TECHNICAL BULLETIN # 11

Best Practices to Ensure Complete Filling of Insulated Concrete Form Systems

Insulated Concrete Form (ICF) systems provide thermal mass benefit solutions to meet today's building and energy codes. To ensure continuity in both structural integrity and thermal mass, close attention to every detail on Pour Day is critical.

ICF concrete should be dense, homogenous, and free of cold joints, voids, and honeycombing. It should be well bonded to all reinforcing steel, anchors, and embedded parts, such as bearing plates. In the past, the ICF industry has commonly accepted hand-tamping, rodding, or external vibration as adequate means for concrete consolidation. However, historical experience has shown that these methods are not adequate. Of all available methods, internal mechanical concrete vibration is the most effective method to assure the highest level of monolithic consolidation.

Unless otherwise stated in the project specification, concrete should be designed to a CSA strength and exposure class commensurate with the structural and durability requirements of the application. To properly achieve this, factors such as aggregate size, wall thickness and reinforcement configuration should be considered and reviewed with the concrete supplier when a mix is being selected. Mixes designed for an ICF application including specialized admixtures can facilitate placement but do not eliminate the need for proper consolidation practices.

Some practical tips for proper consolidation of ICF concrete include:

1) Consolidation should start at the base of the wall.
2) A laborer with a vibrator should follow immediately behind the placement hose.
3) Each lift should be consolidated before the next lift is deposited.
4) The vibrator should completely penetrate through the lift and into the upper portion of the previous lift.
5) Therefore, the shaft length of the vibrator must substantially exceed the height of any lift.
6) Concrete consistency and setting characteristics should be designed to allow the placement of 1200 mm (4 ft) lifts at a rate quicker than the time of initial set of the concrete being supplied to facilitate vibrator penetration into the previous lift.
7) Doorways and window bucks should be filled from both sides with the hose at a 45 degree angle away from them.
8) Pours should be terminated at the center of the longest wall when possible and not up against a corner.
9) Additional laborers should be on the ground assisting in mechanical vibration at openings and watching carefully for wall movements or other pressure issues.
10) There should be clear communication between the crew members at all times.

https://buildblock.com/successful-icf-pour/

https://www.nudura.com/media/4519/nudura-concrete-placement-checklists.pdf

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