



Cold Weather Concreting Procedures

This procedure may be used as the basis for the acceptance or rejection of any concrete foundation. Section R402.2 of the 2018 International Residential Code (IRC) references American Concrete Institute (ACI) 318-11 as the standard to follow for concrete. It is the intent of this procedure to closely follow the ACI 318-11, *Building Code Requirements for Structural Concrete*, and the ACI 306R-10, *Guide to Cold Weather Concreting*.

Code requirements 2018 IRC The building code requires that the minimum compressive strength of concrete for footings be 2500 psi, for foundation walls, 3000 psi. The code also specifies that the concrete be air entrained. The total air content (percent by volume of concrete) shall not be less than 5% or greater than 7%.

Cold weather defined The following provisions apply to “cold weather,” defined as “when air temperature has fallen to, or is expected to fall below, 40°F (4°C) during the protection period; protection period is defined as the time recommended to prevent concrete from being adversely affected by exposure to cold weather during construction.”.

Protection during cold weather In “cold weather” conditions it is important to protect the concrete from freezing and to maintain curing conditions to ensure adequate strength development. When “cold weather” conditions exist, surface concrete temperatures must be maintained at 55° F for three days. Curing time may be reduced to two days if the cement content is increased by 100 lbs. per cubic yard or Type III Portland Cement is used, or if an approved accelerator is employed.

Methods of protection

- Polystyrene foam sheets.
- Urethane foam coated with weather resistant enamel
- Insulation blankets
- 6 inches of straw held in place with tarps or polyethylene sheeting.
- After the initial curing period, it is recommended that the concrete be kept dry (protected from the elements) for at least two to three additional days before it is exposed to freezing conditions.

Inspection practices

1. Inspectors shall approve only the foundation elements that are to be poured the same day.
2. The inspectors will be checking to ensure the subgrade is not frozen and whether the proper protection components are on the site at the time of inspection when daily temperatures are below 32° F or forecasted to drop below 32° F within the next 24 to 48 hours. The minimum time period the concrete must be protected against freezing is as follows:
 - When pouring conventional concrete during “cold weather” conditions, the concrete shall be protected from freezing for at least **72 hours (3 days)**.



- When pouring concrete utilizing approved accelerators, Type III Portland Cement, or where the cement ratio is increased 100 lbs. per cubic yard; the concrete shall be protected from freezing for at least **48 hours (two days)**.

*When pouring conventional concrete during “non-cold weather” conditions, protection from freezing shall be maintained for at least **24 hour**

3. If footings were required to be protected from freezing, foundation walls will not be allowed to be poured for at least 48 hours.

Exception: If protection from freezing can be maintained for the period specified above, the wall may be poured after 24 hours has elapsed from the time of the original footing pour. 4. At the inspector’s discretion, concrete drivers’ batch tickets may be reviewed for the purpose of determining the time the concrete truck left the plant, strength of the concrete, percent of air entrainment or any special additive that may have been added to the concrete.

When this procedure mandates protection of footings and walls, the inspector shall give only a partial approval on the initial inspection. Final approval will be given only when it can be established that proper procedures have been taken to protect the concrete from freezing. If the inspector believes the concrete has not been properly protected as described above or per another approved method, the inspector shall require the concrete be tested in order to ensure the proper strength of the concrete has been developed.

The Johnson County Building Officials Association does not warrant the accuracy, completeness, or timeliness of the information contained in this handout. To verify the requirements where you are working, please refer to the official version of the ordinance for the jurisdiction you are performing work in.