EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1998-3:2005/AC

August 2013
Août 2013
August 2013

English version
Version Française
Deutsche Fassung

Eurocode 8: Design of structures for earthquake resistance - Part 3:
Assessment and retrofitting of buildings

Eurocode 8: Calcul des structures pour leur
résistance aux séismes - Partie 3:
Evaluation et renforcement des bâtiments

Eurocode 8: Auslegung von Bauwerken
gegen Erdbeben - Teil 3: Beurteilung und
Ertüchtigung von Gebäuden

This corrigendum becomes effective on 7 August 2013 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 7 août 2013 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 7. August 2013 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Modifications due to EN 1998-3:2005/AC:2010:

1 Modification to "National annex for EN 1998-3"

Last paragraph, bottom of the table, add the following rows:

"

A.4.4.2(5)	Partial factor γ_{fd} for FRP debonding
A.4.4.2(9)	Partial factor γ_{fd} of the FRP

".

2 Modification to 2.1

Paragraph (2)P, NOTE, replace "the Limit States will be checked in a country" *with* "the Limit States to be checked in a country"*.*

3 Modification to 4.4.2

Paragraph (1)P, replace "of a brced frame, etc.) and by ρ_{max} and ρ_{min}" *with* "of a braced frame, etc.) and by ρ_{max} and ρ_{min}".

4 Modification to 4.6

Paragraph (1)P, Table 4.3, 3rd row ("Type of element or mechanism (e/m)/Ductile")*, 6th column (*"Nonlinear Model/Capacity")*, replace* "In terms of strength. Use mean values of properties <u>divided</u> by CF and by partial factor." *with* "In terms of deformation. Use mean values of properties <u>divided</u> by CF."*.*

5 Modifications to A.3.2.2

Paragraph (1), replace:

$$\theta_{um} = \frac{1}{\gamma_{el}}\, 0{,}016 \cdot (0{,}3^{\nu}) \left[\frac{\max(0{,}01;\omega')}{\max(0{,}01;\omega)} f_c \right]^{0{,}225} \left(\frac{L_V}{h} \right)^{0{,}35} 25^{\left(\alpha \rho_{sx} \frac{f_{yw}}{f_c} \right)} (1{,}25^{100\,\rho_d})$$

" (A.1)"

with:

$$"\theta_{um} = \frac{1}{\gamma_{el}}\, 0{,}016 \cdot (0{,}3^{\nu}) \left[\frac{\max(0{,}01;\omega')}{\max(0{,}01;\omega)} f_c \right]^{0{,}225} \left(\min\left(9;\frac{L_V}{h}\right) \right)^{0{,}35} 25^{\left(\alpha \rho_{sx} \frac{f_{yw}}{f_c} \right)} (1{,}25^{100\,\rho_d}) \quad (A.1)".$$

Paragraph (1), 2nd paragraph before Paragraph (2), replace "expression (A.1) is divided by 1,6." *with* "expression (A.1) is multiplied by 0,58.".

Paragraph (2), replace:

$$\theta_{\mathrm{um}}^{\mathrm{pl}} = \theta_{\mathrm{um}} - \theta_{\mathrm{y}} = \frac{1}{\gamma_{\mathrm{el}}} 0{,}0145 \cdot (0{,}25^{\nu}) \left[\frac{\max(0{,}01; \omega')}{\max(0{,}01; \omega)} \right]^{0{,}3} \cdot$$

$$_{"} f_{\mathrm{c}}^{0{,}2} \cdot \left(\frac{L_{\mathrm{V}}}{h} \right)^{0{,}35} 25^{\left(\alpha \rho_{\mathrm{sx}} \frac{f_{\mathrm{yw}}}{f_{\mathrm{c}}} \right)} (1{,}275^{100 \rho_{\mathrm{d}}})$$

(A.3)"

with:

$$\theta_{\mathrm{um}}^{\mathrm{pl}} = \theta_{\mathrm{um}} - \theta_{\mathrm{y}} = \frac{1}{\gamma_{\mathrm{el}}} 0{,}0145 \cdot (0{,}25^{\nu}) \left[\frac{\max(0{,}01; \omega')}{\max(0{,}01; \omega)} \right]^{0{,}3} \cdot$$

$$_{"} f_{\mathrm{c}}^{0{,}2} \cdot \left(\min\left(9; \frac{L_{\mathrm{V}}}{h} \right) \right)^{0{,}35} 25^{\left(\alpha \rho_{\mathrm{sx}} \frac{f_{\mathrm{yw}}}{f_{\mathrm{c}}} \right)} (1{,}275^{100 \rho_{\mathrm{d}}})$$

(A.3)".

