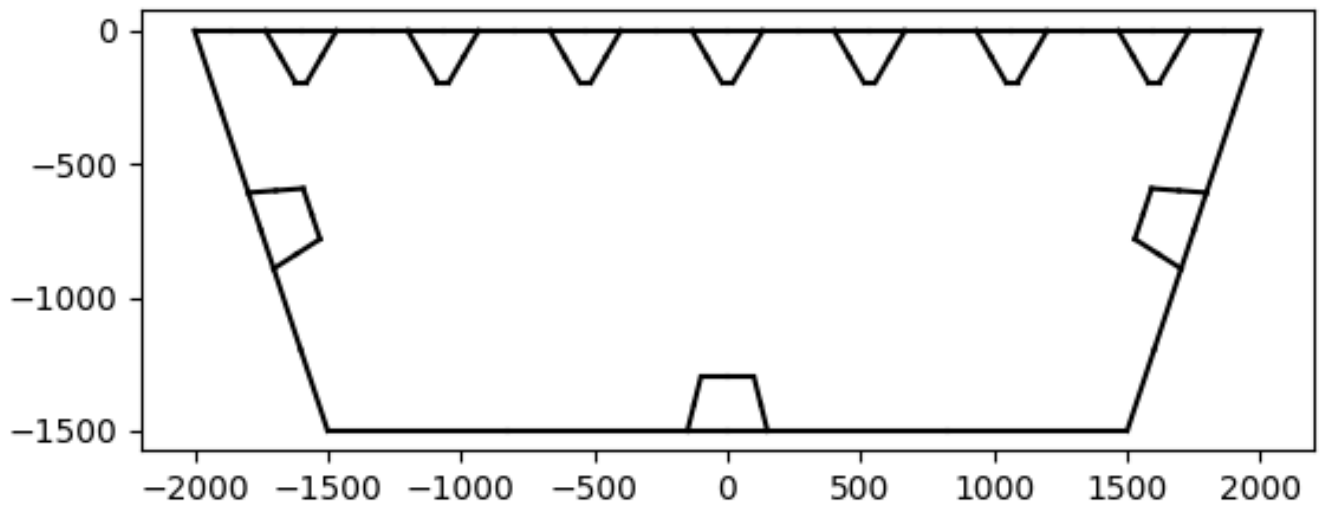


CS Analysis Tool



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

CS Analysis Tool

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

$A_{sl} = 6846.73$, $A_{sl_eff} = 5877.73$, $I_{sl} = 13615748.13$

$\sigma_{cr_c} = 412170.52$

$e_1 = 73.34$, $e_2 = 59.32$

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

χ_c : 1.0755565381154082

σ_{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

CS Analysis Tool

$\sigma_{cr} = 372.38017999795767$

Lambda: 0.5548580478713641

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 9

$A_{sl}=11311.55$, $A_{sl_eff}=5518.29$, $I_{sl}=13625049.83$

$\sigma_{cr_c}=249651.92$

$e_1=96.75$, $e_2=35.9$

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

χ_c : 1.0712504611120048

σ_{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

CS Analysis Tool

Rho_Global: 1.0

4.5.3 Column type buckling behaviour

Column number 10

$A_{sl}=6846.73$, $A_{sl_eff}=5877.73$, $I_{sl}=13615748.13$

$\sigma_{cr_c}=412170.52$

$e_1=73.34$, $e_2=59.32$

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

χ_c : 1.0755565381154082

σ_{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_{τ} : 9487.522589138234

η_3 : 0.01570734171978963

CS Analysis Tool

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

CS Analysis Tool

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: 3701005Nm²

interaction side 2: -1

interaction side 3: -1

interaction side 4: -1

cost: 2193CHF/m

