Instant SCREW PILING

CASE STUDY No 3:
TENSION PILES FOR HYDROSTATIC LOADS

Client: a Joint Venture of Shell Petrochemicals and CNOCC (China National Offshore Oil Corporation)

Location: Daya Bay (China)

Situation: Design, and supervise the installation of foundations to overcome uplift in a large concrete discharge basin

Project Manager:

BSF (a joint venture of Bechtel, Foster Wheeler and Sinopec)

Ground

gravel overlaying clay layers, overlaying extremely weathered mudstone of variable depth

(Above)
Static piling rig

Solution

The $US4.5B Shell Nanhai petrochemicals project will be the largest plant of its kind in the world. The high water table under the massive 110m x 10m, 6-metre deep discharge basin applies considerable hydrostatic uplift on the base of the basin.

Instant Screw Piling was called upon to devise a foundation that coped with pile tension loads of 350kN and compression loads of 400kN. The solution was one-piece screw piles, between 12 and 15 metres deep, with twin 700mm diameter helixes at the base. This was the first application of screw piles in China.

Because of the presence of large cobbles (200-900mm in diameter) in the upper four metres, a 600-tonne static piling rig was used to pre-form a 500mm diameter, four-metre deep pilot hole for the screw piles.

Once the screw piles were installed, the void surrounding the piles was backfilled with concrete.

(Above)
The vast size of the sediment basin is clearly shown

(Left)
Testing piles

(Right)
Electric rig installing screw piles