Paragraph (3), replace "(A.1) and (A.3) are multiplied by 0,825" *with* "(A.1) and (A.3) are divided by 1.2".

Paragraph (5), replace "multiplied by 0,575, while the" *with* "multiplied by 0,8, while the".

Paragraph (5), replace "multiplied by 0,375 (with these factors including the reduction factor 0,825 of **(3)** accounting for the lack" *with* "multiplied by 0,75 (with these factors including the reduction factor 1,2 of **(3)** accounting for the lack".

Paragraph (5), final two-entry list, 2ⁿᵈ entry, replace "accordance with **(1)** multiplied by 0,0025 (180 + min(50, $l_{\mathrm{o}}/d_{\mathrm{bL}}$))(1-$l_{\mathrm{o}}/L_{\mathrm{V}}$), while the" *with* "accordance with **(1)** and **(3)** multiplied by 0,019 (10 + min(40, $l_{\mathrm{o}}/d_{\mathrm{bL}}$)), while the".

Paragraph (5), final two-entry list, 2ⁿᵈ entry, replace "accordance with **(2)** multiplied by 0,0035 (60 + min(50, $l_{\mathrm{o}}/d_{\mathrm{bL}}$))(1-$l_{\mathrm{o}}/L_{\mathrm{V}}$)" *with* "accordance with **(2)** and **(3)** multiplied by 0,019 min(40, $l_{\mathrm{o}}/d_{\mathrm{bL}}$)".

6 Modifications to A.3.2.4

Paragraph (2), Equation (A.10a), replace " $\theta_{y} = \phi_{y} \dfrac{L_{v} + a_{v}z}{3} + 0{,}00135 \left(1 + 1{,}5\dfrac{h}{L_{v}} \right) + \dfrac{\varepsilon_{y}}{d - d'} \dfrac{d_{b} f_{y}}{6\sqrt{f_{c}}}$ "

with " $\theta_{y} = \phi_{y} \dfrac{L_{V} + a_{V}z}{3} + 0{,}0014 \left(1 + 1{,}5\dfrac{h}{L_{V}} \right) + \dfrac{\varepsilon_{y}}{d - d'} \dfrac{d_{bL} f_{y}}{6\sqrt{f_{c}}}$ ".

Paragraph (2), Equation (A.11a), replace " $\theta_{y} = \phi_{y} \dfrac{L_{v} + a_{v}z}{3} + 0{,}002 \left(1 - 0{,}135\dfrac{L_{v}}{h} \right) + \dfrac{\varepsilon_{y}}{d - d'} \dfrac{d_{b} f_{y}}{6\sqrt{f_{c}}}$ "

with " $\theta_{y} = \phi_{y} \dfrac{L_{V} + a_{V}z}{3} + 0{,}0013 + \dfrac{\varepsilon_{y}}{d - d'} \dfrac{d_{bL} f_{y}}{6\sqrt{f_{c}}}$ ".

Paragraph (2), Equation (A.10b), replace " $\theta_{y} = \phi_{y} \dfrac{L_{V} + a_{V}z}{3} + 0{,}0013 \left(1 + 1{,}5\dfrac{h}{L_{V}} \right) + 0{,}13\phi_{y} \dfrac{d_{b} f_{y}}{\sqrt{f_{c}}}$ "

with " $\theta_{y} = \phi_{y} \dfrac{L_{V} + a_{V}z}{3} + 0{,}0014 \left(1 + 1{,}5\dfrac{h}{L_{V}} \right) + \phi_{y} \dfrac{d_{bL} f_{y}}{8\sqrt{f_{c}}}$ ".

Paragraph (2), Equation (A.11b), replace "$\theta_y = \phi_y \dfrac{L_V + a_V z}{3} + 0{,}002\left(1 - 0{,}125\dfrac{L_V}{h}\right) + 0{,}13\phi_y \dfrac{d_b f_y}{\sqrt{f_c}}$"

with "$\theta_y = \phi_y \dfrac{L_V + a_V z}{3} + 0{,}0013 + \phi_y \dfrac{d_{bL} f_y}{8\sqrt{f_c}}$".

Paragraph (2), under Equation (A.11b), first line of the definition of "$\alpha_V z$", *replace* "$\alpha_V z$" *with* "$a_V z$".

Paragraph (2), under Equation (A.11b), definition of "$\alpha_V z$", *first line of the sub-definition of* "α_V", *replace* "α_V" *with* "a_V".

