



Best practice guidance for construction companies

Construction sites are an easy target for thieves. The lure of quick and easy profits attracts them to high-value plant and equipment. Arson and malicious damage are equally unpleasant and unwelcome site security problems.

Foreword

Drawing on the expertise of our in-house Risk Engineering team and working in partnership with solicitors DAC Beachcroft LLP, we have produced the following best-practice guidance to help you maximise your site security and to minimise the threat of theft, deliberate damage and arson.

There is no easy solution to these problems, but this document draws upon our knowledge and experience to suggest improvements. The following pages should help owners and operators of construction sites to protect against theft, arson and malicious damage.

The benefits also extend to helping deliver projects on time by minimising the risk of a major fire or theft which could otherwise lead to lengthy delays, penalties, adverse publicity and loss of customer confidence.

Inside there are specific measures for the prevention of plant theft, materials theft and arson, as well as best-practice security measures for the whole site.

Potential Liabilities and consequences

Every year construction site workers, children and other members of the public are killed or injured because construction activities have not been adequately controlled. Property adjacent to construction sites can also be damaged and occupants put at risk, for example, if there is a site fire and it is large enough to spread off-site.

The HSE reports that the construction industry's performance has improved over the past decade, but the rates of death, serious injury and ill health are still too high.

The cost of dealing with a civil claim or criminal prosecution can be significant in terms of investigation, lost time, indemnity spend and potentially criminal fines. This is in addition to the reputation cost associated with such incidents and any subsequent litigation.

Counting the cost

Theft and arson are two significant reasons why insurance costs are increasing. The Home Office estimates that construction loses £400m to theft each year, while 104,000 deliberate fires see England and Wales alone suffer 53 injuries and 2 deaths every week.

Uninsured expenses, liquidated damages, business interruption, lost man hours and uncertainty often add insult to injury.

Occupiers Liability Act 1984 – Trespassers

It is important for an occupier of a site to understand that they do have a duty of care to people who trespass on their premises. Although that can seem unjust in some circumstances an occupier cannot ignore it.

This is especially true where there is a hazard that might be attractive to trespassers and in particular, attractive to children. In assessing whether any liability should attach to an occupier, the Court will consider:

- a) Was the danger known to the Occupier?
- b) Does the Occupier have reasonable grounds to believe there are trespassers?
- c) Was the risk one against which the trespasser should be afforded protection i.e. should the occupier protect the trespasser from his own stupidity?

These factors need to be borne in mind at all times when assessing site security.

Plant theft/security

Construction plant security is particularly challenging area as professional thieves are well versed in both stealing and disposing of plant. This has led to low recovery rates in the past but this situation has improved as a result of the construction industry taking advantage of security schemes and equipment.

Over £1million worth of plant and equipment is stolen each week in the UK alone and less than 10% is ever recovered. In many cases it is ready to be taken outside the country in a shipping container within 24 hours.

Despite the availability of protection systems, it is common to find £60,000 excavators, without any form of reliable security, left vulnerable to theft overnight on open contract sites.

A key step in any plant security strategy is to ensure that supervisors and operatives understand best practice methods which can reduce the risk of theft. Potentially this is a very effective and inexpensive method of enhancing plant security.

To ensure effective implementation it may be necessary to link plant security to company incentives or incorporate within general work objectives. The goal is to achieve employee buy-in regarding plant security so that it is no longer seen as a chore at the start or end of the working day.

To back up company policy training time should be allocated so that key messages can be reinforced and best practices shared.

Plant Security – Staff Awareness Training

A staff awareness training session on plant security could include the following points:

1. Positioning of equipment such as extending hydraulic arms especially if this can be used to block in other smaller equipment
2. The need to engage physical security devices such as breaker locks, leg locks, ram locks, track locks and wheel clamps
3. Erecting temporary secure compounds
4. Understanding which plant is most at risk e.g. excavators, telescopic handlers, generators, breakers etc. so that extra precautions are put in place for these items when siting equipment at the end of the working day
5. Emphasising good key security and activating any immobilisation or tracking systems

Plant Security – Company Policies & Strategy

Plant security can essentially be divided into two overlapping areas. Firstly there are those devices and strategies which are designed to prevent the theft occurring in the first place. Secondly, the security devices which are aimed at improving the chance of recovery should the item be stolen.

