



HEALTH AND SAFETY
AUTHORITY



Guidelines on the Safety of Powered Gates

This guidance will address in detail two types of powered gates: sliding gates and hinged gates.

4.1 Sliding gates

Figure 1 shows a plan and elevation view of a cantilever sliding gate. Figure 1(a) shows a sliding gate on tracks. Areas A to H show the areas where injury could potentially be caused.

The bullet points A to H describe these hazards and the type of measures needed to control the risk from each hazard. Figure 2 shows how safe edges can be installed to prevent crush and entrapment injuries.

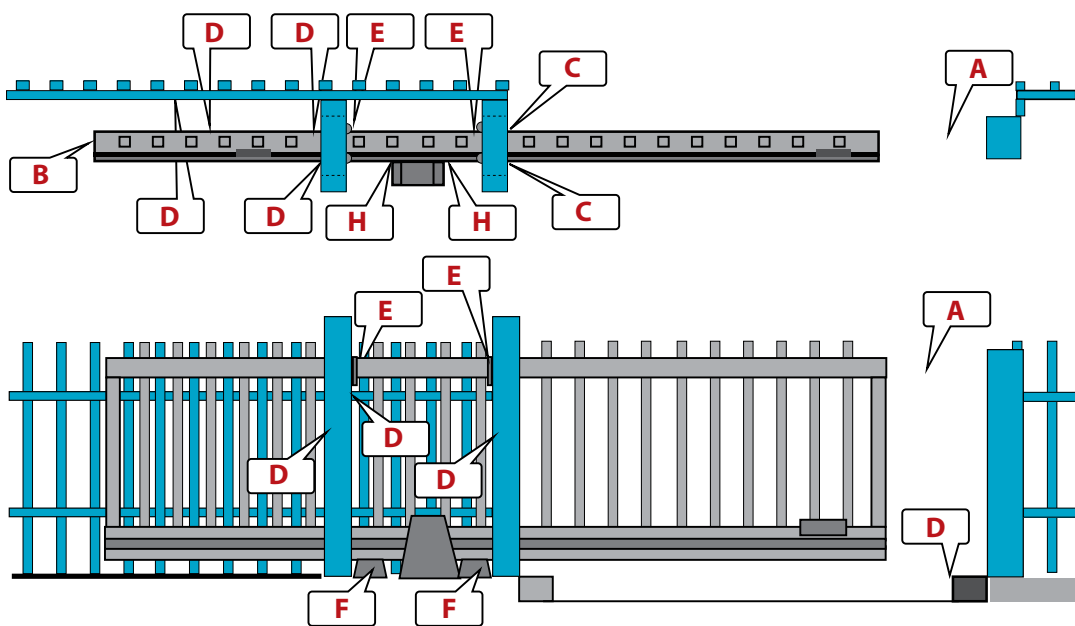


Figure 1: Plan and elevation view of a powered cantilever sliding gate

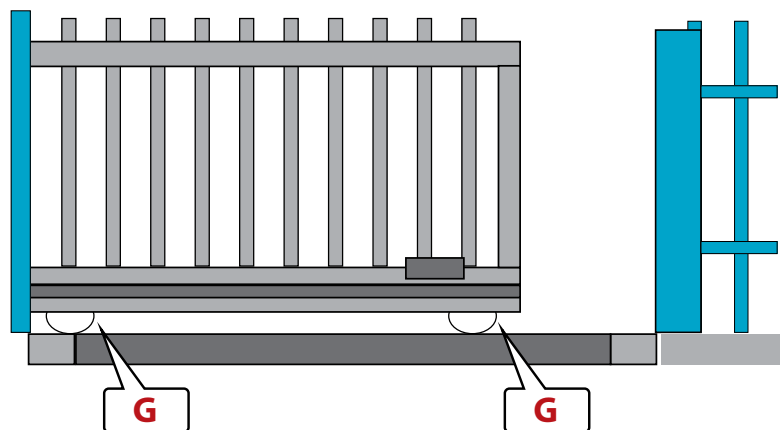


Figure 1(a): Opening area of a tracked sliding gate

A Main closing edge: crush and impact hazards controlled by either inherent force control, safety edges, light/radar curtaining or by having the gate hold-to-run.

