

Miscellaneous Concrete Information

Mixing

- 70 – 100 revolutions at mixing speed is essential
- 30 additional revolutions are required if water is added at the job site
- Cautions for adding water at the job site
 - It will reduce the durability and strength of the concrete
 - It will increase setting times at moderate temperatures
 - It will increase the cracking potential of the concrete due to shrinkage

Hot Weather Placement

- A 20°F increase in concrete temperature can reduce setting times by two hours or more
- A 20°F increase in concrete temperature can reduce the slump 1 – 1 ½ inches
- As a general rule, a 1.5°F increase in aggregate temperature will increase concrete temperature about 1°F.
- As a general rule, a 10°F increase in cement temperature will increase concrete temperature about 1°F.

Cold Weather Placement

- A 10°F decrease in concrete temperature can increase setting times by 33%.
- Two gallons of additional water per cubic yard can increase setting times by up to one hour.
- As a general rule, a 5°F increase in water temperature will increase concrete temperature about 1°F.

Curing

- Proper concrete curing and the use of air entrainment are critical factors in producing durable concrete that will withstand freeze-thaw cycles.
- Proper concrete curing can reduce the concrete's permeability, reduce shrinkage cracking, reduce surface scaling, increase surface abrasion resistance, and promote uniform surface color.
- Proper curing methods:
 - Water curing through flooding or continuous mist spray.
 - Water retaining covers such as sand, straw, canvas, or burlap that are kept continuously wet.
 - Waterproof paper or plastic applied as soon as the concrete can resist surface damage.
 - Chemical curing compounds applied as soon as the concrete is finished.

Test Cylinders

- A strength loss of up to 61% can be expected for insufficient consolidation.
- A strength loss of up to 26% can be expected for test cylinders left in the field and exposed to warm temperatures for 7 days.

De-Icing Concrete

- Never use de-icers containing ammonium sulfate or ammonium nitrate (e.g. fertilizers). These products are known to aggressively attack concrete.
- De-icing chemicals (e.g. calcium chloride beads) can cause concrete surface scaling.
- Rock Salt does not chemically attack concrete, but it does increase the number of freeze-thaw cycles. Increasing the number of cycles can cause damage from freeze-induced expansive pressures.
- Sand, used for traction, is the safest way to protect the concrete surface.