

GOOD DESIGN

This brief guide is recommended to give general assistance when designing an Automatic Gate, Door or Barrier system. If more detail is required please contact us accordingly, before any works begin on site. More information is available within this web site and we would appreciate any feedback, so that we can continue to improve the service this site has to offer.

INTRODUCTION

Layout	It is our policy to describe the location of items of any system as “Viewed From Outside” the property. Therefore the position of the component in question, e.g. Key switch would be drivers side or on the right hand side, as viewed from the road, not from the property. With systems that are located within an estate, the outside would be the side furthest from the main building or nearer to the most local access road off site.
Systems	A system is a single installation across a single access route. More than one system may be linked or even work together as a combined system or a combination of systems. However it is important that each system has its own unique identification whether it be by name or reference number.
Associated Items	Items such as Garage Door Operators, Security or Fire Alarm Systems, Specialised Access Control and Surveillance Systems maybe linked to a Gate, Door or Barrier installation either directly or indirectly. These items may be the responsibility of others, but will have an effect on the performance of the main system.
Measurements	Most measurements are given in millimetres or meters and are always subject to site confirmation. Gates and Garage Doors are usually measured Width first Height second e.g. 3.6m x 1.8m The height being 1.8m. Barrier beams can often be measured by opening width plus the amount lost behind the barrier its self (the ordering size can therefore be larger than the opening)

GENERAL DESIGN GUIDE

Users requirement	The performance of the system should fulfil the needs of the user. Therefore it should be designed with the users needs in mind and if possible, by liasing with them.
Local Area	The system will need to work effectively against all the potential hazards the local environment will throw at it. Therefore an Automatic Lift Barrier across a car park opposite a football ground would not be the ideal choice, as fans from the losing team could well vandalise it every Saturday after a match. A durable “Fail release” Automatic Swing Gate would be more suitable.
Environment	Once again the system will need to operate against potential environmental conditions, such as Coastal weather and salt filled rain, where the need for galvanising of the metal-work and detailed finishing is highlighted.
Location	The location of the system may have a bearing on its safe use and the level of convenience offered by it. E.g. Systems installed right by a main road could cause an obstruction if large vehicles are delayed in gaining access.
Access	The type of system may well have a direct affect on suitable access through the opening. For example, a sliding gate may well be best suited to control the entrance of a court yard, where space is prohibited.
Traffic flow	Every site is different and as such will have its own restrictions. Two-way traffic through a single opening is the most commonly found scenario. However separate entrance and exit systems are recommended where the budget and site layout allow. The level of use and type of traffic will have a bearing on the system type and its opening size.
Traffic lights	The long term affect traffic lights will have on a system is subject to each site’s detail. Lights are essential on systems that retract out of site, like Bollards or Road Blockers, so that the user doesn’t drive into them. However when directional traffic lights are used, drivers often follow a “Green Light” without adequate caution and accidents still happen. Traffic flow mirrors can be a better solution, as drivers become more cautious.

Pedestrians	<p>Pedestrian access through a vehicular route should always be avoided/discouraged. A separate gate or path is recommended where possible. Systems that have to cater for pedestrians should include adequate safety cover.</p> <p>NB. Wicket gates are not recommended on any automatic system.</p>
Roller shutters	<p>Most roller shutters are designed to work about 10 times a day and with regular maintenance will offer approx. 25 years service (100,000 operations). This rule is a good guide when considering a roller shutter or grille to secure the entrance to an underground car park. As the number of operations a day increases the life expectancy reduces accordingly, however, the risk of abuse and accidental damage increases dramatically. A shutter serving 50 car park spaces to an office block may well be subject to 125+ operations a day and as a result, could only be expected to last less than 2.5 years!</p>

SYSTEM CRITERIA

Domestic	<p>A domestic system is usually one that is installed across an access way of a private dwelling. Normally low usage, up to 20 operations a day.</p>
Multi-user	<p>A multi-user system is one that more than one/two families would use. Also an access point to a business premises or light commercial property.</p>
Commercial	<p>A commercial system is one that caters for large commercial traffic and is usually exceptionally wide.</p>
Failure status	<p>The failure status is a critical feature in respect to the long-term reliability of the system and its vulnerability to abuse. It determines whether the system fails “Secure” or “Release” during a power down state.</p>
Fail Secure	<p>Fail Secure means that the system is held locked, usually closed, during a power down/cut. Access is gained by use of a release key or device. This usually means that the operators are direct locking or non-reversible and is common in “Domestic” installations. However any undue force placed upon the gates will be directed to the operators accordingly and subsequent damage is likely.</p>

