



AUTOMATIC GATES



GUIDANCE FOR **ARCHITECTS**

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SPECIFYING AN AUTOMATIC GATE?

If you are involved in a project that includes the installation of an automated gate the first point to state is the need to be aware that you are actually specifying a machine. Under the EU Machinery Directive 2006/42/EC all new machinery has to be designed and constructed to meet the common minimum European requirements for safety.

The Machinery Directive 2006/42/EC (formerly 98/37/EC) provides the harmonisation of the essential health and safety requirements for machinery, through a combination of mandatory health and safety requirements and voluntary harmonised standards. Such directives apply only to products that are intended to be placed on or put into service in the market for the first time.

As the architect, under the new CDM Regulations 2015, an architect is likely to be defined as the 'Principal Designer' and is therefore tasked with taking into account any significant risks arising from the automated gate design that could adversely affect the project. In addition the designer must understand and mitigate against any significant risks that construction workers may be exposed to and ensure that the client is aware of their own responsibilities

in relation to the automated gate installation. If the designer is aware of gaps in their technical knowledge or experience, the new CDM guidance recommends that they should seek out other professionals to help them, ie a Gate Safe Aware installer (see later).

The designer of an automated gate installation is charged with the responsibility of eliminating / avoiding or reducing / minimizing health and safety risks (so far as reasonably practical) by adopting the correct design, in terms of the actual operation of the gate and its ongoing maintenance.

For example, simple factors such as designing out reducing gaps at hinges could reduce the need for expensive safety equipment to mitigate the risk.

Design guidance

When putting together a design blue print for a site that incorporates an automatic gate installation, you need to address the following considerations:

Physical factors on site

• **Look at the roadway servicing the entrance / exit:**

- Does it slope across the gateway? cambers should be kept to a minimum. Swing gates will require a post between the kerbs. Sliding gates will require a break in the kerb

- Where is the control equipment going to be positioned? If the gate is two way you may need to incorporate an island to allow access to the control equipment from both sides
- Do you need to consider static bollards to protect the gate safety equipment?
- Do you need traffic calming devices? This is especially relevant where a free exit is provided
- Minimise the width of the gateway – the wider the gate the greater the wind resistance factor – and the bigger the gate the more expensive it will be

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Aesthetics

- **Think about the style of gate required - swing, sliding, bi-folding gates, telescopic gates, automatic barrier**

- Swing gates are typically the most cost effective option but be aware of wind force issues which can either stop the gate from working or may even force it shut. Typically a swing gate will be used for narrow entrances up to 8m in width
- Sliding gates will not be affected by wind loading issues and if installed correctly are very reliable, especially if they are a cantilevered system without a track. Sliding gates also represent the ideal solution for a sloping entrance into the site. Be aware that sliding gates require a flat width roadway and space for a run back. Attention should be paid to the support rollers and these must be made in such a way as to reduce a drawing in hazard. Both the support rollers and the motor drive should feature some kind of physical protection around the support posts and physical end stops to prevent uncontrolled overtravel. Typically used for commercial applications

- Bi-folding gates have the same issues as swing gates but operate with more speed and are especially suitable for secure parking areas
- Telescopic gates are similar to sliding gates but typically need 50-60% of the run back required of a sliding gate. These are specialist (expensive) gates and professional advice should always be sought to ensure a safe installation
- Barriers are primarily for traffic control on site and are generally unaffected by road levels. Distinct pedestrian segregation is essential

- **Solid or open infill?**

- Normally the infill of the gate will be the same as that featured on the fence but if it is solid or a fine mesh, this will influence the structure of the gate and its supports since the more solid the gate, the more difficulty there will be for it to operate reliably in strong wind conditions. Solid gates must therefore always be installed with the relevant safety features since the powerful motor required to operate the gates is also capable of moving the gates to cause serious injury or worse



Type of Entry / exit	Control over security	Safety required
Ground loop	1	Maximum
Push button	1	Maximum
Radio remote control	2	Maximum
Digital keypad	2	Maximum
Coded card reader	3	Maximum
Biometric card reader	4	Maximum
Automatic Number Plate Recognition	3	Maximum
Automatic Number Plate Recognition with secondary security check (e.g biometric)	4	Maximum
Guard house with hold to run control	4	Minimum
Time clock	1	Maximum

KEY: 1 = None, 2 = Minimal, 3 = Fair, 4 = Good, 5 = Excellent

Desired method of entry / exit

- Consideration needs to be given as to how access is achieved using the automated gate – whether for pedestrians or vehicles. Segregated pedestrian access should always be incorporated into the specification. It is best not to have both pedestrians and vehicles using the same gate
- Is the priority to keep the site secure? If so vehicles and pedestrians should only be allowed in or out one at a time. For a high security application this will involve airlocks for vehicles and turnstiles for pedestrians
- Where security is less of an issue free entry and exit is an option
- Specific entry / exit control options, see table above:

