a. Effective Plate Width (s^e)

The effective plate width for a continuous stiffener subjected to longitudinal and transverse stress and shear is calculated as follows:

$$\frac{s_e}{s} = C_{xs} C_{ys}$$

$$C_{xs} = \frac{\bar{\lambda}_p - 0.22}{\bar{\lambda}_p^2}, \quad \text{if } \bar{\lambda}_p > 0.673$$
$$= 1.0, \quad \text{if } \bar{\lambda}_p \le 0.673$$

$$\bar{\lambda}_p = 0.525 \frac{s}{t}\sqrt{\frac{f_y}{E}}$$

$$C_{ys} = \sqrt{1 - \left(\frac{\sigma_{y,Sd}}{\sigma_{y,R}}\right)^2 + c_i \left(\frac{\sigma_{x,Sd} \cdot \sigma_{y,Sd}}{C_{xs} \cdot f_y \cdot \sigma_{y,R}}\right)}$$

$$\sigma_{y,R} = \left[\frac{1.3 \cdot t}{l}\sqrt{\frac{E}{f_y}} + \kappa\left(1 - \frac{1.3 \cdot t}{l}\sqrt{\frac{E}{f_y}}\right)\right] \cdot f_y \cdot k_p$$

CEK-A

$$k_p = 1.0 \quad \text{for} \quad p_{Sd} \le 2 \cdot \left(\frac{t}{s}\right)^2 \cdot f_y$$

otherwise

$$k_p = 1.0 - h_\alpha \left(\frac{p_{Sd}}{f_y} - 2 \cdot \left(\frac{t}{s}\right)^2\right), \quad \text{but } k_p \ge 0$$

$$h_\alpha = 0.05 \cdot \frac{s}{t} - 0.75 \quad \text{but } h_\alpha \ge 0$$

$$c_i = 1 - \frac{s}{120 \cdot t} \quad \text{for } \frac{s}{t} \le 120$$
$$c_i = 0 \quad \text{for } \frac{s}{t} > 120$$

1. $\kappa = 1.0$ for $\lambda_c \le 0.2$
2. $\kappa = \frac{1}{2 \cdot \bar{\lambda}_c^2}\left(1 + \mu + \bar{\lambda}_c^2 - \sqrt{(1 + \mu + \bar{\lambda}_c^2)^2 - 4 \cdot \bar{\lambda}_c^2}\right)$ for $0.2 < \lambda_c < 2.0$
3. $\kappa = \frac{1}{2 \cdot \bar{\lambda}_c^2} + 0.07$ for $\lambda_c \ge 2.0$

$$\mu = 0.21 \cdot (\bar{\lambda}_c - 0.2)$$

$$\bar{\lambda}_c = 1.1 \cdot \frac{s}{t} \cdot \sqrt{\frac{f_y}{E}}$$

Note:

(yellow)	Known values
(white)	Calculated values
(orange)	Final results

Known values:

			Where:
l	4000	mm	plate length or stiffener length
s	1000	mm	plate width, stiffener spacing.
t	20	mm	plate thickness
ρ_w	1025.00	kg/m^3	water density
g	9.81	m/s^2	gravity acceleration
d	15.00	m	hydrostatic pressure depth
fy	300.00	MPa	characteristic yield strength
E	200.00	Gpa	Young modulus of elasticity

Loadings:

			Where:
$\sigma_{x,Sd}$	180.00	MPa	axial stress in plate and stiffener with compressive stresses as positive
$\sigma_{y,Sd}$	50.00	MPa	transverse stress in plate and stiffener
p_{Sd}	150828.75	Pa=N/m^2	design lateral force, for this case is the hydrostatic pressure at d
p_{Sd}	0.15	MPa	

Reduced plate slenderness:

			Where:
$\bar{\lambda}_p$	1.017	[]	reduced plate slenderness in longitudinal direction
$\bar{\lambda}_c$	2.130	[]	reduced plate slenderness in transverse direction

Since $\bar{\lambda}_p$ > 0.673, then: C_{xs}= 0.771 []

where: C_{xs} is reduction factor due to stresses in the longitudinal direction

Note:

Therefore: s/t 50.00 []

c_i 0.583 []

The reduction factor due to lateral load, k_p:

CEK-A 0.24 MPa; it means p_{Sd} <= CEK-A

Thus k_p 1.000 []

otherwise, since h_α 1.750 [], then k_p= 1.00052 []

