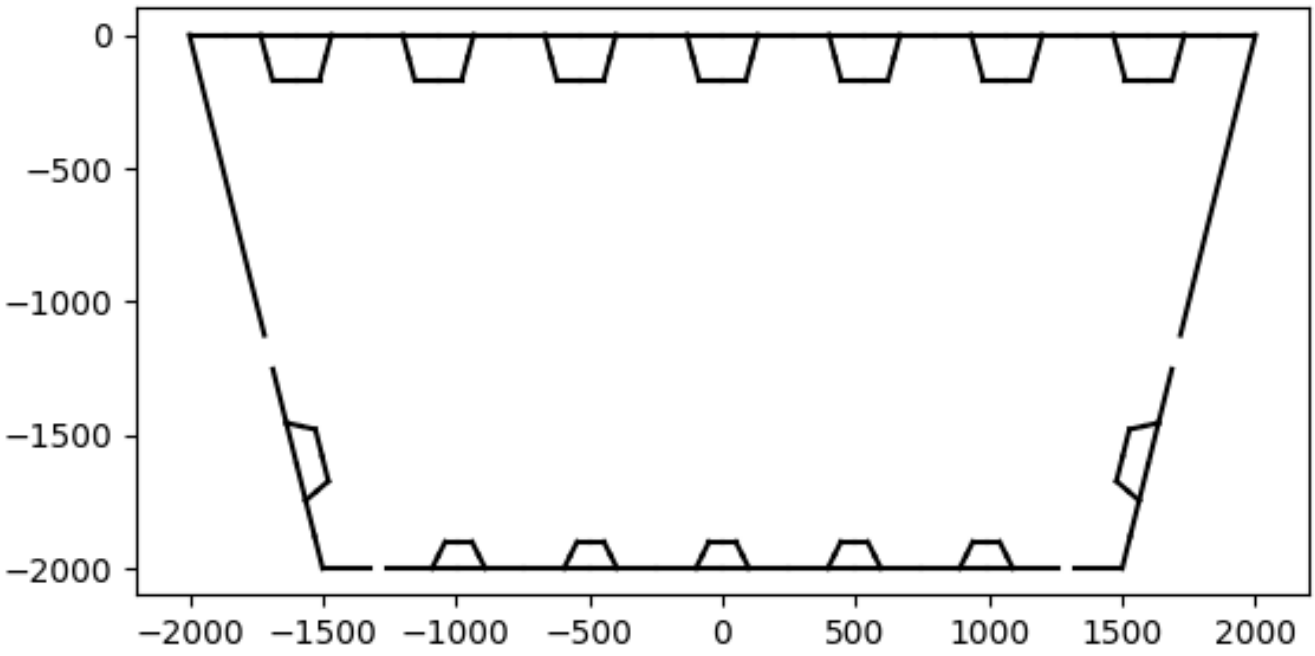
Title of the program

N. Hasler, V. Müller



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: 1.6

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

4.5.2 Plate type behaviour

sigma_cr = 673.0277591707049

Lambda: 0.5929245050189843

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 9

A_sl=12926.75, A_sl_eff=12537.6, I_sl=4595526.08

sigma_cr_c=73682.54

e1=49.48, e2=24.12

All tension =False

Buckling Values 9

beta_A_c =0.9698957713255715

lambda_c_bar =0.06835879648743348

Phi_c =0.47770039043157153

Chi_c =1.0520950998095686

Critical buckling values

Chi_c: 1.0520950998095686

sigma_cr_c: 73682.54243437976

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0520950998095686

Side 3

4.5.2 Plate type behaviour

sigma_cr = 319.52704084485185

Lambda: 1.046215682447394

Rho_Global: 0.7548331811297573

4.5.3 Column type buckling behaviour

Column number 9

A_sl=8761.06, A_sl_eff=8449.54, I_sl=3648949.27

sigma_cr_c=86323.65

e1=41.27, e2=24.17

All tension =False

Buckling Values 9

beta_A_c =0.9644423730621263

lambda_c_bar =0.06297778905251712

Phi_c =0.4756405993995463

Chi_c =1.0558620313003597

Column number 10

A_sl=8186.06, A_sl_eff=8186.06, I_sl=3644157.6

sigma_cr_c=92265.81

e1=39.57, e2=25.87

All tension =False

Buckling Values 10

beta_A_c =1.0

lambda_c_bar =0.062028853485800256

Phi_c =0.47515878165732867

Chi_c =1.056801566467146

Column number 11

A_sl=8186.06, A_sl_eff=8186.06, I_sl=3644157.6

sigma_cr_c=92265.81

e1=39.57, e2=25.87

All tension =False

Buckling Values 11

beta_A_c =1.0

lambda_c_bar =0.062028853485800256

Phi_c =0.47515878165732867

Chi_c =1.056801566467146

Column number 12

A_sl=8186.06, A_sl_eff=8186.06, I_sl=3644157.6

sigma_cr_c=92265.81

e1=39.57, e2=25.87

All tension =False

Buckling Values 12

beta_A_c =1.0

lambda_c_bar =0.062028853485800256

Phi_c =0.47515878165732867

Chi_c =1.056801566467146

Column number 13

A_sl=8761.06, A_sl_eff=8449.54, I_sl=3648949.27

sigma_cr_c=86323.65

e1=41.27, e2=24.17

All tension =False

Buckling Values 13

beta_A_c =0.9644423730621263

lambda_c_bar =0.06297778905251687

Phi_c =0.4756405993995462

Chi_c =1.0558620313003602

