

Light decay value of cold joint



AI Overview

A cold joint in concrete can significantly reduce light transmission due to incomplete bonding and micro-voids, causing scattering and attenuation of light. Understanding Light Decay in Cold Joints A cold joint occurs when fresh concrete is poured against partially hardened concrete, creating a discontinuity between layers. While structurally these joints may be linear and closely bonded, they often contain micro-voids, air pockets, or slight gaps where the two layers did not fully integrate. These imperfections act as scattering centers for light, causing attenuation and diffusion, which reduces the intensity of light passing through the joint. Factors Affecting Light Decay Degree of Bonding: Poorly bonded joints with visible separation or voids scatter more light, increasing decay. Surface Roughness: Uneven surfaces at the joint interface cause refraction and reflection, further reducing transmitted light. Concrete Composition: Variations in aggregate size, cement content, or moisture at the joint can alter optical properties. Thickness of the Joint: Thicker or more porous joints increase the path length for scattering, leading to higher light loss. Practical Implications In translucent concrete applications, cold joints can create visible lines or shadows due to light attenuation. For optical inspection or non-destructive testing, light decay at cold joints can indicate the presence of voids or incomplete bonding. While exact quantitative values of light decay depend on the joint's microstructure, even small gaps or air pockets can reduce transmitted light by 10–50% in typical translucent concrete panels. Mitigation Proper vibration and consolidation during pouring reduce voids at the interface. Epoxy injection or overlaying can fill gaps and restore optical continuity, improving light transmission. Minimizing delays between pours ensures better integration and reduces scattering sites. In summary, a cold joint inherently causes light decay due to scattering and imperfect bonding, and the extent depends on the joint's quality, porosity, and surf...

Article Content

Analytical Method and Analysis of Cold-Joint Interface

Cold-joint interface behaviour analysis was performed by predicting the shear stress and slippage values using the proposed analytical method, by

Effects of Decay on the Mechanical Properties of Nailed Joints in Light ...

Effect of decay on the OSB was much greater than the impact on the SPF. The decay grade of the nailed joints was established according to the linear relationship between weight loss

Critical cold joint angle in concrete

In addition to the concrete grades, cold joint angle is also a parameter to be investigated. Zero angle was the control angle. Besides, 20, 45, 65 and 90 degrees were studied to understand

Cold Joint in Concrete and Methods of Treatment

2. When Cold Joint is Hardened a Bit In case concrete has hardened a bit more than plastic state but can still be easily removed by a light hand pick, the surface will

Experimental Investigation of the Effect of Cold Joint on ...

Abstract This study investigated the effects of cold joints on the strength and some durability properties of concrete. In the first part of the study, fresh concrete was poured into molds filling them half in order

Fatigue fracture experiment of concrete members with cold joints

The fatigue life of experimental components with cold joints reduces with stress and stress amplitude raising. Under the same initial stress and stress amplitude, the fatigue life of concrete

Degradation mechanisms of concrete cold joint surfaces under sulfate ...

In cases of chemical erosion, such as sulfate erosion, the cold joint surface becomes the primary pathway for ion circulation, initiating erosion damage. Sulfate ions and hydration products

Non-Destructive Evaluation of Cold Joints in Concrete

This technical note briefly discusses non-destructive evaluation of cold joints in concrete structures. We will review how structural engineers and quality

Lining cold joint defect formation mechanism and pouring interval ...

Abstract Cold joints, a prevalent defect in mass concrete casting, pose significant risks to the structural integrity and load-bearing capacity of constructions. Despite their critical implications,

Energy evolution of concrete with cold joint under the action of ...

Yang et al. quantitatively evaluated experimentally the effect of time and cold joint structural surface on the diffusion coefficient of chloride ions in concrete and pointed out the best

Mechanics-based model for cold joints in reinforced concrete members

Abstract This study introduces a mechanics-based numerical model to characterize the behavior of cold joints in reinforced concrete members subjected to monotonic loading.

Impact of Construction Joints on the Structural Performance of ...

The review explored how cold joints impacted key properties like flexural strength, ductility, and energy dissipation capacity, drawing on numerous experimental studies.

Shear strength in reinforced concrete beams with cold joint

Cold joints in reinforced concrete (RC) beams can significantly impact shear behavior, influencing stress distribution and failure patterns. This study examines how delay times, compressive strength, and

Cold Joint During Monolithic Concrete Works: Understanding and ...

The paper considers the conditions of occurrence of cold joints of concreting depending on the technological indicators of concrete mixtures quality and paving technology.

Fracture performance and fracture characteristics of concrete

Thus, this study investigates types of cohesive elements used for simulating cold joint defects in concrete to aid the analysis of the crack propagation law and the structural failure modes

Effect of Fatigue Loading and Precracking on the Interface Shear ...

This paper investigated the shear strengths (that is, the ultimate strength, post-ultimate residual strength and failure strength) and shear transfer mechanism of cold joints after experiencing

Using acoustic emission parameters to study damage and fracture ...

Discontinuous pouring of concrete members leads to the formation of cold joints, thus increasing the risk of structural cracking. In this study, a three-point bending test was performed to

Fatigue fracture experiment of concrete members with cold joints

To investigate the fatigue fracture performance of concrete with cold joint defects, this study conducted fracture experiments using static load and interface nanoindentation experiments on

Effect of cold joint on the flexural strength of RC beam

The aim of the present study is to determine the loss in the flexural strength capacity of a reinforced concrete (RC) beam due to the presence of cold joint under two conditions: (i) different

Effect of Cold Joint and Its Direction on The

This study would to test the compressive and flexural strength due to the effect of cold joint in the concrete.

Analysis method for cracking and safety status of plain concrete lining ...

The cold joint defect is an initial issue arising from the discontinuous pouring process commonly encountered in large-volume concrete structures, particularly in tunnel lining. However, as

(PDF) Mechanical behavior of concrete cold joints

In this paper, the problem of the generation of cold joints is approached from two complementary perspectives.

Cold Solder Joint: Understanding and Prevention

A cold solder joint is a defect caused by improper melting of solder to bond PCB electronic components. This defect can impact the functionality of a

Numerical Investigation of Evaluating the Degree of Damage in ...

Numerical findings indicate that cold joints are detectable with a void ratio of 40% or greater. For the 60% and 80% void ratios, surface wave velocities register notably lower for wavelengths below 0.1 m

Light cold dark matter from non-thermal decay

We investigate the mass range and the corresponding free-streaming length scale of dark matter produced non-thermally from decay of heavy objects which can be either dominant or sub

Business Standard

Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

Understanding Cold Joints: Causes, Prevention, And Impact On

Learn about cold joints in concrete: their causes, prevention methods, and impact on structural integrity. Essential for durable construction.

An experimental and numerical study on the effects of cold joint ...

Cold joints, formed due to interruptions in the concrete placement process, significantly impact the mechanical behavior of concrete structures. This study comprehensively examines the

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