Inherent force-control can be provided by intelligent drive units that cause the gate to reverse when an obstruction is sensed.

Safe edges are sensitive rubber switching strips which, when contact is detected, send a signal to the gate controller to reverse the movement of the gate.

Light/radar curtaining means placing a curtain of light or radar in front of the danger areas. If the curtain is breached while the gate is operating, the gate will reverse its direction. This may be installed to give protection to vehicles primarily but it will also prevent inadvertent contact with pedestrians.

Hold-to-run means that the gate can only be opened or closed by a person positioned in a safe area, consciously placing continuous pressure on a controller.

B Main opening edge: crush and impact hazards (crush hazard exists whenever a leaf closes to within 500mm of a fixed object, impact hazards are present throughout movement) controlled by either:

- Guarding
- Safety distances - see Figure 4
- Inherent or safety edge derived limitation of forces
- Hold-to-run or light/radar curtaining

C Entrance portal support frame: shear or draw in hazards controlled by either:

- Safety distances
- Safety edges – See Figure 2
- Hold-to-run or light/radar curtaining

D All other support frame, leaf or perimeter: shear and draw in hazards controlled by either:

- Guarding
- Safety edges
- Hold-to-run or light/radar curtaining

E Upper guide/roller draw in hazards controlled by either:

- Guarding
- Hold-to-run or light/radar curtaining

F Lower cantilever gate rolling gear hazards (see Figure 1) controlled by either:

- Lower edge slot for internal rollers
- Guarding for external or exposed rollers

G Lower tracked gate rolling gear hazards - see Figure 1(a) controlled by:

- Guard to within 8mm of ground

H Drive unit draw in hazards controlled by:

- Guard

Notes:

The preferred method of protecting risks B, D, E and H is to guard off the entire run-back area of the gate and provide a maintenance hatch for drive unit access.

List A to H is not exhaustive, other examples may exist depending on design detail.



Safe Edges on leading edge and entrance portal

Figure 2: Safety Edges installed on powered gates. If these make contact with a person or object the gate is automatically prevented from closing further

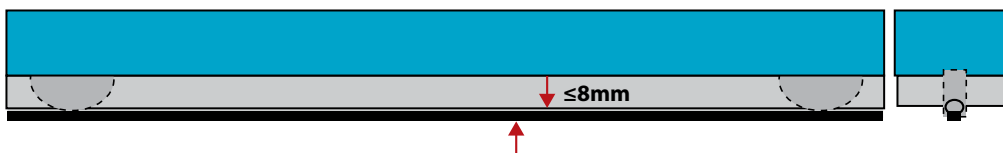


Figure 3: Guarding of base of powered gate

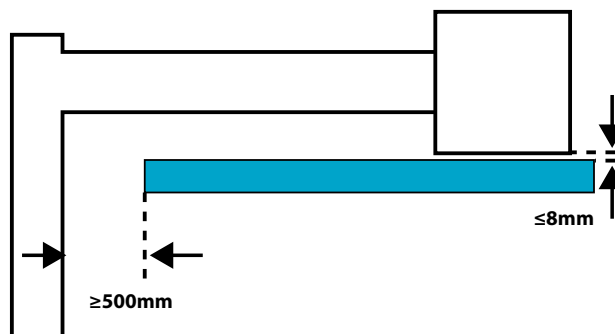


Figure 4: Gaps at gate end stopping position (when opened) should be as shown, to prevent crushing. Alternatively this area should be guarded

4.2 Hinged power gates

Hinged gates have some similar hazards to sliding gates. However, the fact that the gates swing open and closed presents some other hazards that must also be considered.