Fail Release	During a power down state, the system automatically reverts to manual operation. This format is ideal in “Multi-user” installations, where access is more important. Undue force is far less likely to cause damage to the operators. Also Emergency services can gain access more easily and as a result, the life of the system is enhanced accordingly.
Battery back-up	Battery back-up is used in a number of ways, sometimes providing a limited supply for the whole system but, more often than not, by giving a temporary supply to a component e.g. Supplementary locking or an Audio link facility. It is important to remember that the battery will run down so that the failure status should be considered without battery assistance (often a supply fault can be hidden until the battery runs flat).
Logic	The operational logic of the system is the cycle of events in which it runs. There are varied ways in which a system works, but most commonly used is “Fully Automatic Logic” the next is “Semi Automatic Logic”
Fully Automatic	Once the system is given a Command to open, it will time-out and close automatically (most user friendly).
Semi Automatic	Command to open and Command to close is needed with this logic. (Not suitable in multi-user installations).

PREPARATIONAL WORK

Ground levels	In EVERY case the “ground levels” have a direct effect upon the success of the system’s design and its performance. NB. Please see “Ground levels” within the “Preparation” section of this web site for details (to be found under “Products”).
Drive surface	Loose drive surfaces, unmade roads and suspect foundations are to be carefully considered. A poor sub-base is more likely to be affected by ground swell during flood or heavy frost, with drive expansion often hindering the performance of the system.
Cable runs	All cable runs should be installed using externally rated cables of adequate core dimension and spare cores where possible. All ducting should be “Anti-crush” flexible duct with sweep bends, no elbows and adequate access pits for servicing.

Support structures	The support structure of the system, whether it be a gate post or barrier stand, is one of the most important parts of an automatic system. Its stability directly affects the performance and reliability of the system. For more detail please go to “Support Posts” via “Gates” within the “Products” section of this web site.
Noise transfer	Noise from any system can be transferred directly to a neighbouring property. Every site has its own characteristics and as such, there is almost no guarantee against noise transfer. However, basic steps can be taken. The first is to avoid direct or indirect connection of the gate or operator onto a neighbouring property or living accommodation. (Use free standing supports). The next is to keep all contact points away from said property. (Free stand stops and locks). Avoid the use of shared foundations or fitting close to attached items (railings, walls, fencing etc).
Local noise	Local noise is more common at night when all sound is exaggerated. Therefore the location of the system and its type need to be considered carefully, especially near living accommodation. The vehicles using the system are also likely to make some noise, together with any communications product (Audio entry link system).
Immovable objects	All sorts of immovable objects need to be considered when designing a system. Local trees with roots and branches in the way, high voltage underground cables or drains, gas pipes, street lighting cables and water mains are all commonly found. With this in mind our recommendation is to erect the support structures before completing the manufacture of the gates, in case size alterations are required.
Potential hazards	It is wise to look forward and investigate if there are any plans to carry out local changes that may affect the performance of the system. For example, high-way alterations, re-landscaping or a new driveway etc.
Customers use	Systems have found themselves problematic due to customers changing the “type of use” an entrance was designed for. It is recommended that any potential change of use be discussed with the client and options given early on. A lot can often be done to accommodate a change of use when the right system layout, equipment, ducting and cables are allowed for.

