# LEARNING FROM ACCIDENTS

## Safety Alert from SEA (India)



SEA (INDIA)

HQ & Correspondence address: Safety Engineers Association

G1, 95/5 Sundaramurthy Gramani Street, Virugambakkam, Chennai - 600 092

Tel: 044 - 23774060; Mob: 9952005534, E Mail: seaindiachennai@gmail.com;

URL: http://www.safetyengineersassociation.org



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**Title:** Collapse of formwork during concreting

## What Happened

- The roof concrete work was planned, and the work started at 11:30am on arrival of the first Ready Mix Concrete (RMC) truck
- The slabs in these sections are to be casted. All these jobs are performed at 10m level
- Three masons employed by the contractor were using the vibrator to level the concrete in the beams / slab while the 20 workers from Ready Mix Concrete (RMC) contractor were engaged in pouring the concrete on the slab
- At 15:30 pm, the slab between the columns collapsed due to the buckling of its formwork supports leading to the collapse of the entire roof slab under construction

## Photographs

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## What went wrong

- Load (CT Props) were not secured before picked up for lifting with connecting pins
- Poor awareness of the team about this hazard while collecting the CT props for lifting
- The staging arrangement provided at site was not compliant with the design note of the contractor.
- Spacing of horizontal braces were found in the range of 5m to 8m (design value is 3m)
- Spacing of vertical props was more than the design value (1.5m), average gap of 3.5m.
- Uniformity in the spacing of horizontal braces and vertical props were not maintained.
- Inspection of formwork and its staging arrangement prior to pouring of concrete was not carried out. No check list as per IS 14687: 1999 for checking of formwork was available at site.
- Improper engineering of the support structure for formwork installed for concreting of the roof slab.
- Inadequate Quality Assurance Program for design, construction and execution of civil works.

## Key Lessons & Corrective Action

- Appropriate design of formwork, supporting arrangements, auxiliary requirements etc. conforming to latest Indian Standards and manufacturer recommendations shall be followed for the construction activities.
- The client should review the design, its basis, drawings, checklists etc. prepared by contractors for acceptance before taking up construction.
- All formwork and its supporting arrangement, scaffolding and other load bearing structures etc. shall be inspected by competent engineers
- Client shall ensure proper management oversight over the activities of its contractors to confirm that safety is ensured in all the activities
- Pour card system to ensure compliance to formwork schemes & design.
- Client shall issue the clearance certificate to contractor before concreting work.
- Quality Assurance manual and system should be in place and followed.