

Surround view cameras

All-round Visibility Standard

1.0

Objective

In order to maintain an Injury-Free Environment for all our workforce when working with and around plant, Skanska UK is further expanding the use of proximity warning systems¹ for mobile construction plant operating on its sites.

All items of plant with blind spots² and within scope of this standard will be fitted with a surround view camera which meets the technical requirements for all-round visibility³ identified in this document.

The purpose of introducing all-round visibility is to assist plant operators with the safe movement of plant equipment under their control. The responsibility for awareness of pedestrians and obstacles prior to and during reversing or maneuvering remains with the operator.

2.0

Scope

The following list is not exclusive, but indicates the type of mobile construction plant that fall in range of these rules:

- Hydraulic excavators, tracked or wheeled >10t
- Telescopic handlers where a side loading arm causes restriction in operator vision
- Tracked dozers and graders
- Ride on compaction rollers that are fitted with enclosed cabs
- Wheeled loading shovels
- Piling rigs (not mini rigs)
- Crawler cranes

Specific items of plant are **excluded** from the rules, these include; both mini/midi excavators; bob-cats; pavers; backhoes excavators; and trac-airs.

3.0

Mobile construction plant operations

Wherever plant is used onsite, where reasonably practicable the plant shall be segregated from personnel through the management and physical arrangement of the workplace e.g. exclusion zones⁴ and engineering controls such as 2D or 3D machine control/guidance technology which mitigates the need for persons and checkers to work within the area of operations.

Whenever operator visibility for operations is considered to still be ineffective after the introduction of workplace and engineering controls, only then can Plant and Vehicle Marshals (PVM) be introduced to guide and assist plant and vehicles into and from restricted areas, following a risk assessment as part of a formal safe system of work.

All supervisors, operators and PVM involved with plant operations shall be suitably qualified and experienced in accordance with Skanska UK procedures. Competence will include pre-task briefings on the current safe system of work.

Pedestrians walking or working in or around the proximity of plant shall have sufficient understanding of the hazards, risks and control measures that will keep them safe at all times. Refer to the People-Plant Interface: Restricted Zone toolbox talk contained within Skanska UK procedure for plant and equipment.

4.0

Technical requirement for all-round visibility

1. General requirements for mobile construction plant

A surround view camera system that interlinks pictures from multiple cameras that can display a pedestrian from a maximum distance 5m to a minimum of zero in all directions.

- 1.1 Pedestrians and objects such as materials should be visible up to a height of 1m over the entirety of the surround view and must not disappear on the boundary between cameras.
- 1.2 The surround view must cover at least a 270° field of view. The remaining 90° quadrant being within the operator's direct line of sight at all times, with any machine boom not obscuring operator vision.
NB. Where the camera system is an after factory installation then it must cover the full 360° field of view⁵.
- 1.3 The operators screen must present an image of a bird's eye (surround) view interlinking the input from all cameras fitted, see clause 1.2 above.
- 1.4 Cameras must have a wide dynamic range and real time video delivery of 25 frames per second as well as being able to function in normal construction environmental conditions e.g. lighting levels. Alternatively,

2. Specific requirements for piling rigs and crawler cranes

A surround view camera system including pedestrian detection that covers the operator's blind spot(s) is acceptable, the operator will have a full view of the area not covered by the system. The pedestrian detection system will analyse camera feed(s) and will inform the operator of an intrusion of an identifiable pedestrian from a range of at least 7m. In addition to an audible & visual warning, the system will record the event with CCTV footage for review later if necessary.

5.0

6.0

Programme

The original surround view camera / proximity warning system standard was introduced in 2015. This revised standard will take effect from **1 April 2019**. All plant compliant with the original standard remains acceptable for continued use on Skanska UK sites.

Notes

1. Proximity Warning System – is a system designed as an aid to vehicle operators, to assist them in identifying if their vehicle is in imminent danger of contacting a pedestrian or an obstacle within their vehicle exclusion zone⁴. All systems must possess the applicable certification e.g. CE or equivalent marking and be fully supported throughout their life.
2. Blind Spots – are defined as a lack of direct line of sight from the vehicle operator's position. These are caused by for example, the size of the vehicle, its bodywork, or side mounted hydraulic arms.
3. All-Round Visibility – an extension to the vehicle operators range or possibility of vision through artificial means to overcome blind spots² and avoid collision with pedestrians or other obstacles when maneuvering, as opposed to travelling over longer distances.
4. Exclusion Zone – is an area designed to prohibit the entry of pedestrians, established through the risk assessment process for a construction activity. Typically, exclusion zones are setup and maintained around plant and below work at height, also know as 'red' or restricted zones. Refer to the People-Plant Interface: standards contained within Skanska UK procedure for plant and equipment.
5. Machines fitted with cameras covering 360° and conforming with the original standard remain compliant with this revised standard.