

Hazard Alert

Steel erection and the use of chemical anchors



Government
of South Australia
SafeWork SA

Summary of incident

There have been incidents where steel columns have collapsed during building construction, all involving the use of chemical anchorages.

Drill-in anchors (chemical or mechanical) are sometimes used where cast-in bolts have been placed in the wrong positions, or when changes to the design are required after the concrete has been cast.

If the anchorages have not been installed correctly, the structural component connected to the anchorage system may become unstable and collapse before the building construction is completed.



Chemical anchors set in position

Possible causes

- Not adhering to the manufacturer's specifications or recommendations when installing the chemical anchors.

- Mixing different brands of chemical anchors or using anchors (including sizes) not specified by the designer.
- Not following the safe work method or the design engineer's instructions during the erection procedure.
- Changes in the field carried out without consulting the design engineer.
- Detaching support of the column from the crane (or other temporary supports) prior to installing permanent braces, or connecting to other building components required for structural stability.

Action required

- The use of chemical anchors (and mechanical anchors) must comply with the manufacturer's instructions. These instructions cover the drilled-hole size and depth, installation procedure and cure time. The cure time is temperature sensitive; substrate temperature (not air temperature) must be considered. Inclement weather and moisture must be avoided when installing the bolts.
- Do not mix different brands of anchors.
- Erection procedure must comply with the safe work method and / or engineer's instructions. If changes to the design are necessary, they must be referred to the designer for approval prior to implementation.
- Follow the appropriate Safety Data Sheet where adhesives are used.
- Verify chemical anchors are satisfactorily set / cured (e.g. by torque test) before allowing the column to take any structural loads.

Further information

AS 3828 Guidelines for the erection of building steelwork.

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