

CONCRETE CORNER

RESIDENTIAL CONCRETE GUIDELINES FOR BUILDING DURABLE DRIVEWAYS & PATIOS

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How Can I Extend the Life of My Driveway?

- Wait at least 7 days to drive on your new driveway
- Protect it from drain water that can undermine the slab and cause settlement cracks
- First winter, keep salts and other deicers off the pavement.
- Never use deicers that contain either ammonium sulphate or ammonium nitrate.
- Seal the driveway to reduce damage from freeze/thaw cycles. Newly cured concrete should have a period of air-drying before being sealed. Review manufacturer's recommendation on how often to reseal.
- Keep heavy trucks off the driveway especially while the home is under construction.

Planning

- Thickness: 4 inches is generally adequate, unless heavy trucks park on it regularly.
- Base: A firm, sound subsoil is adequate as a base as long as it is uniform and properly drained. If granular base is used, it must be uniform and compacted.
- Reinforcement: If compaction is done correctly, wire mesh is not necessary in residential slabs-on-grade where proper joint spacing and subgrade procedures are followed. Rebar and/or fiber reinforcement has become more common place.
- Drainage: The surface of the finished slab should, slope a minimum of 1/8 inch per foot. A slope of 1/4 inch per foot is preferred.



Preparation

- Excavating: No organic matter-sludge, leaves, tree roots, wood, etc... Don't dig deeper than you need to.
- Compaction: Subsoil on which concrete is to be placed must be compacted

uniformly and evenly so the slab won't settle and won't vary in thickness.

- Forms: Stake securely. Scrape base away from forms so edges will be at least full thickness because, if edges are thinner, cracks could start at the edge and slowly work their way across the whole slab.



- Isolation Joints: Before concrete is delivered, install pre-molded joint material wherever flatwork comes against buildings, steps, wall, existing slabs, etc... This prevents the concrete from bonding to structures. Joint material must extend all the way to the bottom of the slab. Expansion joints are generally not needed.
- Moistening: Before placing concrete, wet the forms and the subgrade. Do not make the subgrade so wet that it's muddy. Placement of the vapor barrier should adhere to local code requirements.

Placing

- Adding water can be done at the job site for very specific reasons. However, it is

discouraged unless necessary to reach the appropriate slump. Adding water dilutes the mixture to less than its desired strength.

- Timing: The concrete should be placed within 90 minutes from the time the truck was loaded. In hot weather the purchaser should shorten the time limit to 60 minutes to maintain durable concrete. Prolonged mixing time or waiting time on the job can result in a loss of air content and /or slump.
- Filling in Forms: Chute, wheel or shovel concrete directly to 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, and immediately bullfloat high and low spots. Then stop everything on that portion of the slab until bleed water disappears from the surface.
- Finishing: Operations should not be performed with excess moisture or bleed water on the surface. Do not add water or cement to the concrete surface.



Other Sources of information:

National Ready Mixed Concrete Association (NRMCA)
www.nrmca.org

Portland Cement Association (PCA)
www.portcement.org

American Society of Concrete Contractors (ASCC)
www.asconc.org

Decorative Concrete Council (DC)
www.decorativeconcretecouncil.org

American Concrete Institute (ACI) (248) 848-3700
www.aci-int.org

American Society for Testing Materials (ASTM) (610) 832-9585
www.astm.org



The Concrete Promotional Group

10707 Barkley, Suite A
Overland Park, KS 66211

Phone: 913-341-5800
Fax: 913-381-4958

We're on the Web
www.concretepromotion.com

Dedicated to Quality Concrete

Finishing Exterior Concrete

- Steel Troweling: Not recommended to finish residential exterior concrete
- When to Finish: Immediately after all bleed water is gone is the proper time 1) to broom or float surface 2) if hand tooled, to cut control joints while concrete is still plastic and 3) to edge.
- Final Finish: A broom finish is recommended, particularly on driveways, walks, etc...Where a smooth finish is desired (garage floors, patios, etc...) a hand float finish should be used. Machine floating and/or troweling is not recommended for residential concrete.
- Joints: Control joints may be hand tooled or sawed. In either method,

they must be cut to a depth of at least 1/3 the thickness of the slab and spaced so that the dimension in either direction does not exceed that shown in the following table:

Thickness of Slab:	Longest Space Between Joints:
4 inches	8 feet
5 in. or more	10 feet

This means, in addition to



transverse jointing, a joint must be cut down the center for the full length of a driveway that is 12 feet wide and 4 inches thick, or for one that is 16 feet wide and 6 inches thick. Joints usually are at much shorter intervals in public sidewalks. Most common spacing is 5 feet. Local codes or ordinances govern. Joints must be straight and continuous, not staggered or offset. Control joints are not usually sealed.

- Caution: Do not overwork or over finish the surface of any exposed concrete slab. Not only is it time consuming and expensive, it also tends to bring too much fine material to the surface and weaken it. Never use a steel trowel on concrete exposed to weather. These practices could result in spalling or scaling.

Curing Exterior Concrete

- Need for curing: One of the most important steps in concrete construction and, regrettably, one of the most neglected. **Effective curing is absolutely essential for surface durability.** Fresh concrete must be kept warm and moist until the

mixing water combines chemically with the cement (hydration). Without proper curing the 4000 psi concrete may not reach it's required strength.

- Warm Weather: An evaporation retarder can help protect the concrete

in hot/windy weather.

- Cold Weather: The Concrete MUST be kept from freezing until 75% of the desired strength is attained. A good practice is to use a thick layer of straw with plastic (preferably black to retain the heat) over that.

SPECIFICATIONS FOR EXTERIOR RESIDENTIAL CONCRETE

- Strength: In our part of the country, with frequent freeze/thaw cycles a 4000 to 4500 psi concrete (28 days) is suggested.
- Air: Air entraining admixtures are necessary for attaining 6% to 8% air content.
- Cement: 564 lbs. of cementitious material is suggested, maintaining a maximum .45 w/c ratio.
- Slump: Should be 4 inches, +/- 1 inch. The slump should not exceed 5 inches for durable concrete. Anything more than 6 inches is too wet to use. A slump greater than 4 inches will prolong the time to finish, particularly in cool weather.
- Aggregates: Use clean, sound aggregates.