SLOVENSKI STANDARD
SIST EN 1168:2005/oprA1:2007

01-oktober-2007

Montaģni betonski izdelki - Votle ploġļ e

Precast concrete products - Hollow core slabs

Betonfertigteile - Hohlplatten

Produits préfabriqués en béton - Dalles alvéolées

Ta slovenski standard je istoveten z: **EN 1168:2005/prA1**

ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products

SIST EN 1168:2005/oprA1:2007 **en**

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Precast concrete products - Hollow core slabs

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Betonfertigteile - Hohlplatten

This draft amendment is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 229.

This draft amendment A1, if approved, will modify the European Standard EN 1168:2005. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 1168:2005/prA1:2007) has been prepared by Technical Committee CEN/TC 229 “Precast concrete products”, the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

1 Modification to Clause 1 Scope

In the 1st sentence of the 6th paragraph change “450” *into* “500”.

2 Modification to 4.3.1.1 Production tolerances

Change the numbering of the second subclause numbered “4.3.1.1.1” *into* “4.3.1.1.2” *and the numbering of subclause* “4.3.1.1.2” *into* “4.3.1.1.3”.

3 Modification to 4.3.1.1.2 Tolerances for concrete cover

In point 4.3.1.1.2 (now 4.3.1.1.3) introduce the sentence “The maximum deviation for concrete cover shall be Δc=-10 mm. A more stringent tolerance can be declared by the manufacturer”.

4 Modification to 4.3.1.2.2 Minimum concrete cover and axis distances of prestressing steel

Replace ” - when the nominal centre to centre distance of the strands ≥ 3 Ø : *c*min = 1,5 Ø ;
- when the nominal centre to centre distance of the strands < 2,5 Ø : *c*min = 2,5 Ø ;
- *c*min may be derived by linear interpolation between the values calculated in a) and b);

Where

Ø is the strand or wire diameter, in millimetres (in the case of different diameters in a strand, the average value shall be used for Ø).
For ribbed wires, the concrete cover shall be increased with 1 Ø.”

with:

a) “when the nominal centre to centre distance of the strands is ≥ 3 ϕ: $c_{\min}$ = 1,5 ϕ;

b) when the nominal centre to centre distance of the strands is < 2,5 ϕ: $c_{\min}$ = 2,5 ϕ;

where ϕ is the strand or wire diameter, in millimetres (in the case of different diameters, the average value shall be used for ϕ).

For intermediate centre to centre distance, $c_{\min}$ may be derived by linear interpolation between the values defined in a) and b).

For ribbed wires, the concrete cover shall be increased by 1 ϕ.”

5 Modification to 4.3.3.2.1 Resistance to splitting for prestressed hollow core slabs

In the title of 4.3.3.2.1 and in the rest of the text of 4.3.3.2.1, replace five times “splitting” *with* “spalling”.

6 Modification to 4.3.3.2.2.1 General

Change the title "General" *into* "Shear capacity"

Add the following text after the title (before the existing statement):

"For hollow-core slabs without shear reinforcement, the shear resistance of the regions cracked by bending shall be calculated using expressions (6.2a) and (6.2b) of EN 1992-1-1:2004.

For prestressed single span hollow-core slabs without shear reinforcement, the shear resistance of the regions uncracked by bending (where the flexural tensile stress is smaller than $f_{ctk0,05}/\gamma_c$), the shear resistance should be calculated with the following expression:

$$V_{Rdc} = \frac{I b_w(y)}{S_c(y)} \left(\sqrt{(f_{ctd})^2 + \sigma_{cp}(y) f_{ctd}} - \tau_{cp}(y) \right)$$

where

$$\sigma_{cp}(y) = \sum_{t=1}^{n} \left\{ \left[\frac{1}{A} + \frac{(Y_c - y)}{I} \right] \cdot P_t(l_x) \right\} + \frac{M_{Ed}}{I} \cdot (Y_c - y)$$

$$\tau_{cp}(y) = \frac{1}{b_w(y)} \cdot \sum_{t=1}^{n} \left\{ \left[\frac{A_c(y)}{A} - \frac{S_c(y) \cdot (Y_c - Yp_t)}{I} + Cp_t(y) \right] \cdot \frac{dP_t(l_x)}{d_x} \right\}$$

This expression shall be applied with reference to the critical points of a straight line of failure rising from the edge of the support with an angle β = 35° with respect to the horizontal axis. The critical point is the point on the quoted line where the result of the expression of $V_{Rd,c}$ is the lowest.

