been exposed beneath the base of the cap and horizontal notches or ledges have been cut into the pile shaft to facilitate a test. The test data obtained under such circumstances is significantly affected by the presence of the overlying pile cap. Sample tests undertaken on sub-cap piles with notches introduced have been carried out. These indicate that the effective penetration of the tests may be as little as 2-3 pile diameters beneath notch level only.