Buckling Proof according to EC 1993 Part 1-5

3.2 Effective width for elastic shear lag

Shear lag reduction for flange 1

Shear Lag is not neglectable

alpha_0: 1.7

Beta: 0.5814128658242435

Shear lag reduction for flange 3

Shear Lag is not neglectable

alpha_0: 1.0

Beta: 0.8741258741258742

<div style="background-color:red">

4.4 Plate elements without longitudinal stiffeners

</div>

Iteratively changing the widths until M_Rd_el_eff converges to a limit of 0.02

<div style="background-color:red">

4.5 Stiffened plate elements with longitudinal stiffeners

</div>

Side 2

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1

Side 3

4.5.4 Interaction between plate and column buckling

all_tension: True

rho_c = 1

Side 4

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1

<div style="background-color:red">

Resistance to shear and interaction shear force and bending moment for side 1

</div>

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 1571.379853123962

eta_3: 0.033903694967485395

7.1 Interaction between shear force, bending moment and axial force

Flange -> (7.1), comment (5)

eta_3 <= 0.5; no interaction needed

utilisation: -1

Proofing Resistance to shear for each subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.03710502485285016

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.032466896746243895

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.027828768639637617

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.023190640533031357

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.018552512426425083

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.013914384319818814

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.009276256213212545

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.004638128106606274

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 4.62206249772755e-18

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.0046381281066062655

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.009276256213212535

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.013914384319818805

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.018552512426425008

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.023190640533031357

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.027828768639637628

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.032466896746243895

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.03710502485285017

eta_3_panel < 1: pass subpanel

<div style="background-color:red;">Resistance to shear and interaction shear force and bending moment for side 2</div>

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 6.4025

eta_3: 0.2538074578374027

7.1 Interaction between shear force, bending moment and axial force

Web -> (7.1) without iterating

eta_3 <= 0.5; no interaction needed

utilisation: -1

<div style="background-color:red; text-align:center; font-weight:bold;">
Resistance to shear and interaction shear force and bending moment for side 3
</div>

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 7.59

eta_3: 0.14629270975403677

7.1 Interaction between shear force, bending moment and axial force

Flange -> (7.1), comment (5)

eta_3 <= 0.5; no interaction needed

utilisation: -1

Proofing Resistance to shear for each subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 7.59

eta_3: 0.1278782427919902

eta_3_panel < 1: pass subpanel

5. Resistance to shear

   unstiffened plate; (A.5)

   k_tau: 6.4025

   eta_3: 0.2538074578374027

7.1 Interaction between shear force, bending moment and axial force

Web -> (7.1) without iterating

   eta_3 <= 0.5; no interaction needed

   utilisation: -1