



IS 13990: 1994 Precast reinforced concrete planks and joists for roofing and flooring — Specification

Precast reinforced concrete planks and joists are structural components widely used in construction for **roofing and flooring** systems. These are manufactured **off-site** in a controlled environment and then transported to the construction site, where they are assembled.

Precast Concrete Planks are flat concrete elements that form the **primary flooring or roofing surface** with reinforcement steel embedded in them.

Precast Concrete Joists are the **supportive beams** placed beneath the planks, providing additional load-bearing support and for distribution of load. Joists also have reinforcement steel embedded in them.

Precast reinforced concrete planks are partially precast rectangular slab elements which are supported over partially precast RCC joists side by side. These are **joined together and to the joist by pouring in-situ concrete** over the haunches provided in the planks and the gaps between the planks over the joists. Monolithic action of the slab elements is ensured by leaving stirrups projecting out of joists and providing reinforcement across the joists over haunched portion of planks, tying them together and pouring in-situ concrete over it.

Considering the shortage of houses in the country and rapid development needed in line with various housing schemes of Government of India, new building techniques were required which are **simple, economical and ensure speedy construction**. Thus, this technology evolved to ensure faster and **high quality of construction, reduced labour costs and low wastages**. Moderate size components are used which eliminate the need for mechanical handling and erection equipment. This type of construction is mainly done in **residential, commercial and public buildings**.

The quality of precast reinforced concrete planks and joists depends on various parameters like load bearing capacity, dimensional accuracy for modular construction, durability and resistance to environmental factors, low water absorption, bonding of different elements, consistency of concrete mix and fire resistance. All these parameters **ensure structural integrity, durability, and safety of the structure**.

This Indian Standard, originally published in 1994, specifies the requirements for materials, shape, dimensions and tolerances, design and reinforcement, and casting and curing of the elements. The performance against these is ensured by performing **tests for dimensional conformity, deflection recovery, failure load etc**. It may also be noted that this Product Specification standard shall be read in conjunction with **IS 13994: 1994** 'Design and construction of floor and roof with precast reinforced concrete planks and joists — **Code of practice**'.

Thus, the IS 13990 and IS 13994 enables for construction using precast planks and joists such that the overall construction is speedy, economical and the structure is durable.