

# Impact Of Bad Formwork Of Concrete In Its Service Life

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Formwork plays a vital role in reinforced concrete (RC) design, providing support for the concrete until it gains adequate strength. Its complexity can range from simple cubic boxes to intricate spline surfaces. While formwork design is a specialized area of concrete engineering, this article focuses on how poor formwork affects the service life of RC structures, particularly in terms of mechanical strength.

## Misalignment

One of the most prevalent issues in construction is the misalignment of formwork. Beyond being visually unappealing, excessive misalignment can alter the structural behavior. It directly impacts the concrete cover thickness; a larger cross-section than intended can lead to overstressing due to added dead weight, while a thinner section may compromise structural integrity.

For instance, in beams, a misaligned cover thickness on the compression side can prevent the concrete from achieving its designed strength, resulting in sections that are prone to creep and fatigue. In areas where the tension side has insufficient cover, while it may not immediately affect strength, the exposed steel bars become more vulnerable to corrosion, ultimately shortening the service life of the structure.

## Leakage

Another frequent issue is the leakage of cement paste from formwork joints, which often results in honeycombing when the formwork is removed. This loss of cement paste prevents proper bonding between aggregates, reducing the hardened concrete's overall strength and durability.

## Friction

Friction between the formwork and hardened concrete can create challenges during removal. If the bond is too strong, it may require excessive force to detach the formwork, potentially leading to surface cracks or, in severe cases, spalling. Although construction workers might attempt to conceal these defects with plaster, early damage to the concrete surface can accelerate degradation over time.

In summary, proper formwork design and installation are essential to ensure the mechanical strength and longevity of reinforced concrete structures. Neglecting these aspects can lead to significant issues that compromise structural integrity and service life.