The definition of symbols is given here below:

I is the second moment of area of the cross section

$b_w(\gamma)$ web width at the critical point

γ_c is the height of the centroidal axis

$S_c(\gamma)$ is the first moment of the area above height y and about the centroidal axis

γ is the height of the critical point on the line of failure

l_x is the distance of the considered point on the line of failure from the starting point of the transmission length (= x)

$\sigma_{cp}(\gamma)$ is the concrete compressive stress at the height y and distance l_x

n is the number of tendon layers

A is the area of the cross-section

$P_t(l_x)$ is the prestressing force in the considered tendon at distance l_x. The transfer of prestress shall be taken into account according to 8.10.2.2 of EN 1992-1-1:2004

M_{Ed} is the bending moment due to the vertical load, for this expression the bending moment may be ignored

$M_{Ed} = 0$

$\tau_{cp}(y)$ is the concrete shear stress due to transmission of prestress at height y and distance l_x

$A_c(y)$ is the area above height y

$Cp_t(y)$ is a factor taking into account the position of the considered tendon layer

$Cp_t = -1$ when $y \leq y\,p_t$

$Cp_t = 0$ when $y > y p_t$

yp_t is the height of the position of considered tendon layer

As an alternative to the above expression, the following simplified expression may be applied:

$$V_{Rdc} = \varphi \frac{I b_w}{S} \sqrt{(f_{ctd})^2 + \beta \alpha_\ell \sigma_{cp} f_{ctd}}$$

where

I/S	is the second over first moment of area (= z lever arm);
$\alpha_\ell = l_x / l_{pt2}$	is the degree of prestressing transmission ($\alpha_l \leq 1{,}0$);
l_x	is the distance of the considered section from the starting point of transmission length;
l_{pt2}	upper value of transmission length (see eq. (8.18) of EN 1992-1-1:2004);
$\sigma_{cp} = N_{Ed}/A$	is the full concrete compressive stress at the centroidal axis;
$f_{ctd} = f_{ctk0,05}/\gamma_c$	is the design value of tensile strength of concrete;
$\varphi = 0{,}8$	reducing factor;
$\beta = 0{,}9$	reducing factor referred to transmission length.

For hollow-core slabs deeper than 450 mm the shear strength, both for regions cracked or uncracked by bending, shall be reduced by 0,9 with respect to the equations quoted above."

7 Modification to 4.3.3.2.2.2 Shear capacity – Torsion capacity

Change the title into "Shear with torsion capacity".

8 Modification to 4.3.3.2.3 Shear capacity of the longitudinal joints

After "$\sum h_f$ is the sum of the smallest thicknesses of the upper and lower flange and the scaled thickness of the topping (see Figure 4)", *add the following sentence*: "where this scaled thickness is the nominal thickness of the topping multiplied by the ratio between the tensile strength of the topping and the tensile strength of the slabs".

9 Modification to 4.3.6 Thermal properties

In the explanation of R_c *change* “contact” *into* “surface”.

10 Modification to 5.2.1.1 Procedure

In indent d) change “4.3.1.1.2a)” *into* “4.3.1.1.1a)” *and in indent e) change* “4.3.1.1.2b)” *into* “4.3.1.1.1b)”.

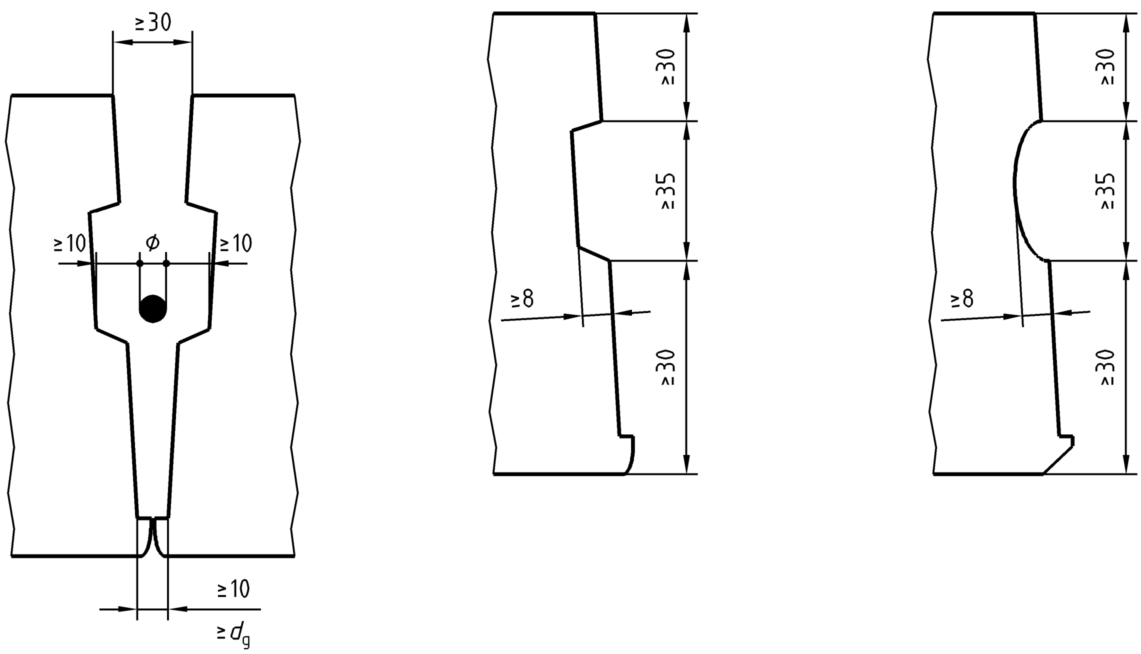
11 Modification to Annex A - Table A.3

In item 1, 4th column (Purpose) change “shear resistance” *into* “failure”.

