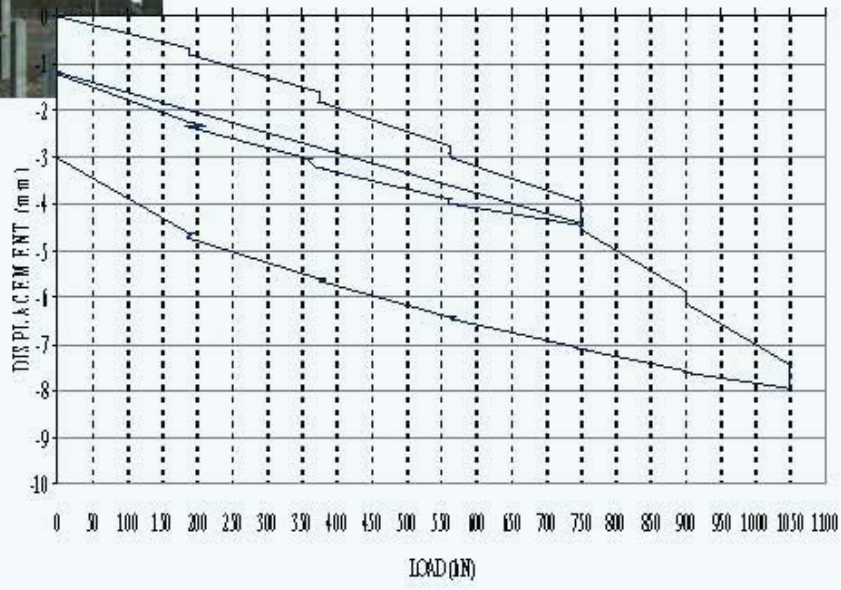
Federation of Piling Specialists

Handbook on Pile Load Testing



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Test Type	Reaction System	Maximum Test Load	Advantages	Disadvantages
Static Maintained Load (MLT)	Reaction piles (Rock anchors may provide an alternative reaction system for piles end bearing in rock) Kentledge	30MN (generally) 3MN (generally) In both cases higher test loads are possible.	Suits all soil conditions and pile types. Manual and automated systems available. Piles can be instrumented. Tension and lateral testing possible.	Reaction piles/kentledge and frame are required. Kentledge tests are relatively expensive. Setting up and dismantling the test equipment involves operatives working at height. Long duration.
	Bi-directional load cell	27MN per cell	Very high test loads achievable. No reaction system required.	Relies on sophisticated pile instrumentation and analysis. Suits bored piles only. Relatively expensive and long duration.
Static Constant Rate of Penetration (CRP)	As for MLT	As for MLT	Suits all pile types. Manual and automated systems available.	Reaction piles/kentledge and frame required. Kentledge tests are relatively expensive. Limited to cohesive soils. May over predict ultimate load.
Rapid Load Test	Combustion chamber	30MN	No reaction system required. Fast test.	May require calibration with static test. Caution required in cohesive soils and in chalk. Unsuitable for piles in excess of 40m deep. Suitable for testing pile groups and piles of variable or unknown pile shaft profile, e.g. CFA piles or re-used piled foundations.
Dynamic	Piling hammer or separate drop weight	3MN (generally, but can be greater) Hammer weight should be in the range 1 to 2% of load to be proved.	Fast and relatively inexpensive. Suitable for both driven and bored piles. Correlation with static tests on bored piles generally good.	May require calibration with static test. Results may be unrepresentative in soils that exhibit relaxation (reduction of end bearing in Coal Measure Mudstones for example). Correlation of dynamic and static results on piles in cohesive soils and chalk must consider time-related effects and the length of pile tested.