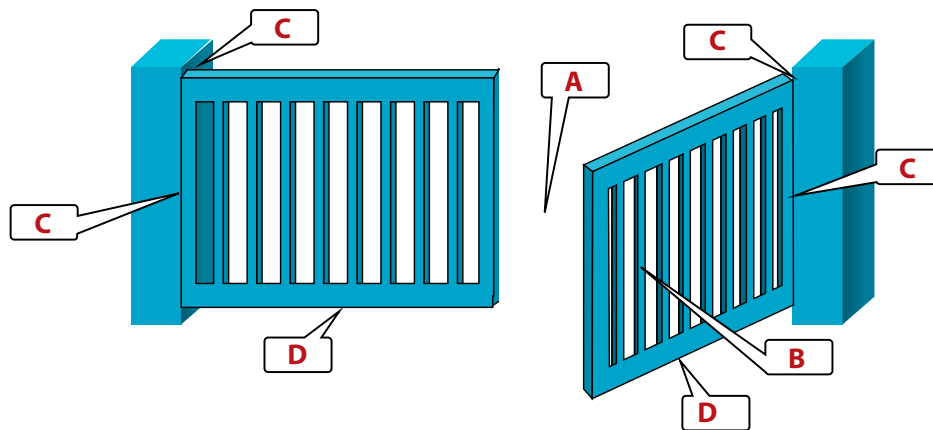


Figure 5: Elevation view of powered hinged gates including hazardous areas A-D

A Main closing edge crush and impact hazards controlled by either:

- Photoelectric beams on the closed face in combination with inherent or safety edges or limitation of forces
- Hold-to-run or light/radar curtaining

B Opening crush and impact hazards controlled by either:

(Opening crush hazards exist wherever a leaf opens to within 500mm of a fixed object, impact hazards are present throughout movement)

- Safety distances, for the **crush** element only - see Figures 6 and 7
- Inherent or safety edge limitation of forces
- Hold-to-run or light/radar curtaining

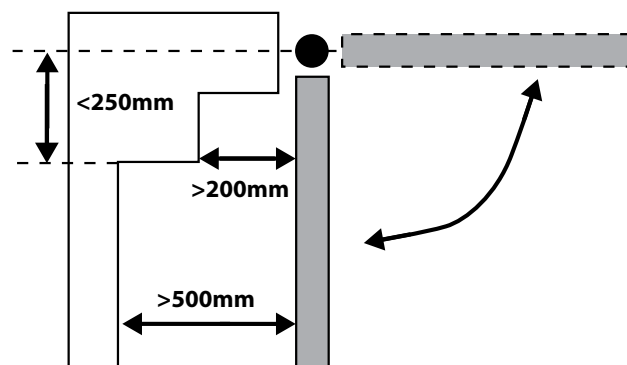


Figure 6: Safety distances to reduce crushing hazard

C Hinge area crush, draw in or shear hazards controlled by:

- Safe design hinges - see Figure 7
- Guards
- Safety edge
- Hold-to-run or light/radar curtaining

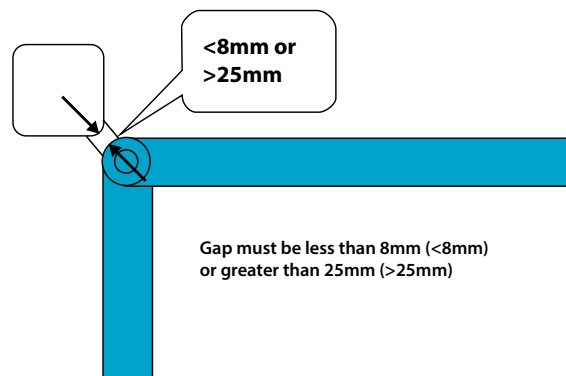


Figure 7: Safe design hinge

D Lower edge shear and crush hazards controlled by either:

- Safe distances in combination with inherent limitation of force - see Figure 8
- Safety edges on both sides of lower opening edge
- Hold-to-run or light/radar curtaining