12 Modification to Annex B - Figure B.1

Change the lower dimension of Figure B.1a) as follows:

Dimensions in millimetres



a) Joint with a tie bar   b) Trapezial groove   c) Semicircular groove

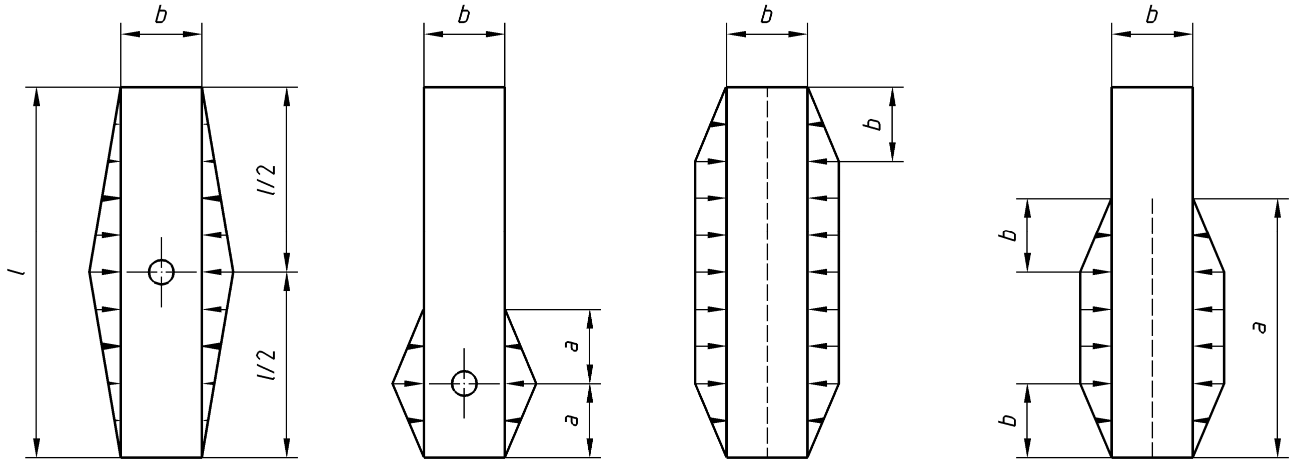
Key

d_g = Largest nominal maximum aggregate size of the mortar of the joint

Figure B.1 — Typical shapes of longitudinal joints

13 Modification to Annex C - Figure C.4

In Figure C.4c) and d) show the position of the load as follows:



a) Point load in centre

b) Point load between centre and support

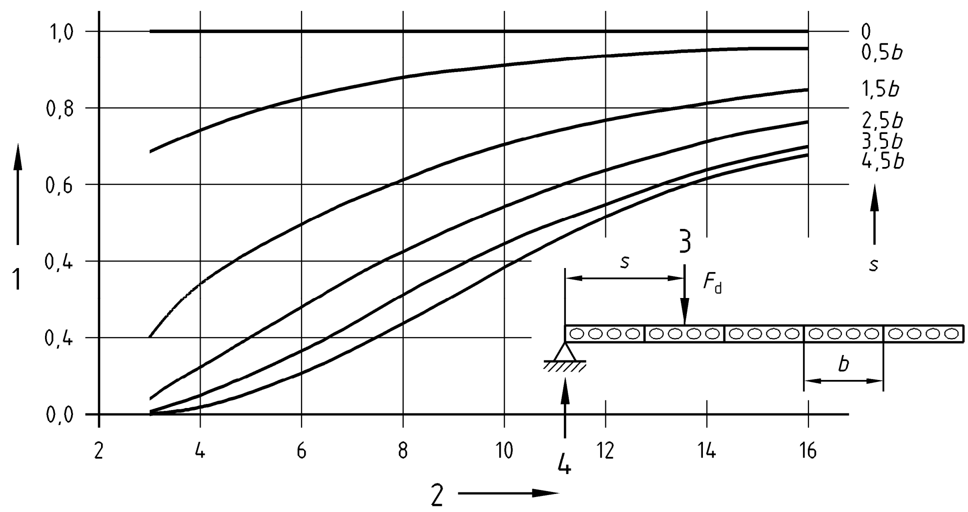
c) Linear load in centre

d) Linear load not in centre

Figure C.4 — Assumed shape of vertical shear forces in joints

14 Modification to Annex C - Figure C.6

In Figure C.6 change the scale as follows:



Key

1 reaction force x span/point load

2 span (*l*) in m

3 point load

4 reaction force

Figure C.6 — Reaction force at longitudinal support due to a point load at midspan