**Technical contribution: dynamic ground compaction and how it works**

**Duty cycle cranes are used around the world for all sorts of different applications. Thanks to their high load capacity they can also be used for dynamic ground compaction. This includes the systematic improvement of the ground's bulk density by continually dropping heavy weights.**

The ground needs to be compacted even more in preparation for construction and to prevent cavities forming. Dynamic ground compaction is a tried and tested technical and yet simple procedure. It involves repeatedly dropping a heavy weight from a height of up to 30 m onto the ground. The kinetic energy that is released on impact leads to compaction of the ground and has an effect for a depth of between 3 m and 10 m. The degree of compaction depends on the size of the falling weight, the height it is dropped from and the spacing between the impact points.

In practice this usually means a steel or concrete block, typically square or circle in shape, being dropped from a large crawler crane using its freefall winch, then being hoisted up again and the process repeated.

**Why duty cycle cranes?**

Why are duty cycle cranes suited to this task? The basic construction design and performance of robust SENNEBOGEN crawler cranes means that they are already suited to lifting large dynamic loads. The freefall winch is necessary to ensure that the weight falls unchecked and transfers the full amount of kinetic energy into the ground. Initially the cable is pulled freely through the winch by the weight, and shortly before impact it checks the load in a controlled manner, in order to prevent the cable becoming slack and unwinding completely. Finally, the cable is either automatically or – once activated – reeled back up and the process begins again. The ground compaction and the process are controlled by software so that the crawler crane can operate repeatedly and fully automatically.

The process of dynamic ground compaction is often used in practice to increase the load-bearing capacity of the ground beneath construction sites. It is also used to prevent settling when digging foundations. Finally, the process is also used to improve the compaction of infill and in land reclamation. The SENNEBOGEN heavy duty cycle crawler cranes from 670 HD to 6140 HD are particularly suited to dynamic ground compaction.

**Image caption:**

The SENNEBOGEN duty cycle crawler crane can be put to good use in dynamic ground compaction thanks to its robust, heavy duty equipment and powerful freefall winch. A control program takes care of the automatic process of dropping and lifting.