



A leaking crack in a fish tank in Arizona, United States.

Effective Crack Prevention, Control and Repair

Concrete is a mixture of aggregate, cement and water. The water combines with cement to create the glue that holds it all together. But there is nearly always more water added than is needed to hydrate the cement – usually about twice as much. This is because extra water is necessary to make the concrete mixture workable during placing, consolidation or pumping. Some of this additional water, also known as water of convenience,

bleeds out of the wet concrete while it's still soft. The remaining water evaporates from the concrete over the next several weeks and months. As the concrete dries, it shrinks and the resulting tensile stress results in cracks.

There are three things that you can do about cracks: prevent, control or repair them.

Prevention Methods

You cannot expect to prevent all cracking; but it is possible to significantly reduce the number of cracks by taking a few important measures.

The number one way to prevent concrete cracking is to reduce the amount of water added. Less water mixed into the concrete means there will be less water to leave the concrete when it dries and as a result, less shrinkage will occur. Water should

be reduced to the minimum amount required to still allow proper placement and compaction of the concrete. Using chemical water reducers will allow quite a large reduction in water and still provide workable concrete. The gradation of your aggregates has an influence as well because fine aggregates demand significantly more water than coarse aggregates. Be cautious of concrete mixes with too much sand or a high cement content that will demand more water. More cement may mean higher strength, but it may also result in more shrinkage and additional cracks. An experienced and knowledgeable concrete supplier can deliver you a well proportioned mix that will minimize shrinkage.

Heat generated by the hardening concrete (heat of hydration) will cause concrete to expand slightly. This can lead to cracking when the concrete cools and contracts after it has hardened. Mass concrete and hot weather will contribute to this



A pool and foundation that required repair in Mexico.