Concrete Jointing

"Concrete cracks. The trick is to get it to crack where you want it to."

Joint Types:

Contraction Joints – Tooled in or saw cut into slab.

Construction Joints – Area where two successive placements of concrete meet.

Isolation Joints – Used to effectively isolate a section or area of the slab from other areas of the slab.

Joints are designed and implemented into the project as much as the concrete mix is. Properly designed and implemented joints can add years to the service life of the slab.

Concrete Tips

Concrete Setting / Stiffening

The chemical process by which concrete hardens and gains strength is called hydration. Hydration time can be altered by as much as 30% for each 10°F change in ambient temperature

Typical concrete placed at 70°F (concrete temperature and ambient temperature) achieves final set in about 6 hours. Concrete and ambient temperatures will affect the setting of the concrete as show below:

Temperature (°F)	Approximate Final Set (hours)
30	19 +
40	14:40
50	10:20
60	8
70	6
80	4
90	2:40
100	1:40

Concrete Tips

Adding Water

"Water is the best / worst thing you can add to your concrete."

Adding one gallon of water to one cubic yard of a typical 3000 psi concrete can:

- Increase the slump by about one inch
- Reduce the compressive strength by about 250 psi
- Increase the possibility of passage of moisture throughout the concrete by up to 50%
- Increase the shrinkage potential by about 10%

Properties also affected water addition:

Lessened wear resistance
Increased dusting potential
Increased cracking potential
Reduced durability

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CONCRETE TIPS

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*The **One Source** for Perfecting Your Concrete ... Inside and Out*

Vibration is more about Quality than it is about Quantity

- Over-vibration can cause honeycombing rather than eliminating it.
- Under vibrating concrete can cause honeycombing in low slump concrete.
- High slump concrete (7-9 inches) requires very little vibration. 'Wet' Concrete and SCC (9 inches and higher) usually requires no vibration.
- Over vibration can cause the concrete to lose entrained air, sometimes as much as one half of the air content.
- When placing concrete in lifts, be sure to penetrate previous layer with vibrator in order to protect against cold joints.
- Use as much vertical angle as possible to maximize effect.
- Using the vibrator as a placement tool instead of a consolidation tool can result in sand streaks and an inconsistent surface.

Concrete Tips

Jointing Guidelines

Code Requirements for Residential Concrete (ACI 332) specifying maximum contraction spacing for slabs on grade without steel.

Slab Thickness (in)	Maximum Aggregate Size less than 3/4 in	Maximum Aggregate Size 3/4 in and larger
3.5	8 ft	10 ft
4.5	10 ft	13 ft
5.5	12 ft	15 ft

- Saw-cutting should be performed before the concrete starts to cool and as soon as the concrete surface is firm enough not to be torn or damaged by the blade. If sawing is delayed, the concrete can crack randomly before it is cut.
- Saw-cutting performed too early in the slab curing process can result in pulling out of the aggregate.
- Saw cut depths should be a minimum of 1 in and preferably 1/4 to 1/3 of the slab depth where practical.

Concrete Tips

Proper curing can make or break the job

Why Cure?
Improper curing can reduce the designed concrete strength as much as 50%.

A properly cured concrete will have fewer pores in the surface where water can enter and freeze (and crack / scale).

Cured concrete will, in general, crack less, have reduced or no dusting, be more durable and achieve increased wear and abrasion resistance.

Curing Methods

- Membrane curing compounds
- Moist / water cure (concrete is kept wet)
- Water-proof curing paper or sheets
- Soaked burlap
- Plastic sheets
- Damp soil, straw and hay
- 7 Day ponding

When placing concrete in temperatures colder than 70°F, curing times should be increased to protect concrete longer as strength develops more slowly at colder temperatures.

Concrete Tips

Concrete volume

One cubic yard of concrete (27 ft^3) will cover:

Concrete Thickness (in)	Coverage Area (ft^2)
4	81
5	64.8
6	54
7	46
8	40.5
9	36
10	32.4
11	29.5
12	27

Euclid Concrete Admixtures

For information on chemical admixtures, concrete sealers, curing compounds and construction products, please call 1-800-321-7628 or visit www.euclidchemical.com