



Community Development/Planning Dept.
401 N. Madison St., Spring Hill, KS 66083
(913) 592-3657 • (913) 592-5040 FAX
planning@springhillks.gov • www.springhillks.gov

COLD WEATHER CONCRETE

This procedure may be used as basis for the acceptance or rejection of any concrete foundation. Section 402.2 of the International Residential Code (IRC) references the American Concrete Institute (ACI) 318 as the standard to follow for concrete. It is the intent of this procedure to closely follow the ACI 318, Standard Specification for Cold Weather Concreting.

Code Requirements – 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 content (percent by volume of concrete) shall not be less than 5% or greater than 7%.

Cold weather defined

The provisions that follow apply to “cold weather”, which is defined as a period of three consecutive days when the average temperature is below 40 ° F, and not above 50 ° F for more than half of any one of those three days. A “cold weather” situation is solely based upon previous temperature, and not upon forecasted temperatures.

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

- For footings an acceptable method of protections from freezing during the curing process is to cover footings with 6 inches of straw. The straw shall be held in place with tarps or polyethylene sheeting.
- For foundations walls, insulated blankets may be used.
- After the initial curing period, it is recommended that the concrete be kept dry (protected from the elements) for at least two or three additional days before it is exposed to freezing conditions.



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Inspection practices

1. Requirements for implementation of cold weather concrete requirements will be at the discretion of the inspectors at the time of inspections - inspection requests for concrete inspections will not be restricted. Inspectors shall approve only the foundation elements that are going to be poured that same day.
2. The inspectors will be checking to ensure that the subgrade is not frozen and whether the proper protection components are on 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 for which 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 (three 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 hours.*
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 that the concrete has not been properly protected as described above or per another approved method, the inspector shall require that the concrete be tested in order to ensure that proper strength of the concrete has been developed.