



Temporary Structure Stability – Bracing, Shoring, and Collapse Prevention

Temporary structures—formwork, falsework, reshoring, braces, and temporary supports—are a frequent source of serious injuries and fatalities. Failures often occur suddenly due to inadequate bracing, overloading, poor foundations, or unapproved changes. Temporary works must be treated as engineered systems, not improvised solutions.

1. Core Stability Principles

Temporary structures must safely resist:

- Vertical loads: fresh concrete, rebar, workers, tools, equipment
- Lateral loads: wind, concrete pressure, vibration, equipment contact
- Unbalanced loads: partial pours, uneven loading, settlement, sequencing

Key Rule: If removing one component (brace, shore, connection) could cause collapse, the system lacks redundancy.

2. Bracing Requirements

- Install continuous, positive bracing—fully connected and anchored
- Use triangulation (X or knee bracing) to prevent racking
- Anchor braces to structural elements capable of resisting load direction
- Maintain braces at corners, ends, and changes in elevation
- Clearly mark and protect “DO NOT REMOVE” braces
- Re-inspect after wind events, impacts, or layout changes

Common Failures: missing corner braces, shallow brace angles, attachments to non-structural elements, brace removal for access.

3. Shoring & Reshoring (Forms & Supports)

- Use rated, compatible components only (frames, posts, jacks, pins)
- Keep shores plumb and aligned—leaning shores lose capacity rapidly
- Provide solid base support (mudsills/cribbing on stable, compacted ground)
- Maintain a continuous load path from slab to ground or lower levels
- Secure wedges and screw jacks; avoid stacked or loose shims

Reshoring: Follow the engineered stripping/reshoring sequence. Maintain reshoring until concrete reaches required design strength. Do not stockpile materials on green or partially supported slabs

4. Formwork Stability

- Design for lateral concrete pressure (placement rate, slump, temperature)
- Install all ties, walers, and strongbacks as specified—no substitutions
- Provide safe access; workers should not climb bracing or form ties

Stop Work Immediately If: Unexpected movement, deflection, bulging, or settlement occurs. Connections loosen, crack, or make unusual noises. Bracing or shores are found missing or altered

5. Collapse Prevention Checklist

- Before Work: Temporary works plan reviewed and approved. Soil/base conditions verified. Bracing and shoring fully installed and anchored.
- During Work: Control loads—no unplanned stacking or equipment access. Maintain all bracing; changes require authorization. Inspect after weather events or impacts. Enforce exclusion zones.
- Before Removal: Verify concrete strength. Follow approved stripping/reshoring sequence. Maintain stability until permanent structure is fully engaged

6. Roles & Responsibilities

- Competent Person: inspects daily, authorizes changes, initiates stop-work
- Foreman/GC: controls sequencing, loading, and brace protection
- Safety Manager: verifies plans, training, and inspections
- All Workers: report movement or instability immediately

Bottom Line: Temporary bracing and shoring are life-safety systems. If they are not properly designed, installed, inspected, and protected from field changes, collapse risk is high.