Critical buckling values

Chi_c: 1.0558620313003597

sigma_cr_c: 86323.6541824603

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0558620313003597

Side 4

4.5.2 Plate type behaviour

sigma_cr = 418.86006419015877

Lambda: 0.7515907228490232

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 14

A_sl=12926.75, A_sl_eff=12537.6, I_sl=4595526.08

sigma_cr_c=73682.54

e1=49.48, e2=24.12

All tension =False

Buckling Values 14

beta_A_c =0.9698957713255715

lambda_c_bar =0.06835879648743347

Phi_c =0.47770039043157153

Chi_c =1.0520950998095686

Critical buckling values

Chi_c: 1.0520950998095686

sigma_cr_c: 73682.54243437978

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0520950998095686

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 948.2775028105996

eta_3: 0.0178377893690746

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

stiffened plate; EBPlate

k_tau: 13.585740131578945

eta_3: 0.1417611657131752

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: 382.6053306420087

eta_3: 0.018621187727664325

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: 0.02837736914547318

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.021693896103489152

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.01627042207761686

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.010846948051744576

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.005423474025872288

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.0010956513183580379

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.005423474025872288

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.010846948051744576

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.36175625

eta_3: 0.016270422077761686

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.35

eta_3: 0.021693896103489152

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.382025

eta_3: 0.02837736914547318

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: 13.585740131578952

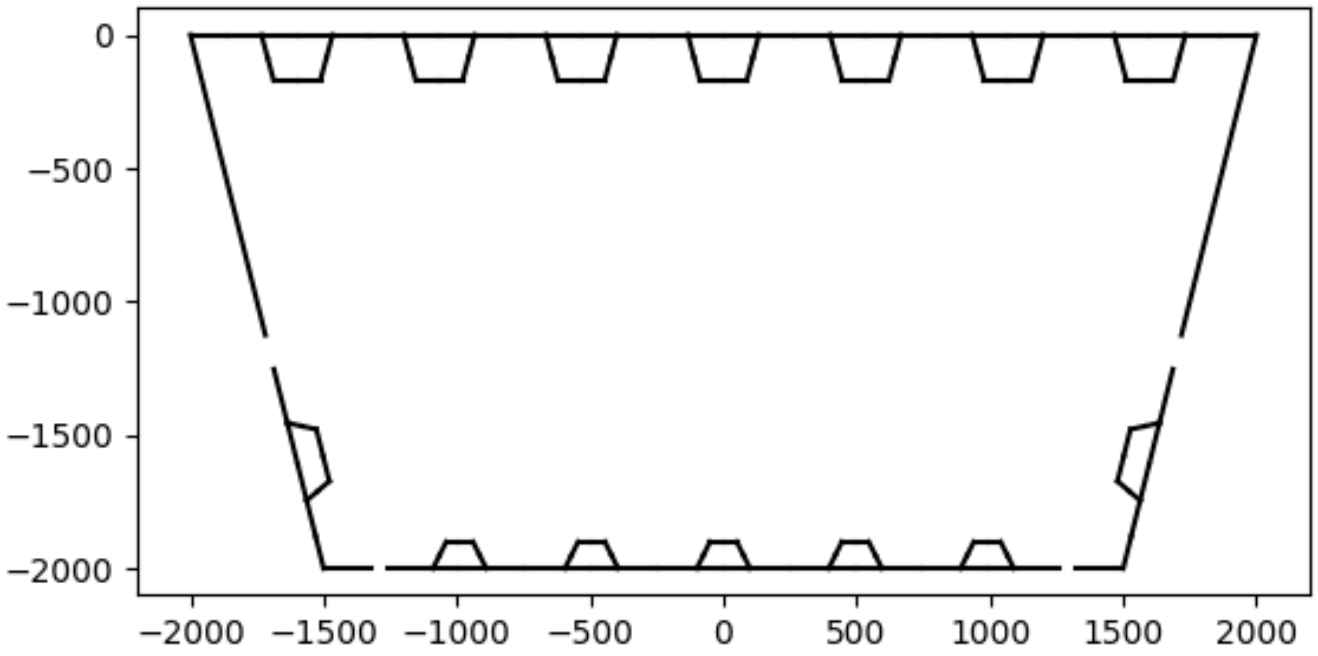
eta_3: 0.1417611657131752

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


0
−500
−1000
−1500
−2000
−2000
−1500
−1000
−500
0
500
1000
1500
2000