Performance criteria

- The specification must take into account the anticipated usage of the gate eg a building with a car park with a capacity for 500 cars may require an automated gate to operate as much as 1000 times per day. The operator and quality of hinges required to support this type of usage would differ dramatically from that suited to a gate that is only required to perform 100 operations per day. Allow for potential changes in the number of operations the gate may need to undertake to future proof the installation

- Consider the implications of a power shortage. Is it essential for the site to continue to operate? If so a stand-by power solution needs to be identified. If, in the event of a power cut the gates are required to be put into manual mode identify who will be responsible for this?
- Specify a neat key safe, which contains the keys for every gate. The safe should be installed on the post or adjacent to the post and gate users should be notified of the safe code ensuring instant access to the release key in the event of a power cut. Make sure that the gate owner / user are fully trained to place the gate into manual operation mode

Specialist site requirements

- Does the site represent a high security installation that demands that the need for security overrides the requirement for gate safety?
- Does the site need to be DDA (Disability Discrimination Act) compliant? Consideration will need to be given to gates in addition to turnstiles for disabled pedestrians
- Will some / all of the gates need to be kept fully open in the event of a fire alarm being activated?
- Do the gates need to be kept open at critical times of the day to allow for high levels of pedestrian / vehicular access? Similarly, does vehicular access need to be denied at certain times of the day?

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All of these questions and more will need to be considered ...

Safety considerations

A safe gate is a gate that has been installed using the various harmonised standards to guide the installer through a multiple risk assessment to ensure its safe operation.

If a gateway has not had multiple risk assessments and is only 99% safe, there is still a 1 in 100 chance of injury – as the architect can you afford to take this risk?

Please note that level of safety is site specific so the following is just a general overview of all the safety an automated gate could have. In order to comply with the guidance provided in the standards a gate must feature at least two forms of safety:

- Photocells or light curtain
- Safety edges
- Force limitation
- Reducing gap protection

Gate Safe advocates that photocells are installed on every gate / barrier. Photocells or light curtains should be correctly positioned to suit the site, for cars 500-600 mm from the ground level and for HGV / Lorries 100-1200 mm from the ground. If cars and lorries will be using the entrance two sets of photocells should be fitted or angled beams used.

Safety edges should always be installed in the correct areas on swing and sliding gates. On sliding gates, edges should be fitted to the portal, slam portal and the trailing / leading edge of the gate. On a swing gate, edges should be fitted to the leading edge of the gate and on either side at the bottom of the gate.

However while force testing does have its place, it does not take into account the physical factors that effect the gate's operation in the field (eg wind loading) and for this reason, Gate Safe does not recommend force limitation as a primary form of safety.

In addition to the above safety features, a safe gate specification should include the following guidance / consideration:

- the siting of any control equipment (push button or key switch) should be such that a person cannot put their arm through the gate to start the operation. Control equipment should always be (on both sides of the gate) a minimum of 1500 mm away from the gate or shrouded to prevent activation from the wrong side of the gate

- if the gate is not solid (whether swing or sliding) steps should be taken to prevent entrapment of limbs, if a gate is smaller than 1.8m high the portals / support posts should be fully meshed to prevent anyone falling in from above the gate. Similarly there is a need to safeguard against the risk of someone slipping and falling whilst the gate is in operation
- vertical pales on any automated gate should feature a maximum gap of 100 mm between the pales to minimise the risk of whole / part body entrapment
- swing gate hinges must be fitted so that there are no reducing gaps as the gate opens and closes. If there are closing gaps, these should be protected by shrouds or electronically (ie using pressure edges). The failure of a swing gate hinge must not create a situation which could potentially lead to the gate falling ie the failure of one component should not jeopardise the safety of the entire gate. Inverted hinges should not be used
- gate posts must be sufficiently strong and correctly bedded into the ground to support the overall gate structure. The foundations into which the gate is installed must be adequate and consistent with the specific ground conditions for the site. For example a sandy type soil will require a deeper foundation than a stony soil
- pedestrians should be given a separate access point via a pedestrian entrance gate. Where the pedestrian gate is located next to the vehicle gate, there should be fencing or a guard rail to ensure that pedestrians are kept away from the main gate during its operations
- automated gates should feature a lockable IP rated control cabinet, visual and / or audible warnings and signage
- the electrical connection must be tested by an electrician qualified to 18th edition of BS EN 7671 with at least 3 years experience and fitted in accordance with Part P of Building Regulations 2000 for domestic installations
- objects which might obscure the photocells' ability to detect movement will also influence the safety of the gate. Snow, a build of leaves or general debris can therefore represent a further potential safety hazard by sending a false message to the gate controller and not allowing the gate to move

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Compliance

- All automated gates are legally required to be CE marked to demonstrate that they comply with the EU Machinery Directive
- In addition all gates must be supplied with a Declaration of Conformity, issued by the Responsible Person (normally the manufacturer) declaring the product's conformity
- A gate that is CE marked is not necessarily safe. A gate that isn't CE marked is not necessarily unsafe
- The specifier must reference the need for full training for all relevant gate users
- Gates should be supplied with a warranty of a minimum of 12 – ideally 24 months covering parts and labour
- A site specific maintenance regime should be incorporated into the warranty
- Specifiers must provide written documentation that all maintenance and on-going risk assessments should be



recorded and this should be included in the technical file along with the original risk assessment; details of how to put the gate into manual operation in case of failure; guide for safe use of gate; guidance on how to ensure continued Gate Safe compliance; location of control cabinet keys and manual release keys; details of key contacts and the maintenance log book.

