Concrete and Formwork: Pinch Points and Caught-In/Caught-Between Hazards

Federal OSHA 29 CFR 1926 Subpart Q (1926.701 through 1926.706), Subpart O, and the General Duty Clause

OBJECTIVE

To recognize and control pinch points and caught-in or caught-between hazards during concrete and formwork operations, in line with OSHA 29 CFR 1926 Subpart Q (Concrete and Masonry, 1926.701 through 1926.706), Subpart O (Motor Vehicles and Mechanized Equipment), and the General Duty Clause.

INTRODUCTION

Caught-in or caught-between incidents are one of construction's Fatal Four. They happen when a worker is squeezed, crushed, or pinned between objects, or pulled into moving machinery.

Concrete work stacks these hazards together. Heavy form panels, rebar cages, pump booms, concrete buckets, ready-mix trucks, and finishing machines all move around workers who are often in tight spaces. Most injuries are hands and fingers caught between form panels, but collapsing forms and backing trucks kill. Today we focus on where you can get caught and how to stay out of the line of fire.

KEY SAFETY POINTS

1. Formwork: Building, Setting, and Stripping

Form panels are heavy, awkward, and often moved by hand or crane, so every step of their life cycle has pinch points.

Pinch points while building and setting forms

- Keep fingers out from between panels, walers, and strongbacks when aligning them. Use a bar, pry, or alignment tool instead of your hands.
- Know the pinch points on wedge bolts, clamps, form ties, snap ties, and pins. Never grab a panel at the joint being closed.
- When panels are crane set, use tag lines. Never stand between a swinging panel and an existing wall, column, or stack of forms.
- Do not put your body between a panel being set and the bracing, scaffold, or excavation wall behind it.
- Stack panels flat or in racks so they can't tip and pin someone. Chock or brace stored panels on edge.
- Use team lifts or mechanical aids for heavy panels, and communicate before every move ("ready, lift, set").

Formwork collapse and shoring (1926.703)

- Formwork must be designed, built, braced, and maintained to carry all vertical and lateral loads during the pour. Keep the drawings or plans on site.

- A competent person inspects forms and shoring before, during, and right after the pour. Damaged shores are never used.
- Stop the pour and clear the area if forms bulge, shift, creak, or leak, or if a tie lets go. Never stand under a deck or beside a wall form during placement unless your task requires it.
- Do not place material stacks or equipment on new concrete until a qualified person confirms it can carry the load (1926.701(a)).

Stripping and flying forms

- Do not strip forms or pull shores until the concrete has reached the strength the plans or field or lab tests require. Early stripping is a leading cause of collapse.
- Plan the drop zone. Panels can release suddenly, swing, or fall. Stay out from under and beside panels being pried loose.
- When flying table forms or gang forms, stay clear of the gap between the form and the slab edge or column, and use tag lines.
- Never ride a form, and never stand between a moving gang form and the structure.

2. Reinforcing Steel

Rebar cages and mats are heavy and unstable until tied in. They can crush workers when they fall or pin hands when they are set.

- Guy or brace rebar for walls, piers, columns, and similar vertical structures to prevent collapse (1926.703(d)).
- Never stand under a suspended rebar cage or bundle, and use tag lines to guide it.
- Keep hands out of the gap between a cage and the form, and between bars being lowered onto chairs or supports.
- When cutting or bending rebar, keep hands clear of the bender's pinch point and use guards on cutters and benders.
- Cap or guard all protruding rebar so a slip or fall doesn't become an impalement (1926.701(b)).

3. Placement and Finishing Equipment

During a pour, trucks, pumps, and buckets move constantly around crews, so set exclusion zones before the first truck arrives.

