



Do It Yourself Concrete

Concrete applications for driveways, carports, walks, patios and garage floors

Planning

Slab Thickness: 3½ to 4 inches is common for residential use.

Your Concrete Base: Sand or other granular material assists in providing uniformity and drainage. Never use cinders under a slab

Concrete Drainage: Always slope outside slabs for positive drainage. Make sure no water runs toward your house, unless you use special drains to intercept the flow. The surface of the base should generally parallel the final slab slope. The minimum slope for the slab should be an 1/8 inch drop per foot.

Concrete Preparation

Excavating: Remove all organic matter - grass, leaves, tree roots, wood, etc.

Compaction: Compact your sub grade uniformly and evenly to keep your slab from settling or varying in thickness.

Forms: Stake securely. Scrape base away from forms so the edges are at least full thickness. If edges are thinner, cracks may develop due to the differential in thickness.

Make it Easy: If you decide on a 3½ inch pavement, you can form it with 2x4 lumber.

Isolation: Before your concrete is delivered, install pre-molded joint material wherever flatwork comes against buildings, steps, walls, existing slabs, etc. to keep new concrete from bonding to your structures.

Remember: Joint material must extend through the full depth of the concrete slab.

Moistening: Shortly before placing the concrete, wet your concrete forms and the sub grade. Don't over wet, though. You want *moist*, not mud!

Never Place a Concrete Slab on Frozen Soil or Base Material!

Specifications For Concrete

Strength: Always use a high quality mix. You'll need a minimum 4000-PSI performance mix for concrete subjected to freeze/thaw conditions.

- Consider the added value of prescription concrete mixes, which are specially designed to provide added insurance against scaling and other objectionable defects.
- Water reducers or set retarders in hot weather and accelerators in cold weather.
- Discuss other adaptations for your particular application and circumstances with your concrete contractor or a representative from Kuert Concrete.

Slump and Water Content: For hand finishing, you probably need a 5 to 6 inch slump. However, a controlled water-cement ratio is more important than slump. You can use water reducers and cementitious materials to maintain a water-to-cementitious content of 0.5 or less in all cases. For outside concrete slabs, we recommend a *maximum* water-to-cementitious content of 0.45.

Air: Total amount of entrained air for outside concrete slabs should be 5% to 8%. Concrete slabs that will never be subjected to free/thaw conditions may be constructed with either air entrained or non-air entrained.

Placing

Tests: Standard tests generally are not made at the job site on residential work. However, for concrete slabs that will be subjected to free/thaw conditions, we recommend that you have someone (from either the plant or the job site) check the air content to provide reasonable control of this important property.

Addition of Water: To prevent unworkable concrete, don't add water at the jobsite unless it's absolutely necessary. Water additions dilute the cement content, altering air content as well as reducing durability and strength. If you do add water to the truck at the job site, record the addition on the trip ticket and before discharge, remix the concrete approximately 30 revolutions of the truck mixer.

Filling the Forms: Chute, wheel, or shovel concrete directly into its final position. Don't dump it in piles and then flow, drag or rake it the rest of the way.

Leveling: Screed (strike off) twice to level the surface. Immediately use wood or a magnesium bull float to take out small high and low spots. Then, stop everything on that portion of the slab until bleed water (water sheen) disappears from the surface.

Finishing

When to Finish: Immediately after all the bleed water is gone is the proper time to (1) broom **or** float surface **once:** (2) if hand tooled, cut control joints while concrete is still plastic and (3) edge.

Final Finish: We recommend a broom finish for concrete applications such as driveways and sidewalks. When you need a smooth finish (garage floors, patios, etc.), use a wood *hand* float finish. Avoid machine floating and/or trowelling.

Joints: Hand tool, saw, or use inserts to create control joints. When grooved or sawed, cut the joints to a depth of at least $\frac{1}{4}$ the thickness of the concrete slab. Space control joints so that the dimension in either direction does not exceed spacing as indicated below:

Thickness of Slab	Longest Space Between Joints
3½ inch	8 feet
4 inch	10 feet
5 inch or more	12 feet

In addition to lateral jointing, a joint must be cut down the center for the full length of a driveway that is 12' wide and 3½ inches thick or for one that is 16' wide and 6" thick. Although local ordinances govern, joints are commonly spaced at 5-foot intervals in public sidewalks. Joints must be straight and continuous, not staggered or offset. To saw control joints, wait until all other finishing and curing applications are complete and the concrete has hardened sufficiently to permit sawing without raveling.

Curing Concrete

Importance of Curing Concrete: *Curing is one of the most important steps in quality concrete construction and one of the most neglected.* Effective curing is essential for surface durability. With no curing, a 4000-PSI mix becomes a 2000-PSI mix at the surface.

Fresh concrete must be kept warm and moist until the mixing water combines chemically with the cement (hydration). Without curing, the strength of the concrete (where it is needed the most) is basically reduced in half.

When to Cure: Apply curing as soon after brooming and edging as it can be done without eroding the surface.

Curing in Warm Weather: Concrete can be cured in a number of ways, but the simplest, most economical and widely used method is a liquid membrane sprayed on the surface of a concrete slab as soon as possible after finishing. Apply this curing compound at a rate no thinner than manufacturer's recommendations. For example, the manufacturer may specify coverage of not more than 200 square feet per gallon, a rate that is twice as thick as most house paint applications.

Curing in Cold Weather: It is essential to keep fresh concrete from freezing after placing, usually, for at least one week. To assist in curing and protection from freezing, either cover slabs with insulated blankets or use straw, covered with a plastic sheet.

Drying: Newly placed outdoor concrete not only needs time to cure, but it also needs time to dry in warm air. Concrete placed early enough in the season so that it has one month of temperature above 40 degrees (F) for curing and still another month for drying out before hard freezes are expected (certainly before deicers are applied) has a decided advantage over concrete that has not dried out when cold weather begins.

Tips to Owners

First Winter: During the first winter, never use salt (or other deicers). During the first winter, you should only use sand, especially if your concrete is placed after September 15 and not sealed with a penetrating sealer.

Concrete Sealers: Water repellent coatings and sealers keep water from getting into the surface pores and help prevent damage from freeze/thaw cycles and salting. However, some may cause darkening of the concrete. Most sealer applications are effective for about a two-year period.

Fertilizers: Certain lawn fertilizers chemically attack concrete. Take special care to keep them from contact with your concrete. Sweep pelletized fertilizers from concrete slabs before they dissolve. Never substitute fertilizer for a deicer!

Do you still have questions? Contact Kuert Concrete to get solid answers to your D.I.Y. concrete questions!

More Information

Insulating Concrete Forms & Tilt-UP Concrete

The latest information on the highly efficient and practical method of construction.

<http://www.concretebuildings.org/>

Flowable Fill The Versatile

"liquid soil" which is placed as a flowable liquid, yet hardens and rapidly develops excellent load-bearing properties with no compaction necessary. <http://www.flowablefill.org/>

Concrete in Practice Technical Topic Sheets

For information on How, Why and What happens with concrete.

<http://www.nrmca.org/aboutconcrete/cips/default.asp>

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