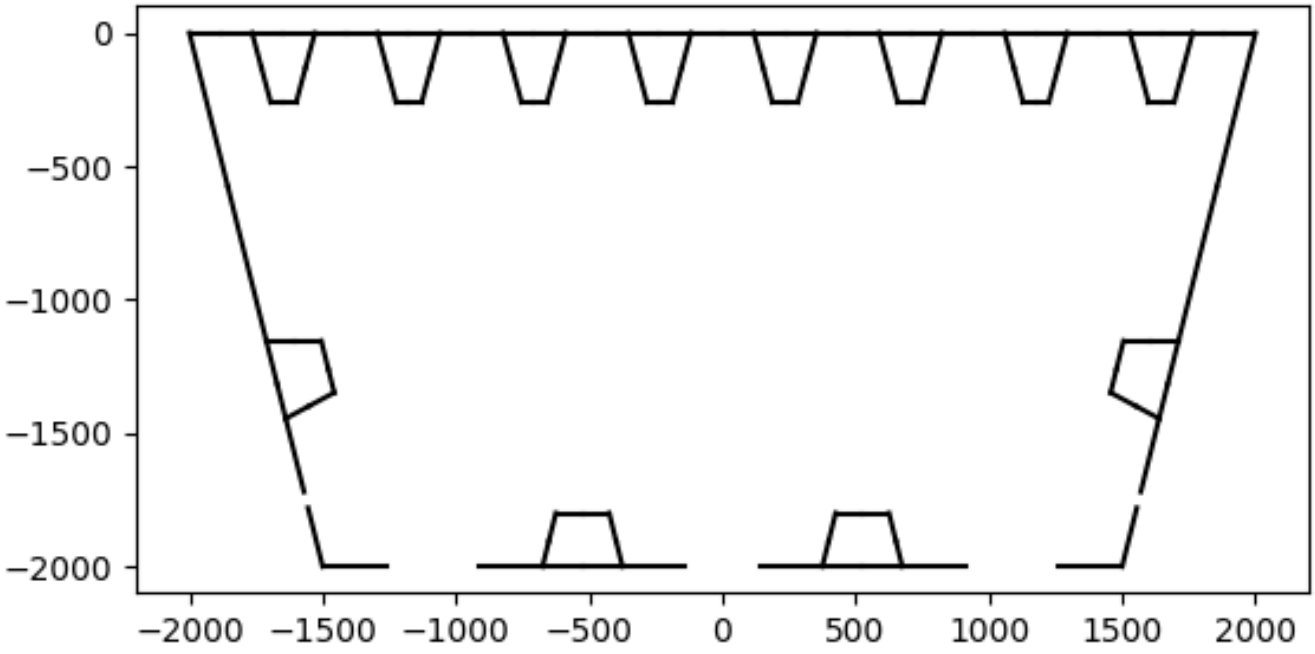


Buckling Proof according to EC 1993 Part 1-5

3.2 Effective width for elastic shear lag

Shear lag reduction for flange 1

Shear Lag is not neglectable

alpha_0: 1.7

Beta: 0.24478873240829493

Shear lag reduction for flange 3

Shear Lag is not neglectable

alpha_0: 1.3

Beta: 0.3855877454628728

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

4.5.2 Plate type behaviour

sigma_cr = 2762.596517303435

Lambda: 0.291450213008637

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 9

A_sl=13386.8, A_sl_eff=13043.61, I_sl=27290271.36

sigma_cr_c=264.07

e1=71.98, e2=60.67

All tension =False

Buckling Values 9

beta_A_c =0.9743634503930891

lambda_c_bar =0.9311710322871

Phi_c =1.0784767266940296

Chi_c =0.6163079515675952

Critical buckling values

Chi_c: 0.6163079515675952

sigma_cr_c: 264.0766078787383

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0

Side 3

4.5.2 Plate type behaviour

sigma_cr = 763.4553085859943

Lambda: 0.5017492377112954

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 10

A_sl=16998.1, A_sl_eff=13902.39, I_sl=27320365.52

sigma_cr_c=208.2

e1=84.87, e2=47.78

All tension =False

Buckling Values 10

beta_A_c =0.8178792681216397

lambda_c_bar =0.960806674379394

Phi_c =1.10708338313521

Chi_c =0.6034751810906328

Column number 11

A_sl=16998.1, A_sl_eff=13902.39, I_sl=27320365.52

sigma_cr_c=208.2

e1=84.87, e2=47.78

All tension =False

Buckling Values 11

beta_A_c =0.8178792681216398

lambda_c_bar =0.960806674379394

Phi_c =1.10708338313521

Chi_c =0.6034751810906328

Critical buckling values

Chi_c: 0.6034751810906328

sigma_cr_c: 208.20206822935626

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0

Side 4

4.5.2 Plate type behaviour

sigma_cr = 2762.596517303435

Lambda: 0.291450213008637

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 12

A_sl=13386.8, A_sl_eff=13043.61, I_sl=27290271.36

sigma_cr_c=264.07

e1=71.98, e2=60.67

All tension =False

Buckling Values 12

beta_A_c =0.9743634503930892

lambda_c_bar =0.9311710322871002

Phi_c =1.0784767266940298

Chi_c =0.6163079515675951

Critical buckling values

Chi_c: 0.6163079515675951

sigma_cr_c: 264.0766078787382

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 1571.021788264538

eta_3: 0.2988082046987719

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: 0.14832990711883806

