

# Case Study 1 – Manually Opening a Gate

## Based on two actual incidents

### Background

The management team of a concrete-product fabrication company, 'ABC Concrete Fabrications Pty Ltd', identified the need to improve its factory site security and safety. One aspect of this was to install a security gate to the main access roadway, with the aim of controlling site access for both traffic and pedestrians.

ABC Concrete Fabrications approached three companies to tender for the gate works. The three tender submissions, each including design proposals and associated quotes, were reviewed by ABC management.

'Gateworks Pty Ltd' was the successful tenderer; winning the contract to design, construct and install an electrically operated sliding steel gate, 4.5m wide and 2.2m high; to allow for heavy vehicle access.

Saxcon Design Pty Ltd was the structural engineering firm that provided the structural steel design for the foundations, support framework and the gate itself.

Gate operation was via key-pad: with employees to be given a key code (changed 'regularly') and non-employees required to phone the admin office for entry to the site. For vehicle access, a proximity device was buried in the roadway, with a key-pad and code for exit from the site. The electric-drive system was fitted with a 'bypass' system (only accessible from within the factory site) to allow manual operation of the gate in the event of power failure or similar.

### The Incident

Approximately 18 months after installing the gate, there was an incident caused by the heavy steel gate becoming disengaged from the support structure, resulting in a fatal crush injury.

Ms X (not employed by ABC Concrete Fabrications) had arranged to drive home an employee of ABC Concrete Fabrication. The employee used the gates as a pedestrian to exit the factory site, with the gates opening correctly once he had entered the key-code on the keypad. However, the sliding gate failed to close fully once he had exited the site.

He operated the motor 'bypass' system and started to manually close the gates, as this type of problem had occurred previously.

Ms X came to the assistance of the employee and as they were pulling, the heavy gate closed. The front edge of the gate moved out of its supporting structure and fell on Ms X.

A crane had to be used to lift the steel gate from where it had fallen.

Ms X subsequently died from the injuries she sustained.

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## Outcomes

One person was killed.

ABC was prosecuted for failing to ensure the health and safety of all of its employees and persons other than its employees, namely Ms X.

Gateworks was charged with two offences, arising out of the same facts and were fined \$77,500 for each offence.

Gateworks no longer conducts business.

Saxcon was charged with one offence under the OH&S Act and was fined \$185,000.

## Investigation Findings

Saxcon Design Pty Ltd was the structural engineering firm that provided the structural steel design for the foundations, support framework and the gate itself.

ABC Concrete Fabrications owned and operated the site where the fatality occurred.

Gateworks Pty Ltd specified, supplied, fabricated and installed the sliding gate and associated operating machinery and was also contracted for servicing and repairing (if/when required) the sliding gate.

'Smith & Son Pty Ltd', a small local general building contractor, prepared and installed the concrete foundations for the gate assembly.

Following the gate installation contract being awarded to Gateworks, but prior to the commencement of gate installation, Gateworks was bought by a larger contractor – 'Gates-R-Us Pty Ltd'.

Saxcon Design prepared the foundation specification, which was found to be 'to code' and deemed suitable for the site conditions. No evidence was found of the foundations (preparation/supplied concrete specification/steel reinforcing/etc.) being inspected prior to the installation of the foundations.

Failure of the gate auto-mechanism was a reasonably frequent occurrence, but generally it 'reset itself' following manual bypass and opening/closure of the sliding gate. Due to the fact the gate 'reset itself', no investigation/permanent repair had been performed.

The gate assembly, including structure/operating mechanism/foundations, had not been formally inspected since the installation of the gate. ABC Concrete Fabrications maintenance staff occasionally applied grease to the specified lubrication points of the gate, but this was not formally included in any scheduled maintenance plan.

Saxcon Design failed to include adequate device(s) to prevent the sliding gate falling during manual operation. The gate installer (Gateworks/Gates-R-Us) also failed to identify or rectify this falling.

Separate pedestrian access had not been considered or included when the security/safety upgrade was being discussed by ABC management.

Manual operation of the gate and associated risks had not been considered at any time.

The take-over of Gateworks by Gates-R-Us during this sliding gate project may have resulted in insufficient review or management of the project – including design/fabrication/installation/maintenance and inspection requirements.

There appears to have been some communication breakdown, resulting in confusion regarding which company was responsible for various aspects of the project. This confusion was compounded by the number of people and companies involved in the project (ABC/Saxcon/Gateworks/Gates-R-Us/Smith & Son) and the takeover of Gateworks by Gates-R-Us.

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## Incident Review

### Primary message: Safe Design

The incident was the result of failure in the design. Application of the appropriate engineering processes at any point up to the incident may have prevented it. The key events and process which could have prevented this incident are as follows:

- Initial design review/verification/validation should have identified the lack of a mechanism to stop the gate falling.
- Initial design review/verification should have identified the lack of pedestrian access and the need for a backup system in case the main control mechanism failed.
- Hazard Identification early in the design would have recognised the hazards associated with manually operating the gate; the design could have been modified to eliminate this hazard.
- Proper Maintenance and inspection plans may have identified the issue and proper communication plan may have triggered an investigation and corrective action.

### Secondary Message: Safe Operation and Maintenance

Did management at ABC Pty Ltd know about employees having to use the manual override?

ABC Pty Ltd should have had a process for hazard/safety issue reporting, investigation and follow-up.

Even though this would only have found the hazard after design, it would at least have provided an opportunity to investigate and address the situation.

A hazard reporting process should:

- Be an EASY process.
- Be visibly encouraged and supported by management and supervisors.
- Result in action and feedback to the report originator.

This Case Study is based on the following real incidents (see links below) which occurred in 2003 and in 2005. In both cases the electronic control had malfunctioned, forcing the gates to be opened manually.

## Additional Resources

*GD News*. (2010). Retrieved from Gillis Delaney Lawyers: <http://www.gdlaw.com.au/wp-content/uploads/2013/12/July10.pdf>

*Inquest into the death of Katherine Alison Jones*. (2006). Retrieved from Queensland Courts: [https://www.courts.qld.gov.au/\\_data/assets/pdf\\_file/0009/131985/cif-jones-ka-20061206.pdf](https://www.courts.qld.gov.au/_data/assets/pdf_file/0009/131985/cif-jones-ka-20061206.pdf)

Not the first time: Firm linked to another death. (2006). Retrieved from <https://www.sunshinecoastdaily.com.au/news/scd-not-the-first-time-firm-linked-to-another-deat/316222/>