When implementing a plant security strategy there are a number of important factors to assess. For example, the replacement cost of the item of plant needs to include reference to the ease and time taken to replace the item. When machinery and plant is stolen that cannot be quickly replaced there may be significant hire charges incurred in order to prevent delays to the construction project schedule.

Consideration should also be given to security at weekends or during holidays when sites are most vulnerable.

Is your plant identifiable?

Identifiable in respect of construction plant refers to proof of ownership and whether the police can determine this with certainty. The result of poorly marked equipment is that the police may be powerless to confiscate items of stolen plant.

The following are considered to be effective methods of identifying your plant:

- Use of the CESAR (or CESAR Compact Scheme for smaller items of plant) is strongly encouraged
- The use of vehicle identification numbers
- Use of 'data dots' or Smart Water containing unique identification marks
- The use of corporate colours
- Accurate records of company plant and a photographic database (this is especially useful if unique identifiable features are included)

The CESAR Scheme provides construction plant with a package of security measures, including unique registration, hidden electronic data device and security dots identifying every key element of the plant. The CESAR Scheme has a proven track record of both improving the rate of recovery and acting as a deterrent.



NOTE: Zurich are able to apply a 25% premium discount on any plant that is CESAR registered.

Physical and Electronic Security Devices

When considering construction plant security measures it is advised that this is also extended to any plant which is hired in. This may not always be possible at short notice but only dealing with those hire companies which can supply equipment with the appropriate standard of security will be of long term benefit.

Buying new plant with the appropriate security already fitted is an important step but the protection of older plant, which may be especially vulnerable due to its inherent poor security, should also be addressed.

Areas to consider are:

- Physical locking devices such as leg locks, ram locks, track locks
- Applying tow hitch locks to trailers
- Immobilisation devices especially those which are Thatcham approved
- Key security both for day time and when the site is unoccupied
- For high risk plant the use of tracking devices

Tracking devices alert a monitoring station to any unlawful movement. Such devices can, if installed and specified correctly, be extremely effective at detecting and tracking a theft of a specific item of plant in order that the police can be informed of the stolen plants exact location.

It is possible to overcome some tracking devices. For this reason, high theft risk plant should only be fitted with Thatcham approved tracking devices which have been installed by approved companies with signalling systems to include radio based (RFID) transmission. The radio transmission can also include mobile phoned based technology signalling (GSM/GPS) as a back-up.

It is considered essential that there is an immediate activation of any tracking system following any unauthorised movement of the construction plant. Tracking devices which need to be activated by an employee upon discovery of the theft are not advised due to the speed at which thieves can dispose of construction plant.

For more information and advice on the prevention of plant theft, registration of plant, used equipment checks and much more we would recommend the Thatcham website <http://www.thatcham.org>

General Site Security & Fire Safety

It is recognised that the construction industry have improved their record regarding fire safety and security on construction sites.

In Zurich's experience what makes the difference between good fire safety planning on paper and effective fire safety in practice is those on the ground. In particular, site managers have a very important role to play. For example, it is during the site manager's regular walk round of the site which indicates those site working practices which are accepted either directly or implicitly.

Site managers are therefore encouraged to regularly and publicly reinforce high fire safety standards. In the frequent event that build schedules become pressurised fire safety standards are much less likely to slip if clear ground rules have already been set.

Another effective lever is for senior management to promote fire safety and security standards amongst site managers, construction workers and subcontractors by recognising and potentially rewarding high performing individuals or organisations.

Investing in Fire Safety and Construction Site Security

How much resource should be invested into fire and security at construction sites is a difficult question and can be seen as burdensome to the overall build. It is therefore advised that each key stage of the build is assessed to ensure that the most appropriate and cost effective measures are implemented.

