

Laying in Cold Weather

When concrete sets it is the result of the cement having a **chemical reaction** with **water**. Very cold temperatures **slow down** this reaction, and so set times are slower. Keeping the temperature of the concrete **as high as possible** is therefore the goal.

Precautions

Precautions which may be taken to protect the concrete in cold weather may consist of one or more of the following practices:

- ▶ Avoid very cold mornings, so pour later in the day when everything has warmed up.
- ▶ Use (chloride-free) accelerating admixture and or higher cement contents.
- ▶ Providing heaters, insulating materials, and enclosures if sub-zero temperatures are expected.
- ▶ Do not placing concrete on frozen ground.
- ▶ Ensuring means of maintaining suitable curing temperatures - the temperature of the concrete should be maintained at 20°C or above for 3 days.
- ▶ Insulating the concrete with a thick insulating blanket.

Checklist:

- ✓ Avoid sub zero times.
- ✓ Use higher cement (strengths) mixes.
- ✓ Insulate.



Laying in Hot Weather

The effects of high temperatures can be summarised as follows:

- ▶ Short set times and faster stiffening and setting.
- ▶ Faster rates of hardening.
- ▶ Increased tendency for plastic cracks (cracks that form when the concrete has not set).
- ▶ Difficulties in placing and finishing due to all the above.
- ▶ Danger of cold joints - (a cold joint is formed when plastic concrete is placed against concrete that has set and commenced hardening).



A good day for drying your washing, is a very risky day for concrete.

At higher temperatures, particularly if accompanied by hot dry winds, plastic cracking and premature stiffening of the concrete may take place. Minimising water loss from the concrete is the key principle to manage.

Precautions for hot-weather concreting should be initiated when the ambient temperature is expected to exceed 30 to 35°C or lower if it is a windy day as well.

These precautions may consist of one or more of the following practices:

- ▶ Plan the pour early in the morning to avoid time of very high evaporation.
- ▶ Dampening forms, reinforcement and subbase, or using Polythene below to stop water loss through base.
- ▶ Erecting wind breaks and sunshades to protect exposed concrete surfaces.
- ▶ Completing the transporting, placing and finishing of concrete as rapidly as is practicable.
- ▶ Informed usage of set-retarding admixtures (to counter premature stiffening of the fresh mix).
- ▶ Immediately following the initial finishing operation, apply Antivap by Sika (a fine film of aliphatic alcohol to reduce evaporation) over the exposed concrete (this should be repeated as necessary during any subsequent operations up to final finishing).
- ▶ Immediate curing after final finishing is complete.

Checklist:

- ✓ Avoid times of heat and wind.
- ✓ Take precautions.
- ✓ Use Anti-vap.
- ✓ Cure early.