INTERNATIONAL STANDARD

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Performance standards in building — Performance test for precast concrete floors — Behaviour under concentrated load

Normes de performance dans le bâtiment — Essai de performance des planchers préfabriqués en béton — Comportement sous charge concentrée

Reference number
ISO 9883:1993(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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Performance standards in building — Performance test for precast concrete floors — Behaviour under concentrated load

1 Scope

This International Standard defines test procedures for determining the performance of floors and floor elements under concentrated loads. The tests are:

— transverse dynamic bond test on finished floor,

— penetration resistance test of the finished floor, and

— indentation/bending test on filler blocks (this test is designed to verify safety at the assembly stage).

This International Standard applies to all kinds of precast concrete floors, to components, or thin subcomponents (⩽ 2 m approx.).

2 Test machine

Any press which develops a force sufficient to break the test piece may be used.

Transmission of the forces to the test piece are by means of a ball joint.

3 Transverse dynamic bond test on finished floor

3.1 Principle

A full-size test piece receives concentrated loads on the median longitudinal strip.

In this way it is possible to evaluate

— the transmission of the loads to other parts of the test piece, and

— the strength of the floor parts through which this transmission is carried.

3.2 Test pieces

Test pieces are made up as follows:

a) for floors of joists and filler blocks:

— 5 joists and 4 rows of filler blocks, assembled as indicated;

b) for hollow slab floors:

— 5 slabs placed side by side and keyed with infill concrete.

They shall be coated on the underside with a thin coat of gypsum, to facilitate crack detection.

3.3 Test procedure

The test body shall be laid on two simple end supports.

The loads shall be applied by means of rigid plates measuring 200 mm × 200 mm at 1/4 and 3/4 of the span on the longitudinal axis of the test piece surface.

The load shall be applied in increments (five equal increments) of 500 N on each plate. At each increment, the underside of the test piece shall be observed and the load shall then be increased by increments again until rupture of the keying or the floor. Deflection of the element shall be measured at mid-span in the axis of each of the joists or hollow slabs.

3.4 Presentation of results

The following items shall be recorded:

a) the loading diagram;

b) the condition of cracking on the underside subjected to the maximum load;

c) the load at which any defects become visible;

d) a diagram of the flexural deformations (representation of the transverse deformation with different increments).

4 Penetration resistance test of finished floor

4.1 Principle

For floors without a distribution/compression slab, penetration tests shall be carried out on the filler blocks or covered hollow elements, at their points of least resistance. A steel cylinder, 25 mm in diameter, with a rounded contact edge (radius = 1 mm) shall be used.

4.2 Test piece

A test piece consists of a filler block, or a hollow slab covered with a layer of fine cement mortar 5 mm thick, and a piece of plastic floor-covering 1,5 mm thick.

The test piece shall rest on a continuous support with insertion of a distribution layer.

4.3 Test procedure

For each of the test points anticipated, the load shall be progressively raised to 5 kN, then continued until rupture of the test piece.

4.4 Presentation of results

The following items shall be recorded:

a) any defects observed during loading, and the value of the load which has caused them;

b) the value of the load at rupture.

5 Indentation/deflection test of filler blocks

5.1 Principle

The resistance of the filler blocks to indentation loads (those applied by the personnel during construction of the floor) is evaluated by application of a localized load to the filler blocks with their edges resting on their normal supporting edges. The load shall be applied by means of a device adapted to the constitution of the filler block (concrete, fired clay, etc., or cellular plastic insulation).

5.2 Test pieces

Test pieces are made up of filler blocks resting simply on supports representing the joists or ribs of the floor. The position of the filler blocks with respect to the supports shall be adjusted so that the transmission of the forces is carried out exclusively by the normal transmission surfaces (see figure 1).

5.3 Test procedure

Apply a load F by means of

— a piece of hardwood, with cross-section of 50 mm × 50 mm, for filler blocks of concrete, fired clay, chipboard, etc.,

— a hardwood footing, as shown in figure 1, for filler blocks made of cellular plastic; in all cases, the load shall be transmitted to the piece of wood by a hinge.

