

The climbing of tower cranes by unauthorised people, often at night-time when the site is closed, is becoming an increasing problem, particularly on urban sites. This activity, which appears to be treated as sport by those involved, generates risks including:

- Significant risk of falling for the climbers;
- Damage to edge protection on the tower crane and building structure, putting site personnel at risk of falling;
- Damage to the tower crane which is not immediately revealed;
- Damage to the contractor's reputation if people are injured/killed.

The measures that can be taken to discourage/prevent this activity can be divided into two categories:

- General site security measures to discourage/prevent access to the tower crane;
- Tower crane specific measures to discourage/prevent climbing of the crane.

The primary responsibility for the security of a site and the provision of tower crane specific measures rests with the occupier of the site, generally the Principal Contractor. Tower crane suppliers are able to assist with provision of tower crane specific measures and should be consulted before the crane is installed as any measures may well have an impact on the crane's foundation and tie loads, due to increased wind area.

When considering tower crane specific measures, the need to provide safe access for essential maintenance and erection/dismantling personnel should be taken into account.

Arrangements for additional security should be considered during erection/dismantle where permanent measures may not be fully in place.

NOTE: Sites are sometimes approached to allow access to the tower crane for entertainment purposes and filming. This should be discouraged as it may encourage unauthorised access.

1. Outline of General Site Security Measures

- Site security arrangements established to restrict and control access to the site outside normal working hours, e.g. security personnel, CCTV, signage and controlled lighting. These arrangements should be checked regularly for effectiveness;
- Consideration of 24-hour manned security;
- CCTV on site to include coverage of tower cranes. Some systems can be operated and monitored remotely from a central control room and may incorporate loud-speakers to allow the control room to speak to intruders;
- Temporary works approved 3-metre high hoardings and lockable access gates, both of close boarded construction which cannot be easily climbed;
- Access gates which prevent access below the bottom of the gates;
- Where the hoarding is located adjacent to street furniture or permanent or temporary structures etc., the hoarding must be 3 metres above the top of the furniture/structure;
- Lockable access points from upper floors where the tower crane mast is accessed by crane operators;
- Where masts are close to a building, anti-climb measures added to prevent climbing from the slab edge onto the crane mast;
- Intruder alarm systems similar to those fitted to scaffolding;

- Measures for dealing with trespassers and reporting to the appropriate authorities, including emergency situations.

2. Tower Crane Specific Measures

Where the Principal Contractor's risk assessment shows that there is possibility of unauthorised access up the crane tower/structure, the organisation hiring in the crane should ensure suitable prevention controls are implemented. This risk assessment should be reviewed as the building progresses or the crane is tied in or climbed.

The Principal Contractor should consult with the tower crane supplier who will be able to seek the manufacturer's approval for, and arrange, any fixings to the crane structure.

In the past sites have tended to erect two-metre high wooden hoardings around the base of the tower. This solution, used by itself, has two main disadvantages:

- The barrier can be easily climbed with a short ladder;
- The hoarding masks the crane structure at the base of the tower, making it difficult to inspect and examine (see **Figure 1**).

An improved version of the base enclosure is shown in **Figure 2**.

Base enclosures should have sufficient space for personnel to walk around the crane mast and door locking arrangements designed to avoid people being locked in the enclosure. Those enclosures made from hoardings should be treated as temporary works and designed and checked accordingly.

A more effective solution is the provision of a horizontal barrier and trapdoor in the interior of the tower with an external anti-climbing fan at the same level (see **Figure 3**). If this solution is adopted it is vital to ensure that the locking arrangements on the trapdoor are such that in event of an emergency, it can be opened from above without the use of a key.

Arrangements should also be made to ensure that any key required to open the trapdoor from below is readily available to an authorised person in the event of an emergency, such as the operator being injured or requiring medical assistance. This can be overcome by the use of a keyless combination lock (see **Figure 4**).

An alternative is the use of anti-climb panels fitted to the outside of the crane tower around a rest platform (see **Figures 5, 6 & 12**). The rest platform is then fitted with a lockable trap door. It may be necessary to fit panels at more than one location to provide adequate protection against unauthorised access.

It is recommended that gaps around trap doors are restricted to a maximum of 100mm to prevent persons squeezing through the gap.

Weld Mesh panels should have a mesh size that will not allow the gaps in the mesh to be used for handholds e.g. not more than 75mm x 12.5mm.

Both of these solutions can be used with a base enclosure (see **Figure 11**).

All devices and measures fitted to tower cranes must be designed and design checked correctly. See TIN043 *Design and Design Checking of Attachment Brackets for Tower Crane Accessories*.



