



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

α_0 : 1.6

Beta: 0.7819557364538499

Shear lag reduction for flange 3

Shear Lag is not neglectable

alpha_0: 1.4

Beta: 0.8825843987896898

4.4 Plate elements without longitudinal stiffeners

Iteratively changing the widths until $M_{Rd_el_eff}$ converges to a limit of 0.02

4.5 Stiffened plate elements with longitudinal stiffeners

Side 2

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1

Side 3

4.5.2 Plate type behaviour

sigma_cr = 319.52863164113415

Lambda: 1.0462130781141281

Rho_Global: 0.7548345598010645

4.5.3 Column type buckling behaviour

Column number 8

A_sl=8761.06, A_sl_eff=8449.54, I_sl=3648949.27

sigma_cr_c=8.63

e1=41.27, e2=24.17

All tension =False

Buckling Values 8

$\beta_{A_c} = 0.9644423730621263$

$\lambda_{c_bar} = 6.297778905251712$

$\Phi_c = 21.503306741085495$

$\chi_c = 0.023773461739189154$

Column number 9

$A_{sl} = 8186.06$, $A_{sl_eff} = 8186.06$, $I_{sl} = 3644157.6$

$\sigma_{cr_c} = 9.22$

$e_1 = 39.57$, $e_2 = 25.87$

All tension = False

Buckling Values 9

$\beta_{A_c} = 1.0$

$\lambda_{c_bar} = 6.2028853485800255$

$\Phi_c = 20.902392398341313$

$\chi_c = 0.024471890755376695$

Column number 10

$A_{sl} = 8186.06$, $A_{sl_eff} = 8186.06$, $I_{sl} = 3644157.6$

$\sigma_{cr_c} = 9.22$

$e_1 = 39.57$, $e_2 = 25.87$

All tension = False

Buckling Values 10

$\beta_{A_c} = 1.0$

$\lambda_{c_bar} = 6.202885348580025$

$\Phi_c = 20.902392398341306$

Chi_c =0.024471890755376702

Column number 11

A_sl=8186.06, A_sl_eff=8186.06, I_sl=3644157.6

sigma_cr_c=9.22

e1=39.57, e2=25.87

All tension =False

Buckling Values 11

beta_A_c =1.0

lambda_c_bar =6.2028853485800255

Phi_c =20.902392398341313

Chi_c =0.024471890755376695

Column number 12

A_sl=8761.06, A_sl_eff=8449.54, I_sl=3648949.27

sigma_cr_c=8.63

e1=41.27, e2=24.17

All tension =False

Buckling Values 12

beta_A_c =0.9644423730621263

lambda_c_bar =6.297778905251687

Phi_c =21.503306741085332

Chi_c =0.023773461739189337

Critical buckling values

Chi_c: 0.023773461739189154

sigma_cr_c: 8.632365418246032

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 0.7548345598010645

Side 4

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 948.2774217990533

eta_3: 0.0177272675422278

7.1 Interaction between shear force, bending moment and axial force

Deck plate is ignored, as it is dimensioned with EC 3-2

Resistance to shear and interaction shear force and bending moment for side 2

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 6.4025

eta_3: 0.20650193893754634

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

Resistance to shear and interaction shear force and bending moment for side 3

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 382.60540634199015

eta_3: 0.020108445295685198

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: 5.382025

eta_3: 0.030643844175926065

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.023426568134491742

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.017569926100868806

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.011713284067245871

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.005856642033622936

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.0011831600067925122

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.005856642033622936

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.011713284067245871

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.017569926100868806

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.023426568134491742

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.382025

eta_3: 0.030643844175926065

eta_3_panel < 1: pass subpanel

Resistance to shear and interaction shear force and bending moment for side 4

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 6.4025

eta_3: 0.20650193893754634

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

