Concrete Atlantic béton Atlantique

Concrete Tech-Tip #16

Finishing Concrete Flatwork

What is Finishing?

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

Example of Finishing Concrete

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 mixtures and field conditions. Having the proper manpower and equipment available, and timing the operations properly for existing conditions, is critical. A slope of 10 mm per meter 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 successful job depends on selecting the correct concrete mix for the job. Consult your Ready Mixed Concrete Producer.
- 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.
- Spread the concrete using a short-handled square-ended shovel and a concrete rake. Do not use a garden rake as it can cause segregation.
- Consolidate concrete and tamp the concrete along the edges of the forms to release air voids and consolidate the concrete.
- Use a wood 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 scree to fill in any low spots.

Things to Consider When Finishing

a. **FLOAT** the concrete as soon as it has been struck off. A float is a wood or magnesium 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 along-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. Never use a steel trowel as a float.

b. **WAIT** for the concrete to stop "bleeding". "Bleeding" occurs as the solids in the concrete settle. All other finishing operations must wait

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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 amount of water, cement and chemical admixtures in the concrete; and the weather. This step is especially critical for mixture containing Portland limestone cement which are known to bleed slower than ordinary portland cement mixtures.

c. **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.

d. **JOINT** the concrete by grooving it. The jointer should have a blade at least-one-fourth the depth of the slab (25mm deep joints on a 100mm slab). Use a straight piece of lumber as a guide. A shallow-bit groover should only be used for decorative grooves.

e. **TROWEL** the concrete according to its end use. For sidewalks, patios and driveways, a broom finish is recommended. 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.

f. **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 colour, integral colour, and stamped or patterned concrete.

g. **NEVER** sprinkle water or cement on concrete while finishing it. This may cause dusting orscaling.

h. **CURE** the concrete as soon as all finishing is completed and the water sheen has left the surface. Some methods of curing are liquid curing compounds; plastic to cover the concrete; ponding; continuous sprinkling; burlap, and straw or sand that is kept wet. Plastic or sand may discolor the concrete surface.

Three Rules to Consider:

1. Float and level properly. Use a wood or magnesium float to embed aggregate and smooth the surface and never float while bleed water is still present.
2. Edge and joint carefully. Round slab edges and create contraction joints to control cracking and ensure a functional, durable surface.
3. Cure and protect the surface. Avoid sprinkling water or cement, and apply appropriate curing methods immediately after finishing to retain moisture and prevent defects.

References

1. CSA A23.1 A23.2 2024. Concrete materials and methods of concrete construction Test methods and standard practices for concrete. CSA Group

2. Design and Control of Concrete Mixtures. 9th Edition. Cement Association of Canada