The piece of wood shall be placed (with its axis perpendicular to the direction of the span of the filler block when the latter is made of cellular plastic) in contact with the upper surface of the filler block in the most unfavourable of the two positions, lateral or axial (see figure 2).

Increase the load progressively until rupture of the test piece.

5.4 Presentation of results

For each position of the load application point, the load rupture value and the shape of the break shall be recorded.

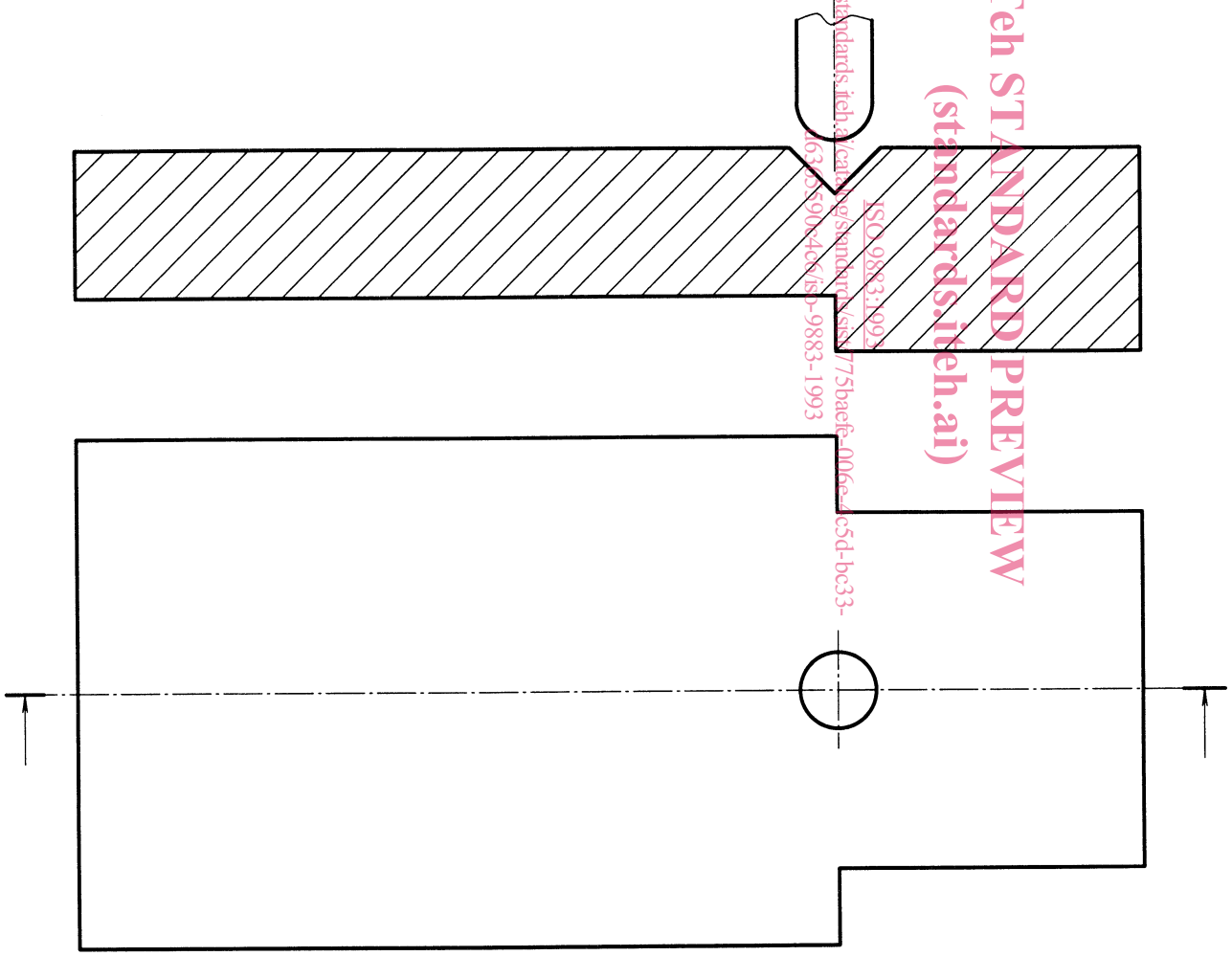

Figure 1 — Top view and cross-section of footing

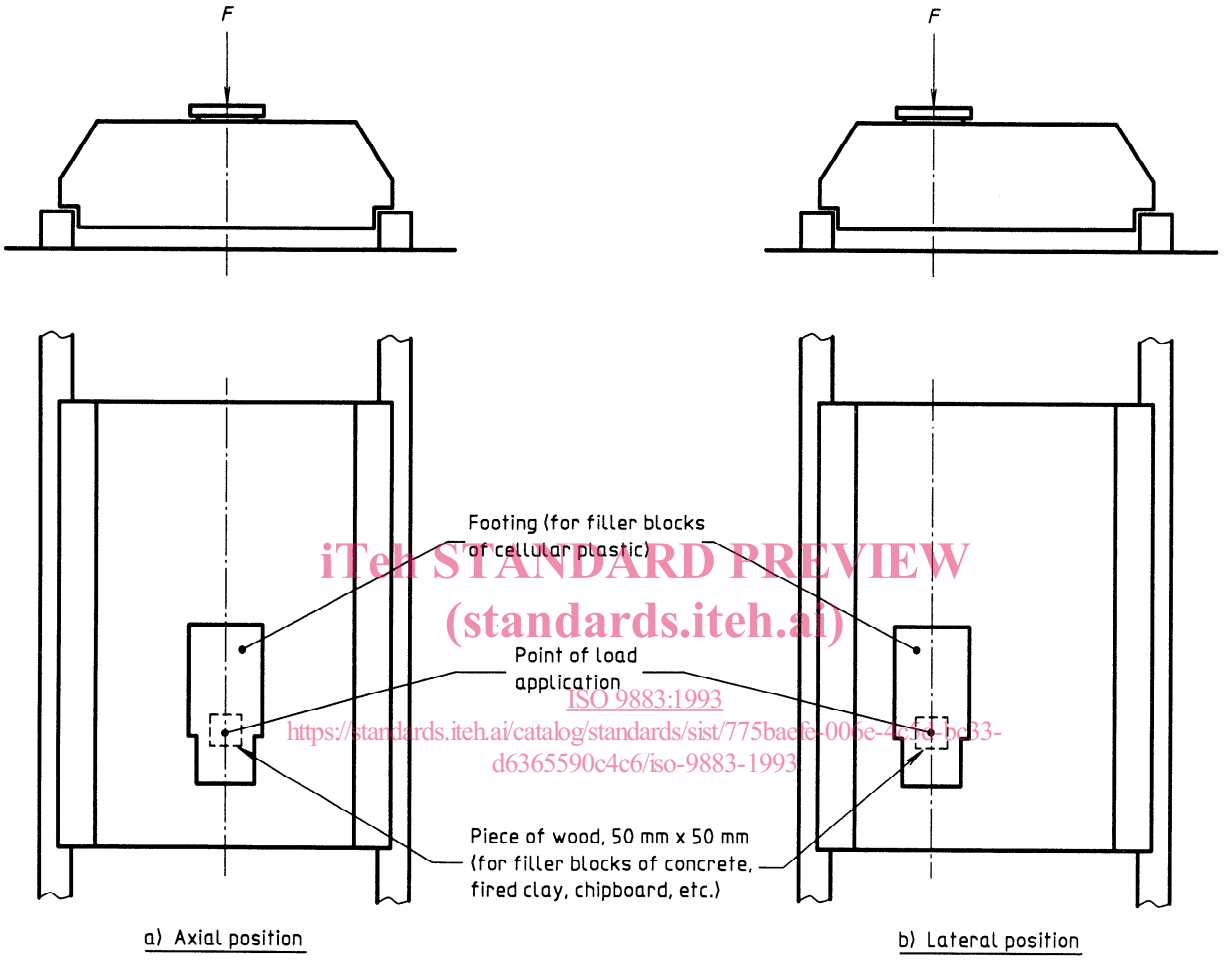

Figure 2 — Position of footing on the filler block under test

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