

To ensure successful Quad-Lock projects, it is critical that Builders follow recommended practices. Please read the following bulletin carefully – these tips **will** make a difference!



## CONCRETE MIX & PLACEMENT

The concrete mix & placement techniques are critical to ALL aspects of the project, especially form performance and concrete consolidation.

**PROPER CONCRETE CONSOLIDATION IS PARAMOUNT** to prevent voids in the concrete. Pay special attention to the sides of all openings, bulkheads, and any area that has a higher than normal concentration of steel.

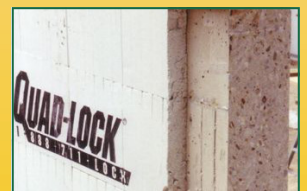
- **Compressive Strength:** Specify the 28-day compressive strength of the concrete with your concrete supplier to meet the designed strength. At a minimum the strength should be 2500 psi (USA) or 20 Mpa (Canada). Slightly higher compressive strengths of 3,000 to 4,000 psi [21-28 Mpa] improve the flowability and pumpability of the concrete and the walls' strength at **minimal additional costs**.



- **Concrete Slump & Admixtures:** The concrete mix needs to be “flowable”—that does not mean “higher slump”. Pour a **maximum 6" slump** (between 5" and 6" preferred) [EU flow diameter: 42cm max]. **Higher slump creates excessive formwork pressure**. Order a 4" slump that is brought to a 5-6" slump at the job site by adding (super-) plasticizing admixtures. For practical purposes, check the first load's slump right before the pour and look into the mixer to see how the concrete “flows” over the mixing blades: it should just barely “break” and almost flow over the blades. Check all subsequent loads for the same consistency before placement. It is okay to send back a truck with an unsuitable concrete mix. **Do NOT add extra water to the concrete:** it will impair the characteristics of the concrete and can increase the slump too much.



- **Aggregate Size:** To ensure consolidation, the maximum size of coarse aggregate should be **3/8"** [10mm] in walls 6" [15cm] and thinner (nominal concrete width). You can use 3/4" [20mm] in walls 8" [20cm] and thicker.



## CONCRETE MIX & PLACEMENT Cont'd

- **Concrete Flow Rate:** Take your time and pour conservatively. A 20 to 30 minute offload of a full load of concrete (about 13 cu. yards [10m<sup>3</sup>]) is normal. Avoid using pumps with a large diameter hose: **use a 3" diameter tremmi-hose** whenever possible. Keep the rate of flow low by slowing down the pump. Keep the impact of the concrete at the bottom of the wall to a minimum. When pouring high walls, either:

  - use a small diameter hose and stick the hose down into the cavity so concrete falls a maximum of 5' [1.5m], or
  - first pour from the side of the wall through ports cut out of the foam (avoid ties) every 6' [1.8m] at about 5' [1.5m] high. The cutouts can then be replaced and secured by screwing 1x4 or plywood across the ports into the ties.
- **Window Openings:** We recommend leaving the window sills as open as possible. **Always pour window sills first—from the sill level.** This will allow the sill areas to begin to set prior to pouring the rest of the wall.
- **Height of Lifts:** **Always** start with a maximum 2-3' lift [60-90cm] at the bottom of the wall. If this is your first pour, stick with 2' [60cm] lifts for the whole job. As you gain experience with ICF pours, subsequent lifts can increase to 3-4' [90-120cm].
- **Consolidation with Vibrator or Hand-Rodding:** Follow proper concrete consolidation techniques: Use either a piece of rebar to hand-rod the concrete inside the cavity during placement or a mechanical vibrator with a small diameter (maximum 1¼" [32mm]). **OVER-VIBRATING will cause problems.** After each lift, lower the vibrator every 12-16" [30-40cm] through the concrete lift into the lift below, then bring it back out right away. The vibrator insertion and retraction should not take more than 4-7 seconds. **Do not vibrate inside the corners.**
- **Hot Weather:** EPS panels get softer in hot weather conditions (more than 80°F / 27°C) and become susceptible to deflection. During hot weather, **pour early in the day or use water to cool down the forms** before concrete placement, .



*For more information, contact your Quad-Lock Sales Representative or the Technical Services Department.*