

LOADTEST

Singapore Supreme Court Building



Project Supreme Court Building
Location Singapore, Republic of Singapore
Client Sato Koyo Pte Ltd
Period 2000
Foundation Contractor ZAP Piling Pte Ltd.
Project Description



Placing cages within piles constructed in existing car park



Testing within an existing parking garage

For the new Supreme Court building in Singapore, an existing building with four basements needed to be removed. Zap Piling Pte Ltd performed the bored piling for Sato Koyo Pte Ltd (general contractor), and LOADTEST Asia Pte Ltd performed the Osterberg Cell® testing. The piling work was done from temporary steel decking at ground level through hacked access holes in the existing basements slabs down to the existing basement floor (16-m below ground). 255 new bored piles with an inserted H-pile (“king post”) with diameters 1400-mm needed to be constructed.

A proof load test inside the existing building using the Osterberg cell (O-cell) method was preferred since this method requires no reaction system at the pile head like conventional methods and was the only method available for performing static maintained load tests to 2,400 tons on the working piles.

The O-cell method works by installing the O-cell inside the bored pile prior to installation and casting of concrete. During testing, the loads applied by the O-cell act in two opposing directions, resisted by the capacity of the pile above and below (hence no external reaction system is required). The patented and award-winning method is simple in its concept but requires expert assistance for successful execution. The cages are instrumented and prepared prior to installation with the O-cell assembly, mechanical extensometers and strain measurement devices. Prior knowledge of the soil parameters and scope of testing is used in determining the O-cell level in the pile. If a preliminary test is performed, a multi-level test (using two O-cell assemblies at different levels) is typically performed.

This allows for testing to ultimate capacity of the complete pile (side friction and end bearing). Since the method automatically separates the lower pile section (including end bearing) from the upper pile section, it is often possible to gain more accurate information about the pile shear and end bearing capacities. The method can be adopted to test a great variety of pile foundations but is typically used on bored piles for its ease of use.

In 1999 a 15,000 tons static maintained load test was performed for the MRT-NEL in Singapore on a 2,200-mm diameter pile founded in soils. It is believed to be the highest load ever applied on a load test in Asia.

Besides testing building foundations LOADTEST Asia has used the O-cell method on testing foundations for large infrastructure projects like bridges and rail lines in Asia. These include the Taiwan High Speed rail line, KCRC West Rail in Hong Kong, MRT-NEL in Singapore, My Thuan River Bridge (cable stay) in Vietnam, Bandra Worli Sea link (cable stay Bridge) in Mumbai, India and Bridge projects in remote areas of Bangladesh like the Rupsa Bridge and Paksey Bridge. In offshore construction works and high capacity and non-redundant foundation works, the method has been used for years.

The O-cell method is also starting to be more popular in less challenging foundation works. The increased pile diameters and capacities in general construction works and the benefit of added safety and less site constraints are some of the reasons the method is slowly being adopted on these building projects more often.



Source: iac.gov.sg

