

City of Linn Valley – BUILDING CODES

22412 E. 2400 Rd. Linn Valley, KS, 66040
Building Codes (913)731-1459 - City Hall (913) 757-2926

Cold Weather Concrete Policy

The following provisions shall apply to the pouring of concrete in cold weather conditions.

Code Requirement for Concrete

Section R402.2 of the 2006 International Residential Code (IRC) requires that concrete construction meet the specifications stipulated in the American Concrete Institute's (ACI) standard 318 *Building Code Requirements for Structural Concrete*. Those specifications are:

- Concrete for footings and basement slabs shall have a minimum compressive strength of 2500 psi.
- Concrete for foundation walls shall have a minimum compressive strength of 3000 psi.
- Concrete for exterior, garage, or structural slabs shall have a minimum compressive strength of 3500 psi.
- Concrete shall be air entrained.
- Total air content for concrete (percent by volume of concrete) shall not be less than 5% or greater than 7%.
- Concrete for a garage floor with a steel-troweled finish can have its total air content (percent by volume of concrete) reduced to not less than 3% if the specified compressive strength is increased to not less than 4000 psi.
- Note that all minimum compressive strengths listed above are calculated at 28 days.

For concrete to meet the above specifications it must at a minimum maintain a surface temperature of 55° Fahrenheit for the first 72 hours of the curing process.

Cold Weather Conditions

During cold weather conditions, concrete must be protected from low temperatures for the first 72 hours of the curing process in order to maintain the required minimum surface temperature of 55° Fahrenheit.

Cold weather conditions are in effect and cold weather protection measures are required when the weather forecast for Linn Valley, KS. at weatherbug.com calls for a drop in temperature below freezing, 32° Fahrenheit, for the intended day of the concrete pour or at any point during the 3 day (72 hour) curing period that follows. When this forecast indicates a drop in temperature below 25° Fahrenheit for the intended day of the concrete pour or at any point during the 3 day (72 hour) curing period that follows, then requests for city personnel to inspect concrete will be denied or cancelled, and no concrete shall be poured unless it is done under the supervision of a 3rd party Kansas licensed structural engineer who will be required to provide a sealed report certifying the concrete installation and cold weather protective measures prior to rough-in inspection. Until this engineer's report is received and approved by the Building Codes Official, requests for rough-in inspection will be denied or cancelled.

Engineer Reporting Requirements

If a 3rd party engineer's report is to be submitted for concrete poured during cold weather conditions, the report shall include the following mandatory information:

- Date and time of the inspection.
- Time that the concrete pour was initiated.
- Temperature at time of pour and the forecasted lows for the next 72 hours.
- Description of the soil conditions and soil load bearing assumptive value.

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- Indicate either no frozen subgrade was observed or frozen material was removed prior to pour. Under no circumstances will concrete be allowed to be poured on frozen subgrade.
- Indicate that the reinforcement and layout of the inspected item matches the city approved plans.
- Type of concrete being used and slump mixture.
- Specify what cold weather protection measures were taken for the concrete.

Cold Weather Protection Measures

The following are acceptable protection measures for concrete during cold weather conditions:

- Footings or slabs may be covered with insulated blankets or with 6 inches of straw secured in place with tarps or polyethylene sheeting.
- Foundation walls may be covered with insulated blankets.
- Hydronic heating pipes or electric heating blankets in combination with insulated blankets may be utilized.
- A temporary structure encapsulating the concrete construction and supplied by a powered heat source may be installed, but prior approval from the City Building Official must be obtained.

If the permit holder desires to utilize an alternate cold weather protection measure rather than one of those mentioned above, that proposed measure must be sealed by a Kansas licensed structural engineer, submitted for review, and gain approval from the Building Codes Official in advance of the pour.

Additional Considerations

- If the footings required cold weather protection measures, then a minimum of 48 hours must elapse before the foundation walls can be poured upon those footings.
- The curing time and thus the time required for cold weather measures may be reduced from 72 hours to 48 hours 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.
- It is recommended that after the initial curing period the concrete should be kept dry (protected from the elements) for at least two to three additional days before it is exposed to freezing conditions.

If Policy Is Not Followed

If concrete is poured during cold weather conditions and is not protected by an approved measure as described above in this policy, prior to rough-in inspection the Building Codes Official will require from the permit holder a sealed report from a certified 3rd party testing agency testifying that the concrete in question has been tested and verified to meet the specifications dictated by ACI 318, ACI 332, and the building code.