Key stages will vary but can include demolition, foundations, framework, main structure, fit-out and completion. When assessing fire and security measures the following questions can be posed:

1. When will combustible materials be introduced to the build and how long will they remain exposed for?
2. When will theft attractive fixtures and fittings be installed such as copper electrical wiring and copper plumbing?
3. Where will other combustible and flammable materials be located and stored and in what quantity?

Each of the answers should be assessed in terms of their financial consequences should a major fire or theft take place. For example, at the stage of framework, a concrete or steel frame will be much less exposed to the risk of arson compared to a combustible frame. For the former scenario good quality hoarding may be considered appropriate whereas the latter may require manned overnight guarding.

Considerations in terms of :

1. Materials theft/security

Insurers see a particularly large number of claims relating to the theft of materials from construction sites.

1.1 Logistics

The amount of stock left on sites should be kept to an absolute minimum. Unattended materials present an opportunity for thieves, vandals and arsonists. Best-practice stock logistics can help. Just-in-time delivery scheduling could be employed, delivery times could alternate and there should always be someone trustworthy to accept the delivery. If materials have to be ordered in bulk, these should be stored in a security compound or an area where theft will be noticed quickly.

1.2 Outbuildings

Often these buildings contain items that can be helpful for would-be thieves, arsonists and vandals. Ladders, for example, can be used to gain access to roofs; petrol in plant can be used to start and spread fire; and portable tools can be used to break into other areas.

Outbuildings are usually inherently weak due to their construction e.g. timber walls. Any temporary outbuilding within the site needs to be securely locked.



Ladders should be secured using good-quality chains and padlocks to prevent illicit use. If the building is not strong enough, then valuable items, or those that could prove helpful to a thief or arsonist, should be stored elsewhere. Security containers should be used to store high-value materials, plant and tools if they cannot be removed from the site overnight.

1.3 Site office

Try to position the site office in an area that minimises access for the opportunist thief. External doors and windows should be in a good state of repair, while good quality locks should be fitted and checked regularly to ensure they function correctly. Vulnerable windows and doors should be fitted with bars and shutters. Use indelible marking techniques on office equipment — stamping, etching, engraving, sandblast, acid pens, SmartWater™ or ultraviolet lacquer.

1.4 Metal theft

Opportunist thieves are now stripping materials, especially metals, from existing structures. In such situations, consequential loss can occur, for example, following the theft of lead roof flashings, when water ingress causes substantial further damage.

Barbed wire secured along the edge of roofs can help prevent access to areas where metals are present within the fabric of buildings. Physical security measures need to be visible, accompanied by appropriate warning signs and deployed at least 2.5m above the ground to give the greatest chance of avoiding any legal liability.

Anti-climb spikes or anti-climb paint can be fitted to down pipes to inhibit access. Consider such measures where metals are present, especially the ferrous metals copper, lead, tin and related alloys like brass and bronze. Care should even be taken to protect areas where non-ferrous aluminium, stainless- and mild steel are present.

1.5 Cable theft

Thieves have been known to cut through live electricity cables and gas mains to get at metals which they can sell on. MEMs Power Generation service is making use of the indelible marking technology SmartWater™, and using it in conjunction with their bespoke remote telemetry and tracking system. This can provide an extremely effective recovery and prosecution tool, but again, to get any deterrent effect, it's important that warning notices are displayed.

2. Non-plant (general site) security

A site operator's reluctance to improve general site security is usually because of cost, especially with many contractors operating at very low margins. However, uninsured costs following an incident are often greater than the cost of improving site security in the first place, so neglecting to do so proves to be a false economy.

2.1 Security patrols

Consider the use of security patrols or manned guarding undertaken by approved security personnel licensed under the Private Security Act 2001. The SIA and NSI are prominent among several official guarding schemes providing details of approved local security companies.

However, you must remember to assess the risks to security staff when considering the adequacy of other security measures and in particular assess the risks from lone working and implement suitable measures to control those risks.

2.2 Perimeter protection

Boundaries need to be strong enough and high enough (2.4m) to keep intruders out. Security fencing is the best form of perimeter protection, although opaque fencing should be avoided as, once scaled, this may provide a screen to hide criminal activity.