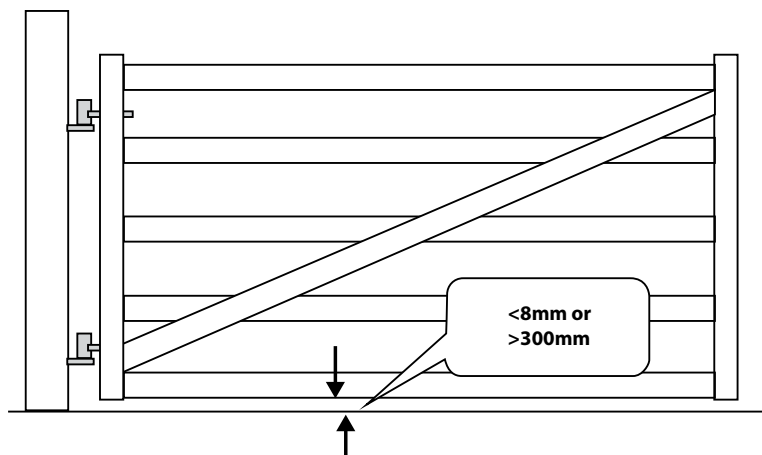


Figure 8: Safe distances to reduce crush and shear hazards of lower edge

Note:

This list is not exhaustive, other examples may exist dependant on design detail. Nonetheless, all hazards must be revealed by assessment and controlled.

4.3 Overview of safety measures

An overview of the measures which may help to reduce risk:

- controlling separation distances between fixed and moving parts to reduce hazards from crushing, shearing and drawing-in points;
- Ensuring adequate separation distances between the control panel and the nearest danger point on the gate so that the user is not in a dangerous position and people cannot reach through a gate to operate a control panel on the other side;
- installing guards, for example a fixed guard to cover mechanical trap points such as guide rollers or sprocket drives;
- providing leaf surfaces that are smooth and free of parts that protrude which could catch people's clothing;
- operating the gate in hold-to-run mode;
- limiting the forces, for example protection built into the drive system; and
- installing sensitive protective equipment such as pressure sensitive strips (safety edges), safety sensor flooring, light/radar curtains or similar protective systems.

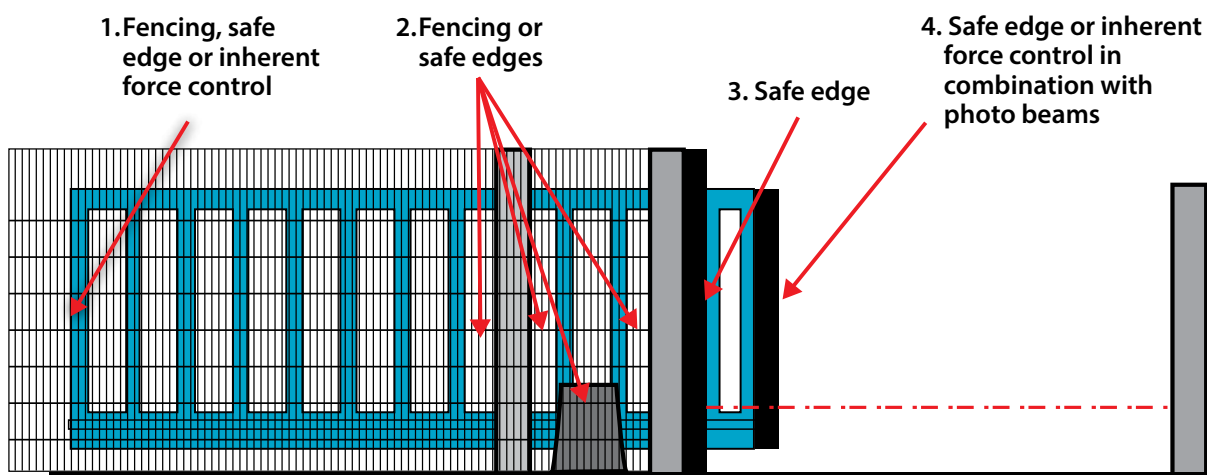


Figure 9: Control measures to protect users and members of the public