

## Efficiency of Prestressing Heads

by Anthony (Tony) Barley Single Bore Multiple Anchors Ltd., Harrogate, England

*The following item was received from one of our ADSC Technical Affiliate members in England. We welcome comments from our members and readers on articles presented in Foundation Drilling magazine. (Editor)*

I read with great interest the results of the investigation work recently carried out by ADSC Anchored Earth Retention Committee (Foundation Drilling magazine, Dec/Jan 2005 issue)

We have carried out a considerable amount of inspection and exhumation of anchor heads over a 30 year period including reporting on failed anchors and structures. This research has concluded that



Photograph 1. Corrosion effects

prestressing heads, whether multi-strand or monostrand, can only work with maximum efficiency when the two main interfaces are oil lubricated.

The wedge grips are required to indent the strand to prevent strand to wedge slippage. This interface is best protected against corrosion by oil coating and the exclusion of dirt and concrete.

The wedge to tapered hole interface also requires oiling or greasing such that it *lasts the life time of the structure*. Unless the wedge can freely move into the taper hole, there will be a breakdown in the grip efficiency because the wedge cannot increase its lateral pressure at the wedge/strand interface.

Any introduction of cement, grout, concrete or other setting product into the prestressing head reduces the performance of the head since it may prevent free movement of the wedge.

Furthermore, should oil or grease not be present, then there is also a risk of corrosion of the wedge/taper hole interface. Both these occurrences prevent free movement of the wedges and reduce the prestressing head performance.

Photograph 1 illustrates the effect of such corrosion

- The strand section



Photograph 2. Shows benefits when using grease filled protection caps.

was reduced due to corrosion

- The wedges were prevented from pulling into the head
- The strands pulled through the wedges and monostrand heads fell off the anchor head plate

Photograph 2 provides a fine example of the benefits of the use of grease filled protection caps.

This 16 year old inspected head was located low in the tidal range at Aberdeen Harbour and therefore subjected to aggressive environmental conditions (visible adjacent to the cap). The only part requiring replacement was the corroded steel head cap which was replaced by non-corrodible glass reinforced fibre caps.

Technical reports on such inspection and more detail is provided on [www.theanchorman.com](http://www.theanchorman.com)

We hope the Committee agrees with some of the above conclusions and considers recommending the use of grease filled caps on all permanent anchor projects.