CONCRETE IN HOT WEATHER GUIDELINES

When concrete is mixed, transported, and place under hot weather conditions such as high ambient temperature, low humidity, solar radiation, or strong wind, it is important to know what effects these environmental factors can have on the fresh and hardened concrete properties and what precautionary measure are required in the construction operations to prevent damage occurring to the concrete.

Definition of Hot Weather

- High ambient temperature
- Solar radiation
- Low relative humidity
- Wind velocity
- High concrete temperature

Hot weather is any combination of the above which impair the quality of the fresh or hardened concrete and/or cause detrimental results.

Hot weather concrete problems generally occur during the summer season

Thermal shrinkage is more severe in the spring and autumn (temperature differential)

When air temperatures are identical, a calm, humid day is less severe than a dry, windy, sunny day.

Potential Problems in Hot Weather - Fresh Concrete

- Increased water demand
- Increased loss of workability with the tendency to add water at the job site
- Increased rate of setting and hardening, resulting in difficult handling and finishing with a risk of cold joints
- Increased potential for plastic shrinkage cracking
- Difficulty in controlling entrained air content.

Potential Problems in Hot Weather - Hardened Concrete

- Potential decrease in 28 day and later age strengths
- Increase in drying shrinkage and thermal cracking
- Increase in permeability
- Reduction in durability
- Difficulty in controlling entrained air content.

Avoiding Potential Problems

- Protect concrete against moisture loss during placement and particularly curing period
- Always cure concrete immediately and fully
- Order the correct concrete mix at adequate workability for the job in hand
- Dampen sub-grade before concreting begins
- Plan the work to avoid peak temperatures