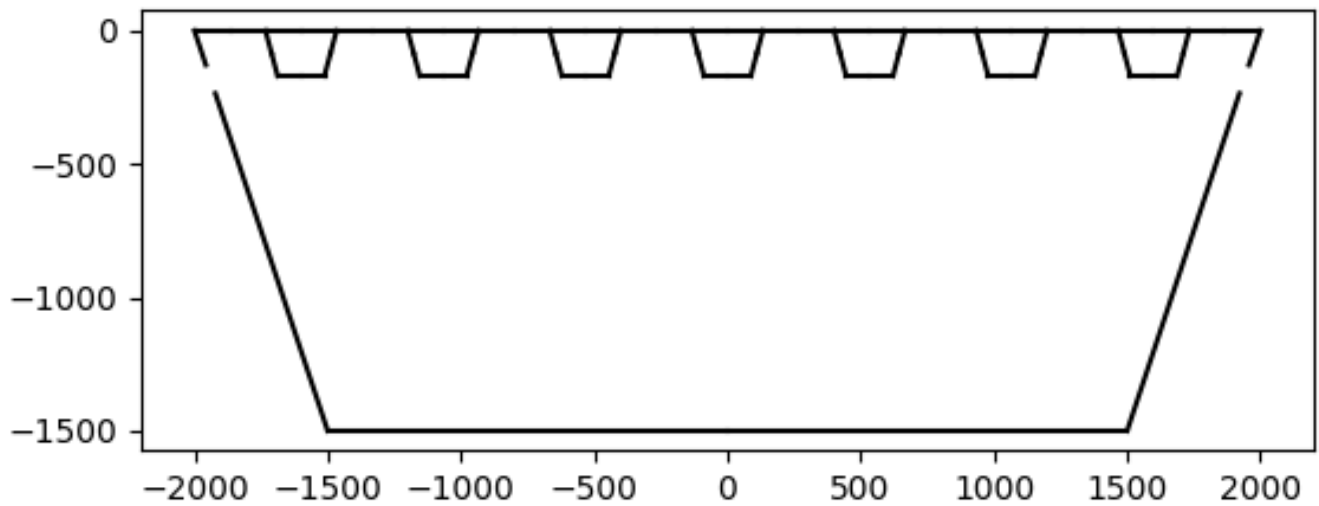


## CS Analysis Tool



### CONSTANTS

E: 210000

nu: 0.3

f<sub>y</sub>: 235

G: 81000

gamma<sub>M1</sub>: 1.05

### INPUT DATA

b<sub>sup</sub>: 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: 0.6345317205957003

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

## 4.5.4 Interaction between plate and column buckling

all\_tension: False

rho\_c = 1

Side 3

## 4.5.2 Plate type behaviour

sigma\_cr = 372.25502000000006

Lambda: 0.5549513175280283

Rho\_Global: 1.0

## 4.5.3 Column type buckling behaviour

Column number 8

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 8

beta\_A\_c =0.4878456922159876

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

# CS Analysis Tool

all\_tension: False

$\rho_c = 1.0712504611120048$

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

## 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)

$k_{\tau} = 5.965$

$\eta_3 = 0.00021511872325957862$

## 7.1 Interaction between shear force, bending moment and axial force

Web -> (7.1) without iterating

$\eta_3 \leq 0.5$ ; no interaction needed

utilisation: -1

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

## 5. Resistance to shear

# CS Analysis Tool

## 7.1 Interaction between shear force, bending moment and axial force

Flange -> (7.1), comment (5)

$\eta_3 > 0.5$ ; interaction needed

$\eta_1$ : 4.2002242955507585e-08

utilisation: 1.000000042002243

Proofing Resistance to shear for each subpanel

### 5. Resistance to shear

unstiffened plate; (A.5)

$k_\tau$ : 5.795625

$\eta_3$ : 7.482115742394911e-05

$\eta_{3\_panel} < 1$ : pass subpanel

### 5. Resistance to shear

unstiffened plate; (A.5)

$k_\tau$ : 5.3625

$\eta_3$ : 1.8833259078449485e-06

$\eta_{3\_panel} < 1$ : pass subpanel

### 5. Resistance to shear

unstiffened plate; (A.5)

$k_\tau$ : 5.795625

$\eta_3$ : 7.482115742394911e-05

$\eta_{3\_panel} < 1$ : pass subpanel

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

### 5. Resistance to shear

## CS Analysis Tool

unstiffened plate; (A.5)

$k_{\tau}$ : 5.965

$\eta_3$ : 0.00021511872325957862

7.1 Interaction between shear force, bending moment and axial force

Web -> (7.1) without iterating

$\eta_3 \leq 0.5$ ; no interaction needed

utilisation: -1

### Results:

EI: 3050998Nm<sup>2</sup>

interaction side 2: -1

interaction side 3: 1.000000042002243

interaction side 4: -1

cost: 1913CHF/m

## CS Analysis Tool