PHYSICAL ELEMENT

Support posts	<p>Free standing box section steel support posts with duct entry and inspection plates, concreted 1m plus into the ground, are always recommended. Masonry may be added for cosmetic reasons, but it should not be relied upon alone. Minor impact from a car almost certainly causes greater repair works with brick piers, than a gate supported by the right steel. Also the operator often has a more suitable fixing off steel than masonry.</p> <p>The support should be strong enough not just to hold up the gate, but also to withstand minor impact or a reasonable number of people climbing over it, without failing.</p>								
Gate size	<p>The size of gates, doors or barriers vary from site to site. Most are required to be as wide as possible and high enough to give adequate security. With most automatic systems the smaller the opening the lower the cost to install and maintain, also the more reliable the system is.</p>								
Gate width	<p>Recommended vehicular widths are as follows;</p> <table><tr><td>Domestic swing gates</td><td>3000mm – 4000mm</td></tr><tr><td>Multi-user swing gates</td><td>4000mm – 5000mm</td></tr><tr><td>Commercial swing gates</td><td>4500mm – 6000mm</td></tr><tr><td>Sliding gates</td><td>3000mm – 10000mm</td></tr></table> <p>NB. All subject to height, weight, shape and site survey.</p>	Domestic swing gates	3000mm – 4000mm	Multi-user swing gates	4000mm – 5000mm	Commercial swing gates	4500mm – 6000mm	Sliding gates	3000mm – 10000mm
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Gate height	<p>Within reason height is far less important than width, but it may have an effect on weight and hinge stress.</p> <table><tr><td>Domestic gates</td><td>1200mm – 1800mm+</td></tr><tr><td>Multi-user</td><td>1600mm – 2000mm+</td></tr><tr><td>Commercial</td><td>1800mm – 2300mm+</td></tr></table> <p>NB. All subject to local planning and site survey.</p>	Domestic gates	1200mm – 1800mm+	Multi-user	1600mm – 2000mm+	Commercial	1800mm – 2300mm+		
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Gate shape	<p>Width has the most effect on the shape of gates recommended. The wider the gate the higher the load and stress that is on each hinge. The weight distribution of the gate will also determine stress at each hinge and as automatic gates are used far more than manual ones, hinge wear is an important consideration. General guide only, subject to site survey;</p> <table><tr><td>“Bow top” gates sweep up in the middle</td><td>2000mm leaf</td></tr><tr><td>“Flat top” gates are flat across the top</td><td>2500mm leaf</td></tr><tr><td>“Swallow top” gates dip in the middle</td><td>3000mm leaf</td></tr></table>	“Bow top” gates sweep up in the middle	2000mm leaf	“Flat top” gates are flat across the top	2500mm leaf	“Swallow top” gates dip in the middle	3000mm leaf		
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Gate material	As automation is of an engineering nature and requires stability within the material used, “Steel” is always recommended over “Timber”, With timber gates there is always a compromise between cosmetic looks and system reliability. Timber is a live material that is always moving and will often split and crack naturally even without automation. However automation of timber products can accelerate their natural movement.
Gate construction	<p>Each gate should be constructed to suit its opening size and method of control. Rectangular hollow section outer frame of 40mm+ square is recommended, together with medium/thick wall hollow section elsewhere (to avoid excessive weight and yet aid in stability).</p> <p>Close-board Infills, Sheeting or Cladding should be avoided where possible. They provide privacy but create problems with wind resistance and system performance, especially in exposed locations.</p> <p>Palisade gates and similar shaped Infills, create high levels of drag against the wind and as a result, have significant problems in windy conditions.</p> <p>The hinges should be of a high use type, suitable for the proposed method of control and adequately maintainable.</p>

OPERATORS

Gate operators	There are a number of types of operator on the market today and choosing the right one is important. Size Of The Gate, Level Of Use, together with the Failure Status required all have an effect upon the operator that is recommended. The most popular and cost effective type of operator is the Ram unit, that fits to the back of the gate. However, the choice of most architects is the Undergate Jack unit for cosmetic reasons and sometimes additional opening (beyond 100 degrees). Our recommendation will always be for the operator that is most suitable long-term.
Jacks v Rams	<p>Undergate Jack operators usually control the gate by moving the pivot point of each gate leaf. This makes the unit ideal cosmetically and also allows for up to 180 degrees of leaf swing as required. We recommend they are only suitable for “Domestic” systems in a low risk of abuse environment.</p> <p>Ram units are simpler to install and maintain, they are visible to otherwise ignorant abuse and as they fix approx. 1m along each gate leaf, they have a major mechanical advantage over Jacks. Therefore they are far more suitable on Multi-user systems.</p>
Garage doors	Both side hung and up & over doors can be automated, but either need to work well manually before automation has a chance. Please ring our sales team for more details.

EQUIPMENT

Command

Command controls are the items that give systems a signal to operate. There are currently about a dozen ways of giving command, most of which are listed within the “Products” section of this web site.

Usually systems have more than one means of command, with radio controls the most popular. The successful performance and life expectancy of a command item is subject to its ; Environmental suitability, Location and User friendliness.

Safety devices

Safety devices are the items that stop the system from closing while they detect an obstruction. There are about half a dozen ways of providing system safety, most of which are listed within the “Products” section of this web site.

Very few systems use safety devices for stopping the system from opening, but it is possible. The main objective of good safety cover for any system is to prevent impact from occurring. .It is the moving vehicle that causes most damage, not the moving gate or barrier and most accidents happen because the vehicle is driven into a closing system. Therefore devices should be chosen and located to give the best Safety cover for each individual site.

The most common safety item is a pair of photoswitches S1 used in most domestic installations. However, as the detection area is a thin beam, larger coverage devices are better such as induction loops S2.

A combination of safety devices is good practise however it inevitably becomes more of an investment.

All systems should have adequate safety cover and the higher the usage of the system the more likely the chance of accidents.

Miscellaneous

Miscellaneous items are the other essential components of a system that make it complete. Over a dozen items are shown within the “Products” section of this web site and include Enclosures, Locks, Communications, CCTV, Letterboxes, Lighting etc.

These items are often over looked and do not seem important until the installation is all but finished. If consideration is not given early enough the cost of including such items can be far greater than it need be. It is good practise to allow for the addition of controls and equipment by installing the right ducting and spare cores within each cable run.