Paragraph (2), under Equation (A.11b), definition of "$\alpha_V z$", *last line of the sub-definition of* "$\alpha_V = 1$", *replace* "(i.e. if $M_y < L_V V_{R,c}$) $\alpha_V = 0$," *with* "(i.e. if $M_y < L_V V_{R,c}$) $a_V = 0$,".

7 Modifications to A.4.2.2

Paragraph (2), delete:

"If measures to connect the jacket to the old concrete include roughening of the interface:".

Paragraph (2), delete:

"For all other types of measures to connect the jacket to the old concrete, or if no special measures are taken:

$$\theta_y^* = 1{,}2\,\theta_y \qquad\qquad\qquad (A.19b)".$$

8 Modifications to A.4.3.2

Paragraph (2), Equation (A.21), replace "$V_j = 0{,}5\dfrac{2t_j b}{s} f_{yj,d} \cdot \dfrac{1}{\cos\alpha}$" *with*

"$V_j = 0{,}5h\dfrac{2t_j b}{s} f_{yj,d} \cdot (\cot\theta + \cot\beta)\cdot\sin\beta$".

Paragraph (2), after Equation (A.21), immediately under "where:", *add the following line:*

"h is the depth of the cross-section,".

Paragraph (2), after Equation (A.21), definition of "b", *delete the last word* "and".

Paragraph (2), after Equation (A.21), definition of "s", *delete the last word* "and".

Paragraph (2), after Equation (A.21), just under the definition of "s", *add the following lines:*

"θ is the strut inclination angle,

β is the angle between the axis of the steel straps and the axis of the member ($\beta = 90°$, in case of continuous steel plates), and".

9 Modifications to A.4.4.3

Paragraph (4), replace "rounded to allow wrapping" *with* "rounded to a radius R to allow wrapping".

Paragraph (4), replace "with k_s = 2R_c/D and f_1 = 2" *with* "with k_s = 2R/D and f_1 = 2".

10 Modification to A.4.4.4

Paragraph (3), list entry b)), replace "FRP alone, with $\alpha_{l,f}$=4/n_{tot} and ρ_f, $f_{f,e}$, n_{tot} as defined in **A.4.4.3(6)** for the FRP." *with* "FRP alone, with $\alpha_{l,f}$=α(4/n_{tot}) and ρ_f, $f_{f,e}$, α, n_{tot} as defined in **A.4.4.3(6)** for the FRP.".
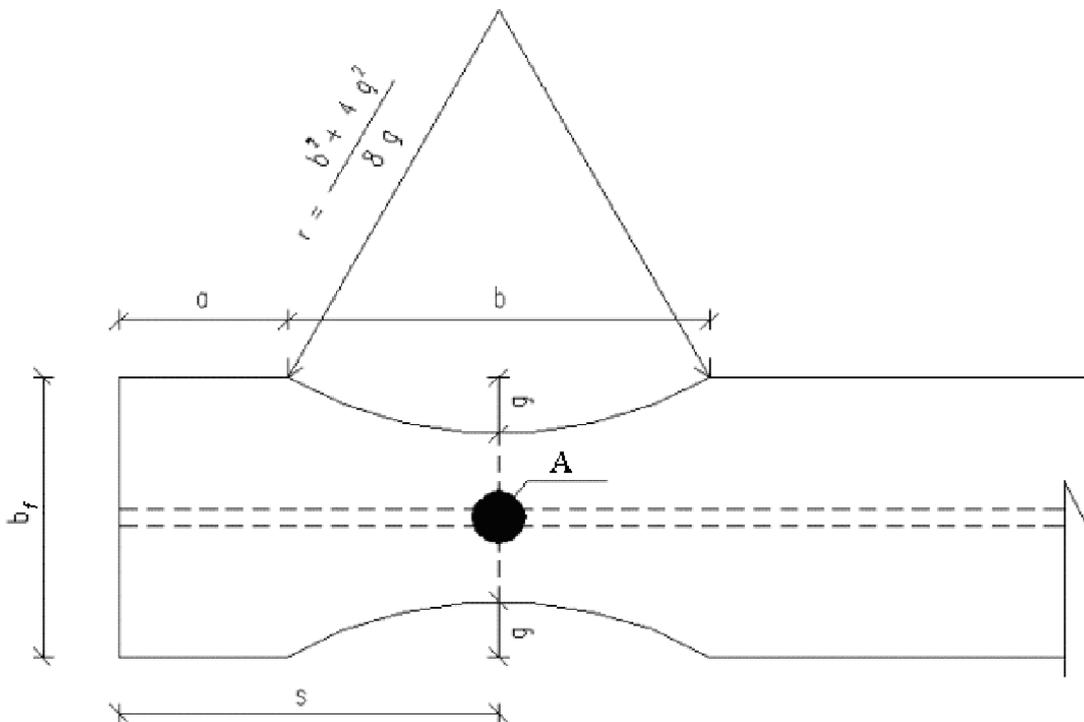
11 Modification to B.5.1

Paragraph (1), replace "should develop full their plastic moments" *with* "should develop their full plastic moments".