Where security precautions are in place, notices should be displayed around the perimeter warning this is the case. These should provide enough information to act as a deterrent without providing details which could be used to vandalise the security measures. Note that if CCTV is installed, notices must be displayed or the imagery cannot be used as evidence.

Ideally, access should be controlled for **all** sites. Visitors should sign in with any 'reception area' ideally situated near the main gate – the fewer known access points, the lower the risk of illicit entry.

Ensure that stored materials are not stacked against walls or fences. This prevents their use as a climbing aid for access, and from being set alight from outside the boundary. Ideally materials should be stored in a secure container.

2.3 External lighting

Providing external lighting on the site can also deter potential intruders, especially where the site is overlooked by other nearby property. This is particularly important in vulnerable areas.

Lighting needs to be installed as high up as possible. Where lighting itself is obviously vulnerable to attack it needs to be adequately protected against physical damage. Armoured cable should be used if malicious damage is a risk. Simple time switches can be used or, alternatively use lighting fitted with motion sensors to reveal intruders.

2.4 CCTV

At the outset, it's important to consider what the CCTV system is there to achieve. It can offer a deterrent against malicious damage, arson, or theft attacks. It can also help provide prosecution evidence for the police.

These intentions will determine the type of system and equipment required. For example, cameras can be concealed or highly visible. The more visible the camera is; the higher its deterrent value. The less visible the camera is; the more likely it is to escape vandalism and survive with its testimony intact.

Examples of the types of system available are listed below:

- Pre-event analysis – Systems that allow personnel to observe live movements as visitors arrive and leave the site during the day.
- Active CCTV/PA systems which allow staff at a control centre to speak to intruders and inform them that police have been called are also a useful deterrent.
- In recent years mobile CCTV towers have also become available providing ease of installation and relocation. The units make maximum use of wireless communications technology, minimising disruptive cable runs and ideal for temporary requirements due to the elimination of ground works requirements.
- Post-event analysis – involves the recording of images. It enables viewing of the events that took place while the site was left unattended.

2.5 Remote alarms

Remote monitored alarm systems can be set up to be triggered by the breaking of an infra-red beam, with monitoring station-, key holder- or direct response from the police. Cheaper than static guards, they offer good site coverage and out-of-hours protection. Whole systems can be hired in and these can even include speakers so that intruders can be challenged.

2.6 Secure areas

Secure areas should be created, ideally off site or in areas on-site that have enhanced physical protection. Access to secure areas should be inhibited using physical barriers such as concrete blocks and telescopic collapsible barriers.



Flammable liquids and gas containers should be stored inside secure areas. They are a target because they can be stolen, used as an accelerant to start fires or even to break locks to commit further theft or vandalism.

2.7 Locks

Wherever possible, locks should comply with current British standards. However, even the best locks do not stand a chance against some items of plant e.g. butane torches and heavy plant. Anticipate such plant being used against locks. Mitigate the risk by removing from the site keys for secure areas and plant that could be used to break into these secure areas.

2.8 Security manager

It is important that one person is made responsible for security. They can delegate responsibility for certain aspects to others, but they need to retain overall control and accountability.

Assuming a proportion of site crime is committed by people with links to the industry, the site supervisor has a large responsibility for minimising the risk of theft. They can make a big difference towards reducing the problem if they:

- make informed hiring decisions
- exercise care with whom they entrust possession of keys and key information
- arrange best-practice staff logistics, for example: review and regularly change arrangements like delivery times, and run staff incentives and penalties for good and poor security practices
- promote an all-round culture of security alertness and consciousness throughout site management

2.9 Scaffolding

Scaffolding provides a potential access point onto the roof of a building. Special care needs to be taken and the following additional security measures put in place:

- Corrugated iron sheeting should be bolted to the base of the scaffold, to a height of 3.5m, to deter climbers
- Remove ladders to a secure place at the end of each day
- Ask local people to keep an eye on the property
- Alternatively, the scaffolding can be protected by an intruder alarm with automatic alarm signalling to an alarm receiving centre

2.10 Staff awareness

Good control of staff and vehicles on site is essential and it is important that security measures are discussed at the top level and that all senior staff fully understand the implications of poor security.

