

CASE STUDY

Balfour Beatty/ Zueblin | Hydraulic casing handling device – 27.04.22

Introduction

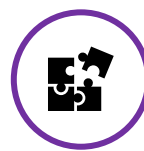
Zueblin, Balfour Beatty's main contractor working on the A63 scheme have introduced a hydraulic casing handling device to the UK piling market which is making the handling of temporary pile casing sections safer, quicker and more sustainable.

This innovative piece of equipment was developed by the Zueblin plant division in Stuttgart, Germany and introduced to the A63 Castle Street Improvement project in Hull in close cooperation with Balfour Beatty. The hydraulic clamping device is mounted to a Liebherr wheel loader type L550-L576 which is generally used as part of tunnelling operations and has now been introduced to a UK piling project following a number of smart modifications to the standard loader configuration.



Overview

The standard loading bucket was replaced with conically shaped, rotating forks attached to the hydraulic quick hitch of the loader. This clamping device is capable of safely grabbing casings and rotating them from horizontal to vertical position and back. The loader operator is capable of picking up casing sections from their designated storage area and feeding them directly onto the temporary pile casing in front of the rig to connect with the casing collar & casing drive adapter. The reverse process is applied when removing casings during pile concreting.



Challenges

Tension piling presented a number of challenges (both safety and sustainability) predominantly centered around lifting and platform stability. This innovation was developed to -

- Eliminate the risks associated with the lifting of casings
- Minimise damage to piling platforms
- Expand the life span of casings
- Reduce the risk of casings toppling over due to inadequate anchorage into platforms





Action Taken

The standard loading bucket was replaced with conically shaped, rotating forks attached to the hydraulic quick hitch of the loader. This innovation has allowed the elimination of common dependence on cranes for the installation of casings completely. This in turn has removed all risks associated with the lifting of casings. Thanks to the handler, all casings on the project are now stored horizontally completely avoiding the risk of casings falling over due to insufficient embedment into the piling platform or unforeseen contact with plant. As a secondary benefit, the life span of casings has also exponentially increased as there is less wear and tear on female casing joints which otherwise would have to endure repeated insertion into the highly abrasive working platform material. When not in use, the casing handler is easily exchanged with a custom-made skip using the loader's quick hitch. The skip is positioned next to the rig so that drilling tools can release pile arising without deteriorating the piling platform. The full skip is transported by the wheel loader and emptied at the muck storage area. This eliminates the need for additional dumpers & excavators in congested working areas. The benefit to the piling platform condition directly minimises the rig of plant instability caused by poor platform conditions and soft spots.

Results

- No slinging of casings - Removing the requirement for working in close proximity to plant (people plant interface) & working at height when the upstanding casings need to be attached to a crane.
- No slinging of casings - Improved productivity by quicker assembly / disassembly of casing strings.
- No vertical casing storage - No risk of casings toppling over due to inadequate anchorage into platform, avoiding damage to piling platform / soft spots which could compromise the stability of heavy plant as casings are not "stored" in piling mat.
- No vertical storage - No wear & tear on casing collars which would otherwise be screwed into the piling platform for temporary storage



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home
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and well

