



## CONCRETE IN PRACTICE

**CIP  
14**

# *What, Why & How?* **Finishing Concrete Flatwork**

### **WHAT** is Finishing?

Finishing is the operation of consolidating, leveling, and creating a concrete surface of a desired texture and hardness. The finish can be strictly functional or decorative.

### **WHY** Finish Concrete?

Finishing makes concrete attractive and serviceable. The final texture, hardness, and joint pattern on slabs, floors, sidewalks, patios, and driveways depends on the concrete's end use. Warehouse or industrial floors usually need to be level and smooth, while other interior floors that are covered with carpet do not have to be as exact. Exterior slabs must be sloped to carry away water and must provide a texture which will not be slippery when wet.

### **HOW** to Finish Concrete

The finishing operation should be carefully planned. Skill, knowledge and experience are required to deal with a variety of concrete mix-



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tures and field conditions. Having the proper manpower and equipment available, and timing the operations properly for existing conditions, is critical. A slope of  $\frac{1}{8}$  in. per foot is necessary to avoid low spots and to drain water away from buildings.

Delays after the concrete arrives create problems in finishing and can reduce final quality. Complete the excavation, compaction, form work and placement of mesh and rebars ahead of time.

Guidelines for placing and consolidating concrete are:

- a. A successful job depends on selecting the correct concrete mix for the job. Consult your Ready Mixed Concrete Producer.
- b. If possible place concrete directly from the truck chute or use wheelbarrows, buggies or pumps to avoid excessively wet, high slump concrete. Start at the far end and work to the near end. On a slope use stiffer concrete and work up the slope.
- c. Spread the concrete using a short-handled, square-ended shovel, a concrete rake, or a come-along. Do not use a garden rake since it will cause segregation.
- d. Tamp the concrete with a spade or 2 by 4 along the edges of the forms to release air voids and consolidate the concrete.
- e. Use a lumber or metal straightedge (called a screed) to strike off the concrete and level it. Rest the screed on edge on the top of the forms, tilt it forward and draw it across the concrete with a sawing motion. Keep a little concrete in front of the screed to fill in any low spots. (Do not use a jitterbug or vibrating screed to work up an excessive layer of mortar on the surface.)

#### Follow These Rules to Finish Concrete

1. **FLOAT** the concrete as soon as it has been struck-off. A float is a wood or metal tool used to further level the concrete surface and to embed the large aggregate. On small jobs a float is hand-held; on larger jobs a long-handled bull float may be used. One or two passes should be enough to smooth and level the surface without sealing the concrete. Floating must end before visible bleed water rises to the surface.
2. **WAIT** for the concrete to stop "bleeding". Bleeding occurs as the solids in the concrete settle. All other finishing operations **MUST WAIT** until the concrete has stopped bleeding and the water sheen has left the surface. Any finishing operations done while the concrete is still bleeding **WILL RESULT** in later problems such as dusting, scaling, crazing and blisters. The waiting period depends on: the amounts of water, cement and chemical admixtures in the concrete; and the weather.<sup>1</sup>
3. **EDGE** the concrete all the way around. Spade the concrete next to the form gently with a small mason's trowel and then use the edging tool to give the concrete rounded edges.

4. **JOINT** the concrete by grooving it. The jointer should have a blade one-fourth the depth of the slab (1 in. deep joints on a 4 in. slab). Use a straight piece of lumber as a guide. A shallow-bit groover should only be used for decorative grooves. See CIP 6 for joint spacing.<sup>1</sup>
5. **TROWEL** the concrete according to its end use. For sidewalks, patios and driveways, troweling may not be required. Repeated passes with a steel trowel will produce a smooth floor that will be slippery when wet. For a smooth floor make successive passes with a smaller steel trowel and increased pressure. Excessive troweling may create dark "trowel burns." Tilting the trowel will cause an undesirable "chatter" texture.
6. **TEXTURE** the concrete surface after floating (for sidewalks, patios or driveways) or after troweling (for interior flatwork) with a coarse or fine push-broom to give a non-slip surface. For information about architectural surface finishes such as exposed aggregate, dry shake color, integral color, and stamped or patterned concrete see Reference No. 2.
7. **NEVER** sprinkle water or cement on concrete while finishing it. This may cause dusting or scaling.<sup>1</sup>
8. **CURE** the concrete as soon as all finishing is completed and the water sheen has left the surface. See CIP-11.

#### References

1. "Concrete in Practice (CIP) Series. Available from: National Ready Mixed Concrete Association, 900 Spring Street, Silver Spring, Maryland 20910.
2. "Cement Mason's Guide." Publication No. PA 122.02H, Portland Cement Association, 5420 Old Orchard Road, Skokie, Illinois 60077.
3. "Residential Concrete," National Association of Home Builders, 15th & "M" Sts., N.W., Washington, D.C. 20005.
4. "Concrete Craftsman Series—Slabs on Grade," American Concrete Institute, P.O.Box 19150 Redford Station, Detroit, Michigan 48219.
5. ACI 302, "Guide for Concrete Floor and Slab Construction," ACI Manual of Concrete Practice, Part 2, American Concrete Institute.
6. "Finishing and Related Problems," Concrete Construction Magazine, 426 S. Westgate, Addison, Illinois 60101.
7. "Handling, Placing, Finishing and Curing Concrete," Eugene D. Hill, Jr., NRMCA Publication No. 177.



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