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Buckling Proof according to EC 1993 Part 1-5

3.2 Effective width for elastic shear lag

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

4.5.4 Interaction between plate and column buckling

all_tension: False

$rho\_c = 1$

Side 3

4.5.4 Interaction between plate and column buckling

all_tension: True

$rho\_c = 1$

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 <= 0.5; no interaction needed

   utilisation: -1

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

5. Resistance to shear

   unstiffened plate; (A.5)

   k_tau: 7.59

   eta_3: 0.00014738990605927716

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: 7.59

   eta_3: 0.00014738990605927716

   eta_3_panel < 1: pass subpanel

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

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 <= 0.5; no interaction needed

utilisation: -1

Results:

EI: 6214024Nm^2

interaction side 2: -1

interaction side 3: -1

interaction side 4: -1

cost: 1797CHF/m