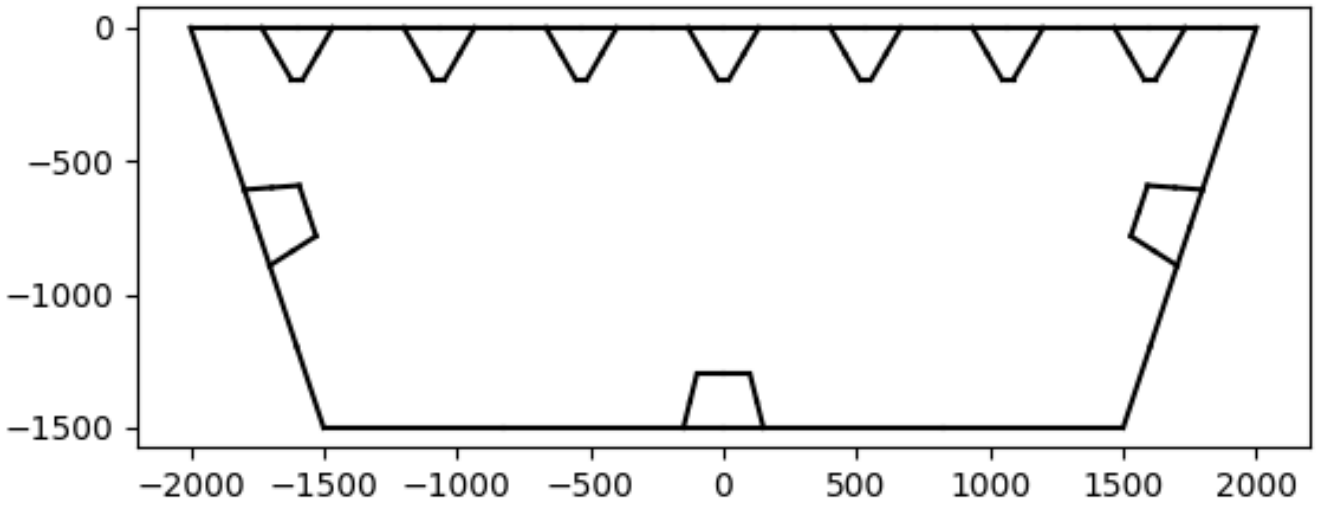
CS Analysis Tool



CONSTANTS

E: 210000

nu: 0.3

f_y: 235

G: 81000

gamma_M1: 1.05

INPUT DATA

b_sup: 4000

CS Analysis Tool

t_deck: 5

b_inf: 3000

t_bottom: 5

h: 1500

t_side: 5

a: 10000

L_e: 15000

bending type: sagging bending

cs position: neither

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

Beta: 0.6161387625504372

Shear lag reduction for flange 3

Shear Lag is not neglectable

Beta: 0.9173257837904699

4.4 Plate elements without longitudinal stiffeners

Iteratively changing the widths until M_Rd_el_eff converges to a limit of 0.005

4.5 Stiffened plate elements with longitudinal stiffeners

Side 2

4.5.2 Plate type behaviour

sigma_cr = 5124.082221497298

Lambda: 0.1832298453092058

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 8

A_sl=6846.73, A_sl_eff=5877.73, I_sl=13615748.13

sigma_cr_c=412170.52

e1=73.34, e2=59.32

All tension =False

Buckling Values 8

beta_A_c =0.8584724015842313

lambda_c_bar =0.022123744423738656

Phi_c =0.4651388293645379

Chi_c =1.0755565381154082

Critical buckling values

Chi_c: 1.0755565381154082

sigma_cr_c: 412170.52797394566

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0755565381154082

Side 3

4.5.2 Plate type behaviour

sigma_cr = 372.38017999795767

Lambda: 0.5548580478713641

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 9

A_sl=11311.55, A_sl_eff=5518.29, I_sl=13625049.83

sigma_cr_c=249651.92

e1=96.75, e2=35.9

All tension =False

Buckling Values 9

beta_A_c =0.48784569221598767

lambda_c_bar =0.02142928655464255

Phi_c =0.4669902232800209

Chi_c =1.0712504611120048

Critical buckling values

Chi_c: 1.0712504611120048

sigma_cr_c: 249651.9209402946

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0712504611120048

Side 4

4.5.2 Plate type behaviour

sigma_cr = 3081.582298338016

Lambda: 0.23627478384308065

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 10

A_sl=6846.73, A_sl_eff=5877.73, I_sl=13615748.13

sigma_cr_c=412170.52

e1=73.34, e2=59.32

All tension =False

Buckling Values 10

beta_A_c =0.8584724015842313

lambda_c_bar =0.022123744423738656

Phi_c =0.4651388293645378

Chi_c =1.0755565381154082

Critical buckling values

Chi_c: 1.0755565381154082

sigma_cr_c: 412170.5279739457

4.5.4 Interaction between plate and column buckling

all_tension: False

rho_c = 1.0755565381154082

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

5. Resistance to shear

stiffened plate; EBPlate

k_tau: 9487.522589138234

eta_3: 0.01570734171978963

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: 41.426315789473676

eta_3: 0.0816291510727169

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: 35.49886177282086

eta_3: 0.06486794273746313

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: 5.795625

eta_3: 0.07289806485816812

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.3625

eta_3: 0.0018349196792190317

eta_3_panel < 1: pass subpanel

5. Resistance to shear

unstiffened plate; (A.5)

k_tau: 5.795625

eta_3: 0.07289806485816812

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: 41.426315789473676

eta_3: 0.0816291510727169

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

CS Analysis Tool

Results:

EI: 3701005Nm^2

interaction side 2: -1

interaction side 3: -1

interaction side 4: -1

cost: 2193CHF/m