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.13225644628535996

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.11618298545188181

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.1001095246184037

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.08403606378492556

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.06796260295144745

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.051889142117969314

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.035815681284491176

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.01974222045101305

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.03581568128449115

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.05188914211796928

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.0679626029514474

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.08403606378492554

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.1001095246184037

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.11618298545188185

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.13225644628535996

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.353840830449827

eta_3: 0.1483299071188381

eta_3_panel < 1: pass subpanel

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 21.01369360902256

eta_3: 0.520359254539201

7.1 Interaction between shear force, bending moment and axial force

Web -> (7.1) without iterating

eta_3 > 0.5; interaction needed

utilisation: 0.6724391104922354

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 94.91010475849093

eta_3: 0.26156247342409644

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: 5.51015625

eta_3: 0.1793046625337844

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.3625

eta_3: 0.09077769662046681

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.480625

eta_3: 0.05177784476512376

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.3625

eta_3: 0.09077769662046681

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.51015625

eta_3: 0.1793046625337844

eta_3_panel < 1: pass subpanel

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 21.01353383458647

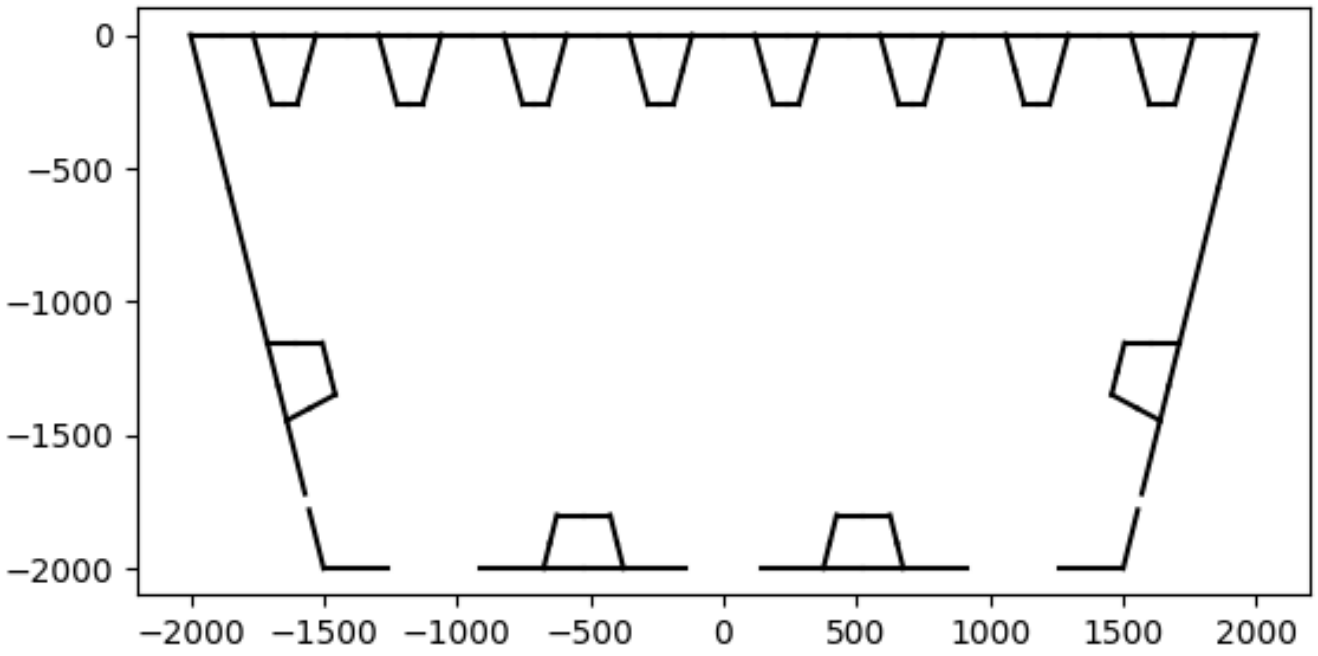
eta_3: 0.6004168070617667

7.1 Interaction between shear force, bending moment and axial force

Web -> (7.1) without iterating

eta_3 > 0.5; interaction needed

utilisation: 0.6928320515539624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