

Reducing exposure to vibration

Construction Occupational Health case study COH12

The problem

Compacting soil and other fill occurs on practically all construction sites. All compaction generates vibration, which can then cause hand-arm vibration syndrome (HAVS).

Compaction of fill is necessary to make sure that structures are stable. However, over-compaction can cause problems.

In the case of the Channel Tunnel Rail Link project, huge areas of fill needed to be compacted using a wide variety of compactors. It made economic sense to test the assumptions made in the Specification for Highways Works.

The risks

The longer a vibrating compactor is used, the higher the vibration exposure of the operator, irrespective of the machine size.

The solution

Three specific activities were undertaken:

- Technical testing: The team, comprising Rail Link Engineering, Balfour Beatty and Wacker, did technical tests to establish the number of passes that were actually needed for three machines to achieve the required level of compaction of fill material. The findings showed that significantly fewer passes were needed than a Highways Specification stated – typically, the number of passes halved.
- Workforce training: Site workers were trained how to avoid exposure to hand-arm vibration.
- Communication: Machine pass information was recorded on a job card and attached to the specific machine. The job card also included information such as the weight of the machine, how to lift it, the level of vibration generated by the machine and the maximum trigger time (Figure 2).

The benefits

- Greatly reduced exposure to hand-arm vibration.
- Ongoing health benefits for the site operatives because of reduced vibration exposure.
- Increased productivity for compaction activities.
- More efficient use of machines, with less frequent repair and less downtime.
- Lower fuel consumption and emissions.

- Cost savings: the overall compaction cost halved and the project completed more quickly.

Notes

- All three activities (technical testing, workforce training and communication) were required to achieve the benefits.
- There were cost savings – contractors did not need healthcare to deal with HAVS.



Figure 1 A compaction machine in use

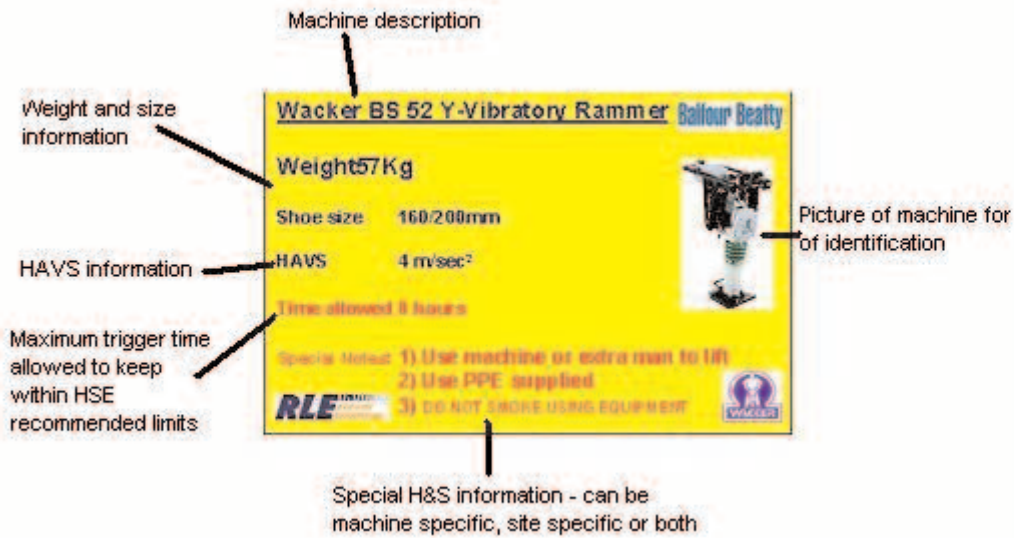


Figure 2 Job card example