

Cross-hole Sonic Logging (CSL)

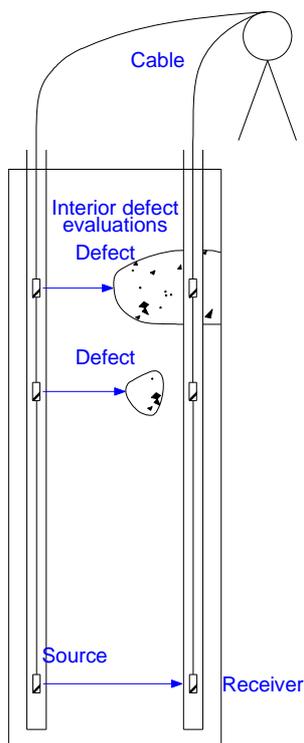


Diagram illustrating the technique

Cross-hole Sonic Logging (CSL) is a test used to establish concrete integrity. The CSL test involves lowering ultrasonic probes through access tubes along the length of the foundation element and as the probes are pulled to the surface a data processor records the passage of ultrasonic pulses from a source/transmitter in one tube to a receiver in another tube (see diagram).

Recordings are made at depth intervals typically on the order of 5 cm as the sensors rise. The tubes may be steel (recommended) or PVC plastic that are nominally 38 to 50 mm ID.

Where the energy transferred is relatively constant and/or there is little change in the transit time detected with changing depth, one can interpret that the acoustic parameters of the concrete between the tested tubes are generally uniform.

Potential defects are indicated by delays in signal arrival time (slower velocity) and lower energy at a given depth and are easily seen on screen to promote further detailed analysis where required.

ADVANTAGES

A key benefit of employing Fugro personnel to perform CSL testing is our wealth of experience and understanding of both the physical limitations of the testing technique as well as pile/barrette characteristics likely to cause anomalous responses.

APPLICATIONS

The acoustic non-destructive evaluation of concrete can be performed in foundation structures of various geometries, from cylindrical piles to diaphragm walls, slurry walls or barrettes. Up to 8 m of concrete can be traversed (although at decreased resolution), more typically 2.5 - 3 m would be a general spacing recommendation between access tubes.

CSL tests are particularly well-suited to larger foundation elements and can provide a means of testing the concrete integrity where low-strain impact integrity testing from the top of the pile may fail to be effective.

Crosshole Sonic Logging can be carried out on piles scheduled for traditional static loading by top-down load application or bi-directional testing using O-cell[®] technology.

SYSTEMS AVAILABLE

Fugro has at its disposal several different leading CSL systems available throughout the world. If your specification requires a particular equipment type, we would be pleased to advise regarding suitability and resolution.

CONSULTANCY

Among our staff are some recognized experts in the field of CSL testing who can be engaged as to assist with the interpretation of anomalous results if required.



Test in progress



CSL Equipment from PDI