Service for architects

Gate Safe provides an online architect service (www.gate-safe.org/educate/architects/) and Gate Safe visualiser to enable architects to develop the desired safe gate specification. In addition, architects are welcome to join the half-day Gate Safe Aware

training course to improve their understanding of automated gate safety. Details of the next training course can be found on the Gate Safe website www.gate-safe.org.

HOW TO SPECIFY A SAFE GATE



Start Here

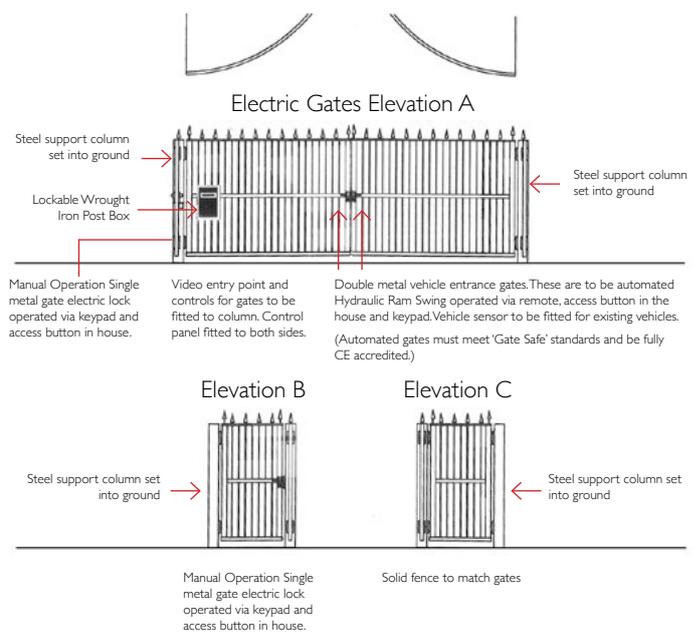


The Safe Gate Visualiser guides you through nine easy steps to help you specify, design and install automated gates to the latest safety standards.

GET STARTED!

Use of this site constitutes acceptance of our [Terms and Conditions](#).

Input into specification review



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Finding an installer

Always seek out a Gate Safe Aware trained installer who has undergone the specialist training required to understand the protocol required to ensure a safe and compliant automated gate installation. Suitably trained

installers can be found on the Gate Safe Aware installer register featured on the Gate Safe website (www.gate-safe.org).

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How to Find an Installer

Enter your postcode in the search box to the left.

The number of nearest installers you have selected will be shown on the map with address and contact details given in the boxes to the left.

Clicking on the map icons or the installer details will highlight the relevant location causing the map pin to animate.

Our webmaster would also like to receive any feedback regarding this functionality in order that we can iron out any issues - you can contact him [HERE](#). Please note we are aware that the map is difficult to use on a mobile phone and are working on this at present.

To find your nearest Gate Safe Installer, please enter your postcode in the box below

CT4 6AB New search

1: Jacksons Fencing Ltd 2 mile(s)

Stowing Common
Ashford
Kent
TN25 8BN
UK
01233 750393
Website
security@jacksons-fencing.co.uk

[Map](#) | [Directions](#)

2: Kingsnorth Electrical Ltd 10.9 mile(s)

Kingswood
Bromley Green Road
Ruckinge
Ashford
TN26 2EG
UK
07798 886803
Website
mark@kingsnorthelectrical.co.uk

[Map](#) | [Directions](#)

3: [Name obscured] 16.6 mile(s)



Legal Responsibilities

Architects:-

- Construction (Design & Management) Regulations 2015
- Health and Safety at Work Act 1974
- The Workplace (health, safety and welfare) Regulations 1992
- Provision and Use of Work Equipment Regulations 1998
- Supply of Machinery (safety) Regulations 2008
- 18th edition BS 7671 the IET Wiring Regulations

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Important contacts

Gate Safe www.gate-safe.org / info@gate-safe.org / 01303 840 117

Trading Standards: www.tradingstandards.gov.uk/

Health and Safety Executive: www.hse.gov.uk/work-equipment-machinery/powered-gates/introduction.htm

Glossary of terms

For a full glossary of automated gate related terms, visit the Gate Safe website, www.gate-safe.org.

Gate Safe working together with IOSH

GATE SAFE IS PROUD TO BE SUPPORTED BY THE FOLLOWING ORGANISATIONS



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