- **Ready-mix trucks:** Use a spotter for every backing move. Never stand between a backing truck and forms, walls, the pump, or other equipment, and stay clear of the chute as it swings.
- **Pump trucks:** Set outriggers on firm, level ground with pads, and keep everyone out of the outrigger and boom swing area. Never stand between the truck and a structure. Pipe supports must handle 100 percent overload, and compressed air hoses need positive fail-safe joint connectors (1926.702(e)).
- **Pump hose:** Stay clear of the end hose when the pump starts or a blockage clears. It can whip and pin a worker against forms or rebar.
- **Concrete buckets:** No one rides a bucket or works under one while it is raised or lowered. Bucket gates must have positive safety latches (1926.701(d), 1926.702(f)). Keep hands off the gate lever and out of the gap between the bucket and the form.
- **Mixers:** Mixers of 1 cubic yard or more need a mechanical device to clear the skip and guardrails on each side of it (1926.702(b)). Never reach into a drum or skip that can move.

- **Buggies:** Handles must not extend past the wheels, so hands don't get crushed against walls or columns (1926.702(d)).
- **Power trowels:** Must have a dead-man switch that stops the machine when released (1926.702(c)). Keep feet and hands clear of rotating blades and the guard ring.
- **Screeds and vibrators:** Keep hands off rollers, drive belts, and moving parts. Don't wrap vibrator cords or hoses around your body.
- **Lockout/tagout:** Lock out and tag out compressors, mixers, screens, and pumps before maintenance or cleaning where unexpected startup could catch a worker (1926.701(e)). This includes washing out mixer drums and clearing pump hoppers.
- **Bulk cement and aggregate bins:** Never enter unless the ejection system is shut down, locked out, and tagged (1926.702(a)). Material can engulf a worker in seconds.

4. Precast, Tilt-Up, and Post-Tensioning

These members weigh tons and are only stable once braced or permanently connected, so never put your body where a panel or tendon could go.

- Support precast members and tilt-up panels until permanent connections are complete, and never remove braces early (1926.704).
- Stay out of the fall zone of a panel being lifted, set, or braced, and never stand between a panel and another panel, column, or wall.
- Keep hands off rigging and lifting inserts as the load takes tension.
- During post-tensioning, keep everyone not essential to the operation out from behind the jack, and post signs and barriers (1926.701(c)).
- During lift-slab jacking, only essential workers may be under the slab (1926.705).

Verify the current text of the 1926 Subpart Q and Subpart O sections listed above before citing them in a report, notification letter, or client document.

GENERAL CONTROLS FOR ALL CONCRETE AND FORMWORK TASKS

- Hold a pre-pour or pre-task meeting that identifies pinch points, equipment paths, crane picks, and the exclusion zones.
- Before you reach or step in, ask: "If this moves, where do I go?" Keep yourself out of the line of fire.
- Wear gloves suited to the task, steel-toe boots, and high-visibility clothing. Add waterproof gloves and boots for wet concrete. Gloves protect skin but won't stop a crush, so keep hands clear.
- Make sure guards are in place on mixers, saws, benders, and finishing equipment, and never remove them.
- Use one clear signal person for crane and pump moves.
- Report bulging forms, missing ties, damaged shores, unbraced rebar, or missing guards immediately.

DISCUSSION QUESTIONS

1. Where are the worst pinch points on the forms we are using right now?
2. Before our next pour, who inspects the forms and shoring, and what signs would make us stop placement?
3. Where will the pump truck, ready-mix trucks, and bucket be, and where is the exclusion zone?
4. When do we lock out the mixer or pump, and who holds the lock?

KEY TAKEAWAY

In concrete work, the hazards that crush and pin people are predictable: form panel joints, collapsing forms, rebar cages, backing trucks, pump booms, buckets, and rotating equipment. Plan the work, inspect the forms, guard the equipment, and keep your body out of the line of fire.

CLOSING

Stop work if forms bulge or shift, a truck backs without a spotter, a guard is missing, or someone is standing where they could be pinned. Speak up right away. Your attention protects everyone.

Let’s commit to zero caught-in injuries on every pour. Stay alert, follow procedures, and watch out for one another.

Safety Meeting Sign-Off Sheet

Date: _____

Job Name: _____

Competent Person Name: _____

Competent Person Signature: _____

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Attendees:	