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5th Edition - Joints in Floors >>

Joints present one of the biggest problems in floors – and the biggest challenge in terms of design and maintenance. So why are joints needed?

Concrete is a strong durable material and is the only really effective material for floors in warehouses and distribution centres. However, it has one shortcoming - it shrinks. The hardening of concrete is a chemical process caused by a reaction between the cement and water that are used but only about half of the water added to the concrete is actually used in this chemical reaction. The rest of the water is needed to make the concrete fluid enough to be placed and finished and this water leaves the concrete as the floor dries out - causing the floor to shrink. I will come back to this when we look at cracking in a later article.

The joints are provided to allow individual sections of the floor to shrink. Without the joints, the floor would crack. Joints are also needed because there is a limit on how much floor can be laid in one session.

Floor joints are sometimes referred to as EXPANSION joints. They are not for expansion, only for CONTRACTION. The fact is that the floor never gets any bigger than the day on which it is built. This difference is important as an expansion joint starts out with a filler strip of maybe 20 mm. When the floor shrinks this gap gets wider and you can end up with gaps of 30 mm in the floor. Wide joints are more easily damaged by fork lifts and in particular by pallet trucks.

There are two basic types of joints. Formed joints are usually found at the end of a day's concrete pour and can be known as day joints or construction joints. These joints can be anything up to 50 metres apart. The other type are induced joints. These are the ones found at about six metre intervals in many floors. They are created by saw cutting part way through the slab so that cracks are formed along these weakened lines in the floor.

Many floors have both types of joint, with the areas or bays between the formed joints cut into the smaller areas or panels. These floors are known as jointed floors. Some floors are constructed without the intermediate saw cuts and are known as "jointless" floors. Despite there name, "jointless" floors still have the formed joints at up to 50 metres apart – unless it is a smaller floor. Perhaps they should be known as "less joint" floors!

Joints are not just gaps in the floor they have dowels or similar mechanisms and have a very important function in transferring or sharing loads between adjoining sections of floor. Slabs edges can only carry about half the load that can be carried at slab centres and sharing loads is therefore very important, otherwise floors would need to be much thicker.

As floors shrink or contract, designers also have to make sure that they do not bind up on obstacles such as roof columns. Column bases and similar are therefore surrounded by a compressible material. These are known as isolation details. They are sometimes known as isolation joints, but that description is best avoided as they are not intended to provide any jointing between the floor and the obstacle – indeed the very opposite.

Next edition Maintenance of joints in floors

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