



NAC Executive Insights

Safety Insight: Temporary Works Failures

Key Points

- Temporary works—such as scaffolds, shoring, formwork, and demolition supports—are among the most failure-prone elements in construction.
- These systems are often under-designed, overloaded, prematurely removed, or inadequately inspected, especially when treated as secondary to permanent structures.
- Failures in temporary works disproportionately result in fatalities due to their proximity to active work zones and their role in supporting unstable or transitional loads.
- Governance interventions—including sealed temporary works designs, staged load case analysis, and inspection protocols—are essential to mitigate risk.
- This insight outlines the operational signature, governance triggers, and training priorities needed to address this failure mode.

The Hidden Risk Beneath the Permanent Structure

In construction, temporary works are everywhere—but rarely in the spotlight. They support formwork during concrete pours, brace excavations, hold up demolition debris, and provide access through scaffolds and platforms. Yet despite their ubiquity, temporary works are often treated as expendable, improvised, or outside the scope of formal engineering review.

This oversight is dangerous. Temporary works are transitional by nature, but their failure is anything but temporary. When scaffolds collapse, shoring gives way, or formwork fails mid-pour, the result is often catastrophic. These failures tend to occur in active zones, where workers are directly exposed to falling debris, structural collapse, or sudden instability.

What makes temporary works so risky is their invisibility in governance structures. They are frequently excluded from sealed design packages, omitted from pre-task planning, and inspected only informally. Yet they carry loads, resist forces, and protect lives—just like permanent structures.

Representative Case: Scaffold Collapse During Façade Retrofit

During a façade retrofit on a mid-rise commercial building, a suspended scaffold failed under wind loading and uneven weight distribution. The scaffold had been erected without a sealed design, and the anchorage system was improvised on-site. No staged load case analysis had been performed, and no inspection had been logged prior to use.

The collapse killed one worker and injured two others. The investigation revealed that the scaffold exceeded its rated capacity, lacked lateral bracing, and had been exposed to wind gusts above design thresholds. OSHA citations were issued under 1926.451 and 1926.502, but the root cause was deeper: temporary works had been treated as a field-level responsibility, not an engineered system.

Why This Failure Mode Persists

Temporary works failures are often seen as isolated incidents, but they stem from systemic blind spots in construction governance. Several factors contribute to their recurrence:

- **Design Gaps:** Temporary works are frequently erected without sealed plans, relying on vendor specs or field improvisation.
- **Load Misjudgment:** Crews often underestimate the loads imposed on shoring, formwork, or scaffolds—especially during transitions.
- **Premature Removal:** Supports are sometimes removed before concrete cures, demolition is complete, or adjacent systems are stabilized.
- **Inspection Shortfalls:** Temporary works are rarely subject to formal inspection protocols, and documentation is often missing.
- **Training Deficits:** Field crews may lack the training to recognize instability, assess load paths, or verify anchorage systems.

These failures are not just technical—they are governance failures. They reflect a lack of procedural control, engineering oversight, and cultural emphasis on temporary systems.

Governance Triggers and Operational Controls

To address this failure mode, governance must elevate temporary works to the same level of scrutiny as permanent structures. Recommended controls include:

- **Sealed Temporary Works Designs:** All scaffolds, shoring, formwork, and demolition supports above defined thresholds must be governed by PE-sealed plans.
- **Staged Load Case Analysis:** Designs must account for construction loads, wind exposure, dynamic forces, and transitional states.
- **Inspection Protocols:** Temporary works must be inspected before use, after environmental events, and at defined intervals—with documentation.

- **Removal Permits:** Supports must not be removed without engineering approval and verification of structural readiness.
- **Anchorage Verification:** All suspended systems must have traceable anchorage checks tied to design specifications.

These controls are not optional. They are essential to prevent collapse, protect workers, and ensure traceability in the event of failure.

Training Priorities and Cultural Shifts

Temporary works require specialized training—both technical and cultural. Recommended training modules include:

- **Scaffold and Shoring Literacy:** Crews must understand load ratings, bracing requirements, and failure modes.
- **Formwork and Pour Sequencing:** Training should cover curing times, pour rates, and staged removal protocols.
- **Anchorage and Suspension Systems:** Workers must be trained to verify anchorage, assess wind exposure, and recognize instability.
- **Regulatory Compliance:** OSHA 1926.451, 1926.703, and ANSI/ACI codes must be embedded in daily practice.
- **Case History Briefings:** Real-world failures should be studied to reinforce the consequences of temporary works neglect.
- **Safety Culture Activation:** A mature safety culture ensures that temporary works are not treated as secondary or improvised. Toolbox talks, Accident Hazard Analyses, and pre-task planning must embed temporary works risk into daily routines. Leadership must model safety-first behaviors, empower stop-work authority, and reinforce the expectation that every crew member is responsible for identifying and mitigating instability.

This training must be reinforced by a cultural shift: temporary works are structural systems with life-safety implications. Their integrity depends not only on engineering rigor—but on a shared safety culture that prioritizes vigilance, accountability, and continuous improvement.

Why This Insight Matters

Temporary works failures are not rare. They are recurring, deadly, and often preventable. What makes them especially dangerous is their invisibility—both in design documentation and in governance

structures. When scaffolds collapse or shoring gives way, it's not just a technical failure. It's a failure of oversight, planning, and accountability.

This Executive Insight provides a roadmap for prevention. It shows where engineering must intervene, where inspections must be formalized, and where training must evolve. It's a call to treat temporary works as structural systems—not field improvisations. Because when they fail, the consequences are permanent.

About the Author

Bob Prieto was elected to the National Academy of Construction in 2011. He is a senior executive who is effective in shaping and executing business strategy and a recognized leader within the infrastructure, engineering, and construction industries. Bob received the 2024 ASCE OPAL Award (Outstanding Projects and Leaders) for his Outstanding Lifetime Achievement in Management.

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