BOLLARDSCAN

a non-destructive test method suitable for bollards

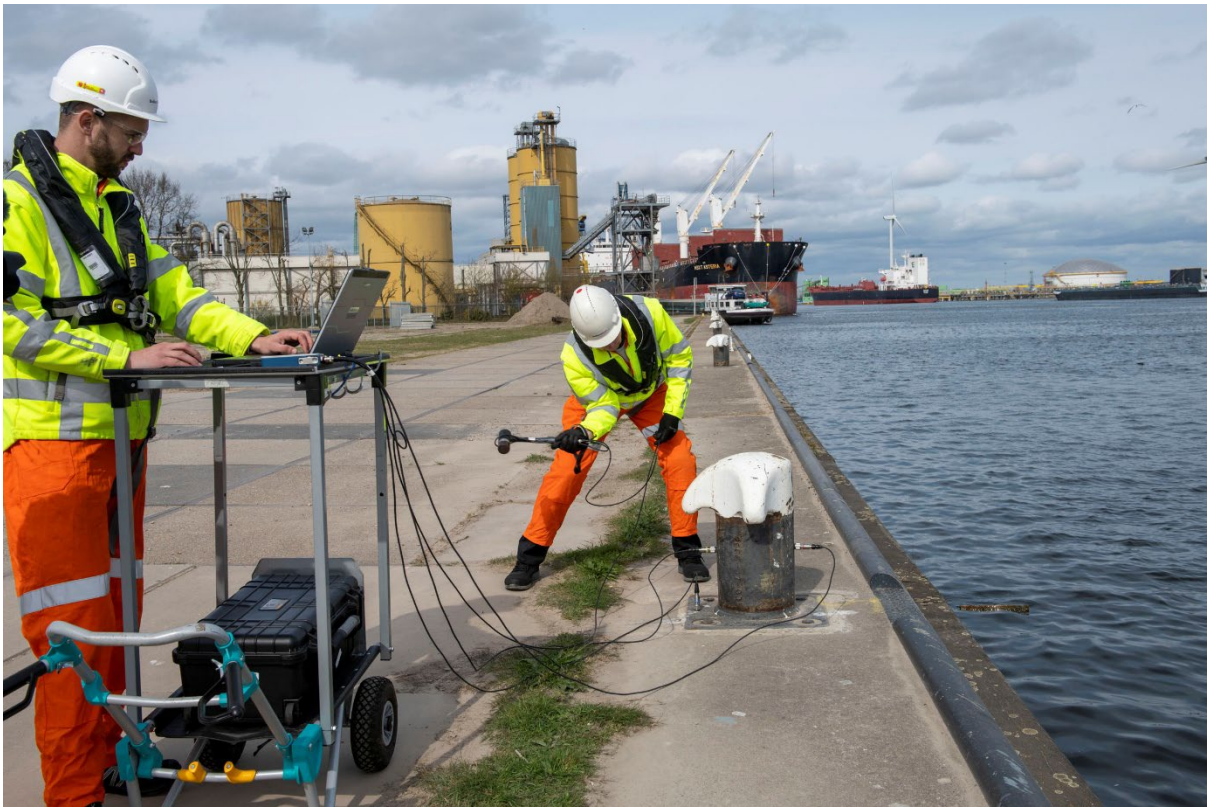
the challenge

The failure of mooring bollards and their anchoring is becoming more commonplace. Both bollards and anchoring can work themselves loose over time and this can not be detected with a simple visual inspection.

Load testing of/bollards can be detrimental to the bollard integrity and actions that risk making bollard integrity worse than it is, should be avoided.

To solve the problem we developed a non-destructive test method suitable for bollards; BollardScan©.

The report delivered to clients is comprehensive and reflects the present state of the bollards and their anchoring making it easy to execute improvements and plan safe operations. It also aims to create awareness of the importance of the correct use of bollards such that all who are involved on the mooring process are aware of the do's and don'ts with bollard operations.



the innovation

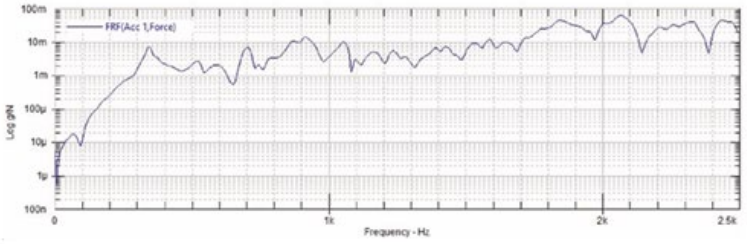
What we measure in the vibration test…

The principal of vibration testing is simple: what goes in must come out.

We excite the bollard and its anchoring. The force used is the equivalent of 10 kilo newtons (kn) for bollards up to a 100 Ton Safe Working Load and 15Kn for greater than 100 Ton Safe Working Load.

A rubber tipped "calibrated" hammer is connected to the recording programme which measures the force used.

The resulting vibration is measured with accelerometers. These are typically used for vibration measurement.



Measurements are taken in three different directions, 0° towards the water, 90° clockwise and 270° clockwise. These three directions will always be within the limits of the mooring line angles and reflect the way the bollard is typically designed and the normal way mooring lines are directed. i.e. out and up.

The positioning of the sensors on the bollard is important. Sensor 1 (the zero degree position) is attached on the seaward side of the bollard, midway on the solid column of the bollard (see image). Sensor number 2 is positioned on the landward side slightly lower than sensor 1. If the bollard is built onto the quayside, sensor 3 is placed horizontally below the 2nd

sensor. If the bollard is sunk into the quayside the sensor is attached vertically on the edge of the baseplate. The exiting of the bollard with the hammer will always be in the direction of the single sensor.

The system has been used to successfully test over 10,000 bollards.

how it was implemented

Implementation was done after independent verification of the system by Vienna Consulting Engineers and Lloyds Register.

We now have agents delivering the service in many countries having built up our client base through demonstrating the service to numerous ports world-wide.

result

We have tested over 10,000 bollards since 2016. The overall failure rate is around 1% with a further 10% typically under active consideration for example with advice on possible corrective maintenance. The remainder typically pass.

conclusion

With the BollardScan method we offer our clients an in depth report on the state of their bollards and where needed we give advice on possible improvements.

It is a fast, accurate and cost effective method and the bollards passing the test will be insured for a period of 3 years.

LINK: https://bollardscan.com/

BollardScan™