Figure 1 – Base Enclosure



Figure 2 – Improved Base Enclosure



Figure 3 – Anti Climbing Fan



Figure 4 - Trapdoor and Base Enclosure Lock



Figure 5 - Anti-climb Panels



Figure 6 - Anti-climb Panels and Trapdoor



Figure 7 Anti-climb Panel with Cable Duct

Prevention of Access via the Power Cable

Unauthorised access to the top of tower cranes is sometimes achieved by trespassers climbing the crane's power cable hanging down the outside of the tower. This can be prevented by manufacturing the anti-climb panels with a duct to accommodate the power cable between the panel and the face of the tower (see **Figure 7**). Care should be taken to ensure that the duct is sufficiently large to prevent chafing of the cable and allow climbing of the crane



Figure 8 – Trapdoor

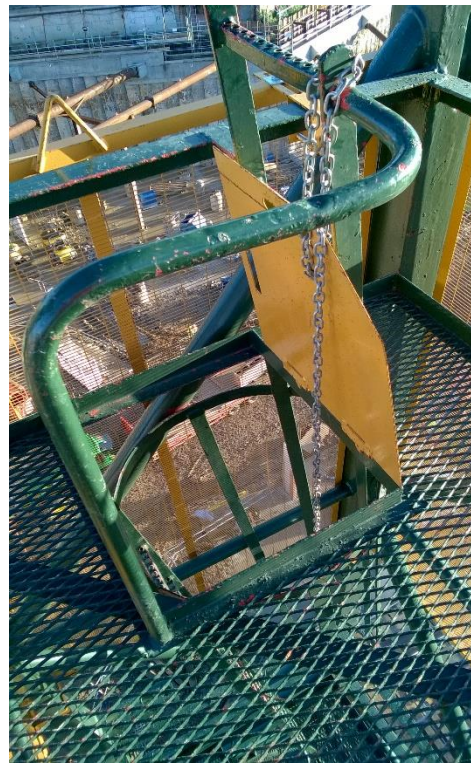


Figure 9 – Trapdoor



Figure 10 – Toe board Infill



Figure 10 – Toe board Infill

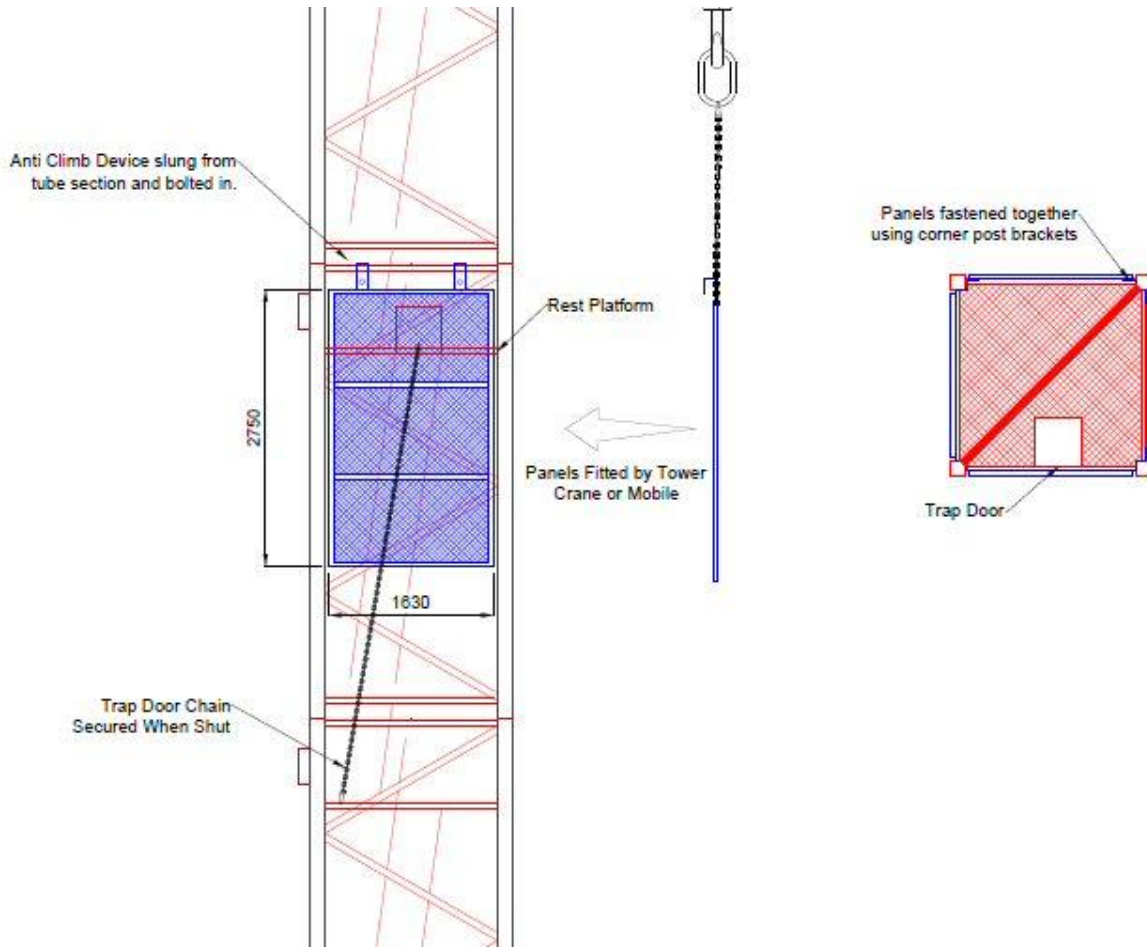


Figure 12 – Example of Anti-climb Panels