

# RUSSTECHNICAL NOTES

## DURABLE CONCRETE

### OVERVIEW:

It is relatively easy to produce concrete which will give trouble-free service for many years. There are five requirements, equally important, that need to be followed to produce durable, long lasting concrete.

### SUBGRADE PREPARATION:

The subgrade must be compacted uniformly. Slope the subgrade. Tops of outdoor slabs, such as patios, driveways and parking areas, should slope at least 1/8" per foot. A "flat" slab will usually collect water and cause complaints. Spray the subgrade so that it is moist but not muddy at time of concrete placement.

### QUALITY CONCRETE:

Use a quality concrete supplier and a quality concrete mix. Exterior concrete exposed to de-icing salts such as driveways should be 4000 psi *minimum in place compressive strength*. **Do not increase slump with added water** as compressive strength will decrease approximately 200 psi for each gallon of water added per yard of concrete. Added water will increase cracking and change the air content. It can also wash out the air leaving concrete vulnerable to freeze-thaw attack.

### Recommended Air Contents for Concrete

Entrained air (exterior).....	6% ± 1%
Entrained air (interior).....	1% - 3%
Slump .....	4" ± 1"

**\*\* For placement at slumps of 5" to 8" incorporate RUSSTECH mid-range or high-range water reducing admixtures into the mix design to eliminate adding extra water.**

### PLACING & FINISHING:

Place the concrete, then screed to proper elevation. Bullfloat the surface before bleed water accumulates on the surface. Finishing must be delayed until water sheen has disappeared from the surface. The least amount of finishing should then be done; don't add water to the surface or overwork the surface. Trowelling can be the final finish or the concrete



can be broom finished. Brooming must await stiffening of the surface sufficiently to prevent accumulation of mortar by the damp broom moving across the surface. In hot weather fresh concrete should be protected from the sun and wind even before it is finished. Use **EVRT**, evaporation retardant on windy, low humidity days to help prevent plastic shrinkage cracks.

### PROPER DESIGN:

For patios and driveways, non-reinforced pavement 4" thick is satisfactory. Control joints should be 8' to 10' apart each way. They should be at least 1" deep and should be made by sawing or tooling. Sawed joints must be cut as soon as possible without raveling the concrete. Isolation joints should be used at garage doors, where driveway abuts sidewalk, street, and where the patio abuts the house. Isolation joints should extend completely through the slab providing total separation between new and old slabs. Fiber reinforcement is a good choice to reduce drying shrinkage cracks

### CONCRETE CURING:

Sufficient curing greatly increases the durability of concrete. Concrete should be cured with **CURE & SEAL 250, CURE & SEAL 300, CRETESEAL 30, or STAMPSEAL 30** curing compound applied on the surface immediately after final finishing. In the fall and winter, use insulating blankets. Leave blankets on for 3 days and remove to let slab dry.



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