- Make individual members of staff personally responsible for equipment they use. If equipment is lost through negligence or carelessness, disciplinary action could be considered

- Security staff should regularly check and search all employees, their lockers and contractors' vehicles
- Employees' private vehicles should be kept off the site
- Make sure that everyone on site knows the company policy on crime management and is familiar with site security procedures
- Everyone should be told they are expected to report suspicious incidents and that everything they say will be treated in the strictest confidence
- Consider carefully and remember who has access to keys for storage of plant

3. Arson and malicious damage

When planning site security, it's important to bear in mind that, unlike an accidental fire, it is the arsonist's deliberate intention to set fire to buildings or items of plant, and to cause damage.

They will be looking at ways to maximise the damage. This may include the use of an accelerant, such as petrol, or starting fires in more than one place. That's why reviewing and changing security arrangements, as the site circumstances change, is very important.

Undertake a fire risk assessment for the site. As part of this risk assessment, plans should take into account:

- The way in which an arsonist could start a fire
- What the effect would be
- How to reduce or prevent the risk.

Check to see if vandalism is a problem in the site's locality. Note that the majority of arson attacks take place between 7pm and 7am. Locate any vulnerable areas around the site e.g. areas out of sight.

Identify and eradicate any obvious fire hazards if they are present e.g. waste material inflammable liquids etc. Prevent rubbish from building up, indoors and outdoors. The Fire Code of Practice provides more info.

Wheelie bins are often set alight. Lock lids to any external wheelie bins. Where possible, store wheelie bins away from buildings, ideally in their own locked compartment, or with a chain secured with a padlock to a post in the ground.

Any external general litter-type bins should be emptied several times each day. Check the strength of locks, window-bars, doors and windows to ensure they are materially strong enough.

Check that intruder alarms cover all areas and that they are regularly maintained. Chain and padlock small items together (or to a secure structure). Store plant and machinery within view of guards or CCTV.

4. Mitigation

Stolen plant should be reported to the police immediately, giving them as much information as possible about the missing item, including all serial numbers or CESAR numbers.

After any theft, or during refurbishment works, replace metal roofing/flashing with materials unattractive to thieves e.g. coated steel sheet, glass reinforced plastic (GRP), non-lead flashing or flexible (bitumised) felt. Speak to your insurer before replacing metal roofing with felt.

Forensic marking compounds e.g. Smartwater, or Select DNA or Redweb's forensic gels and greases are strongly recommended. Such products are easily applied and bond to metal surfaces. They are hard to see in normal light but clearly visible under ultraviolet light and hard to remove. Some metal merchants work cooperatively with the police force by using UV lights on all metal they handle.

Zurich is a major insurer in the construction market with our customers enjoying access to experts in underwriting, claims and risk management.

For further details of Zurich products and policies please contact your insurance broker or your Zurich representative

Useful Links

Plant Security

<http://www.cesarscheme.org/>

<http://www.datatag.co.uk/>

<http://www.thatcham.org/>

<http://www.ter-europe.org>

<http://www.theftsolutions.org/index.html>

<http://www.coneq.org.uk/techint.htm>

<http://www.cpa.uk.net/p/Home-Page/>

Construction Site Security and Fire Safety

Fire Prevention on Construction Sites (8th edition):

https://www.thefpa.co.uk/fpa_home/

Fire Safety in Construction (HSG 168):

<http://www.hse.gov.uk/pubns/books/hsg168.htm>

Construction Design & Management (CDM) Regulations

overview: <http://www.hse.gov.uk/construction/cdm.htm>

For construction site security products and installation selecting companies that have appropriate accreditation and experience is very important.

<http://www.ssaib.org/>

<http://www.sia.homeoffice.gov.uk/Pages/home.aspx>

<http://www.nsi.org.uk/>

<http://www.bsia.co.uk/>

For further information

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