12 Modifications to B.5.3.4

Paragraph (3), subparagraph ii., Figure B.1, replace the figure with the following one:

"

".

Paragraph (3), subparagraph vii., replace "cut-depth c and repeat steps (iv) to (vi). The length g should be" *with* "cut-depth g and repeat steps (iv) to (vi). The length b should be".

13 Modification to B.5.4.2

Paragraph (3), replace "($A_a f_{yd}$ + $A_c f_{cd}$ + $A_s f_{sd}$) at the DL LS" *with* "($A_a f_{yd}$ + $A_c f_{cd}$ + $A_s f_{sd}$) (see EN 1998-1:2004, 7.6.4(2)) at the DL LS".

14 Modifications to B.6.2.3.1

Paragraph (5), subparagraph vi., Equation (B.34), replace

$$"d_c \cdot t_{wc} \cdot \frac{f_{yw,d}}{\sqrt{3}} \geq \frac{\sum Z_b \cdot f_{yb}}{d_b} \cdot \left(\frac{L - d_c}{L - d_c - 2 \cdot b}\right) \cdot \left(\frac{H - d_b}{H}\right)"$$ *with*

$$"d_{wc} \cdot t_{wc} \cdot \frac{f_{yw,d}}{\sqrt{3}} \geq \frac{\sum Z_b \cdot f_{yb}}{d_b} \cdot \left(\frac{L - d_c}{L - d_c - 2 \cdot b}\right) \cdot \left(\frac{H - d_b}{H}\right)".$$

Paragraph (5), subparagraph vi., under Equation (B.34), replace:

"d_c is the depth of the column web,"

with:

"d_{wc} is the depth of the column web,".

15 Modifications to C.4.2.1

Paragraph (3), replace "unreinforced masonry wall as controlled by" *with* "unreinforced masonry wall controlled by".

Paragraph (3), last line, replace "the appropriate knowledge level), t is the wall" *with* "the appropriate knowledge level m), t is the wall".

Modifications due to EN 1998-3:2005/AC:2013:

16 Modification to A.3.3.1

Paragraph (2),   *Equation (A.15),*   *replace*

$$"V_{R,max} = \frac{0,85\left(1 - 0,06 \min\left(5; \mu_\Delta^{pl}\right)\right)}{\gamma_{el}}\left(1 + 1,8 \min\left(0,15; \frac{N}{A_c f_c}\right)\right)\left(1 + 0,25 \max(1,75; 100\rho_{tot})\right)\left(1 - 0,2 \min\left(2; \frac{L_V}{h}\right)\right)\sqrt{f_c}\, b_w z"$$

with

$$"V_{R,max} = \frac{0,85\left(1 - 0,06\, min\left(5; \mu_\Delta^{pl}\right)\right)}{\gamma_{el}}\left(1 + 1,8\, min\left(0,15; \frac{N}{A_c f_c}\right)\right)\left(1 + 0,25\, max\,(1,75; 100\,\rho_{tot})\right)\left(1 - 0,2\, min\left(2; \frac{L_V}{h}\right)\right)\sqrt{f_c}\, b_w z".$$

17 Modifications to A.4.4.3

Paragraph (6) replace "increased by $\alpha \rho_f f_{f,e}$," *with* "added with $\alpha \rho_f f_{f,e}/f_c$,".

Paragraph (6), Equation (A.35), replace "$f_{f,e} = \min\left(f_{u,f}, \varepsilon_{u,f} E_f\right)\left(1 - 0,7 \min\left(f_{u,f}, \varepsilon_{u,f} E_f\right)\frac{\rho_f}{f_c}\right)$"

with "$f_{f,e} = min\left(f_{u,f}; \varepsilon_{u,f} E_f\right)\left(1 - min\left[0,5; \ 0,7\, min\left(f_{u,f}; \varepsilon_{u,f} E_f\right)\frac{\rho_f}{f_c}\right]\right)$".