

BUILDING SAFETY PROFESSIONALS OF SOUTHWESTERN IDAHO

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COLLABORATIVE INTERPRETATION AND/OR DETERMINATION OF THE PROVISIONS OF THE STATE MANDATED BUILDING CODES

July, 2013

Adopted International Residential Code (IRC) & Adopted International Building Code (IBC) American Concrete Institute (ACI)

General Topic: Cold Weather Concrete Placement.

Consigning Jurisdictions: Canyon County, City of Nampa, City of Caldwell, Owyhee County, City of Meridian, City of Star, City of Middleton, City of Fruitland, Payette County, Valley County, City of Melba, Owyhee County, City of Boise, City of McCall, City of Eagle

Cold Weather Concrete Placement Defined: The provisions that follow apply to “cold weather” which is defined as a period of three consecutive days when the average daily temperature is below 40° F, during the protection period and not above 50° F for more than half of any one of those three days. The average daily air temperature is the average of the highest and the lowest temperatures occurring during the period from midnight to midnight. A “cold weather” situation is solely based upon actual on-site temperatures, and not upon forecasted temperatures.

Protection During Cold Weather: In cold weather it is important to protect newly placed concrete from freezing and to maintain curing conditions to ensure adequate strength development. Concrete that does not attain acceptable strength must be removed. It has been shown through data analysis that if concrete freezes, it does not continue to gain strength in a manner consistent with normal concrete performance. The IRC and IBC reference the ACI 318 Standard which references the ACI 306 Standard, Guide to Cold Weather Concreting. Practices noted below are intended to align with these Standards.

Construction Practices: Follow provisions of the ACI Standards or the summary of practices noted below.

- The temperature of any forms, steel, and sub-grade must be a min. of 35° F at the time of concrete placement.
- The sub-grade may be thawed by the use of a thermal blanket or an external heat source. The sub-grade may have to be re-compacted after complete thawing.
- All snow and ice must be removed so that it does not occupy space intended to be filled with concrete. Hot air may be used for this purpose.
- Concrete placements must be protected with insulating materials immediately upon placement completion and surface temperature of concrete must be maintained at a min. of 50° F for a min. of 3 days (72 hours) during cold weather. Commonly used insulating materials include polystyrene foam sheets, urethane foam, foamed vinyl blankets, mineral wool or cellulose fibers, straw, and insulated blankets or batt insulation. Use of double R-5.1 insulating blankets is a common method of protection in temperatures from 20° F to 40° F.
- If average daily temperature falls below 20° F; concrete must be heated continuously for 3 days (72 hours) by utilizing methods such as heated enclosures with an approved type of heat source. Fuel fired heaters shall be adequately vented to the exterior.
- When placing high early strength concrete or utilizing approved accelerators, Type III Portland cement, or where the cement ratio is increased to 600 lbs. per yard or at a 4,000 psi mix, the concrete shall be protected from freezing at a temperature of 50° F for at least 2 days (48 hours).
- If footings were required to be protected from freezing, foundation walls will not be allowed to be placed for at least 2 days (48 hours). Exception: If protection from freezing (of the footings or the system) can be maintained for a period specified above the wall may be placed after 24 hours has elapsed from the time of original footing pour completion.

Inspection Process:

- **Inspectors will only approve concrete placement for the same day as the inspection.**
- **Inspectors will be checking for frozen ground & whether appropriate protection blankets or other materials are on site.**
- **Concrete batch tickets may be required to determine departure time, concrete strength, & additives.**
- **If the inspector believes the concrete has not been properly protected they may require additional testing and engineering.**
- **Check www.weather.com for consistent weather and temperature information.**