Since, μ 0.405 [], and $\bar{\lambda}_c$ 2.130 [], then parameter κ: can be found as follows:

(1) κ 1.000 [] for $\lambda_c \le 0.2$

(2) κ 0.198 [] for $0.2 < \lambda_c < 2.0$

(3) κ 0.180 [] for $\lambda_c \ge 2.0$

Conclusion: κ 0.180 []

Thus, the plate buckling resistance $\sigma_{y,R}$ 95.33 MPa

→ Now, we can calculate the reduction factor due to stresses in transverse direction, C_{ys} = 0.981 []

Finally: the effective plate width, S_e, is 756.41 mm

Hint:
See Section 7.3
DNV-RP-C201

b. Equivalent axial (N_{Sd}) and lateral (q_{Sd}) loads

The equivalent **axial force** should be taken as:

$$N_{Sd} = \sigma_{x,Sd}(A_s + st) + \tau_{tf} st$$

$$\tau_{tf} = \tau_{Sd} - \tau_{crg} \quad \text{for } \tau_{Sd} > \frac{\tau_{crl}}{\gamma_M} \text{ and tension field action is allowed}$$

$$\tau_{tf} = 0 \quad \text{otherwise}$$

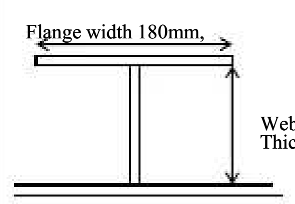
$$\tau_{crl} = k_l \cdot 0.904 \cdot E \cdot \left(\frac{t}{s}\right)^2$$

$$\tau_{crg} = k_g \cdot 0.904 \cdot E \cdot \left(\frac{t}{l}\right)^2$$

$$k_l = 5.34 + 4\left(\frac{s}{l}\right)^2, \text{for } l \ge s$$
$$= 5.34\left(\frac{s}{l}\right)^2 + 4, \text{for } l < s$$

$$k_g = 5.34 + 4\left(\frac{l}{L_G}\right)^2, \quad \text{for } l \le L_G$$
$$= 5.34\left(\frac{l}{L_G}\right)^2 + 4, \quad \text{for } l > L_G$$

Stiffener cross section:



Known values from previous page

l	4000	mm	plate length or stiffener length
s	1000	mm	plate width, stiffener spacing.
t	20	mm	plate thickness
E	200.00	Gpa	Young modulus of elasticity
$\sigma_{x,Sd}$	180.00	MPa	axial stress in plate and stiffener with compressive stresses as positive

Known values:

L_G	3000	mm	girder length
w_{fl}	180	mm	flange width
t_{fl}	20	mm	flange thickness
h_w	400	mm	web height
t_w	10	mm	web thickness
τ_{Sd}	0.00	MPa	design shear stress
γ_M	1.15	[]	resulting material factor

Since k_l >= s, then k_l= 5.59 [], where k_l is buckling factor for plate between stiffeners.

Since k_g > L_G, then k_g 13.49 [], where k_G is buckling factor for plate with the stiffeners removed.

Thus:

τ_{crl}	404.27	MPa
τ_{crg}	60.99	MPa

Since τ_{Sd} <= $\dfrac{\tau_{crl}}{\gamma_M}$ then: τ_{tf} = 0.00 MPa

The cross sectional area of stiffener is A_s 7600 mm^2;

and the full plate cross section area **s.t** = 20000 mm^2

Therefore, the equivalent axial force, N_{Sd} **4.968** **MN**

Note:

(light yellow)	Known values from previous page
(yellow)	Known values
(white)	Calculated values
(orange)	Final results

Hint:
See Section 7.2
DNV-RP-C201

The equivalent **lateral line load** should be taken as:

$$q_{Sd} = (p_{Sd} + p_0)s$$

$$p_0 = (0.6 + 0.4\psi)\, C_0 \sigma_{y1Sd} \quad \text{if} \quad \psi > -1.5$$

$$p_0 = 0 \quad \text{if} \quad \psi \le -1.5$$

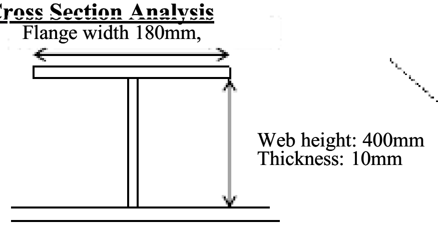
$$\psi = \frac{\sigma_{y2.Sd}}{\sigma_{y1.Sd}}$$

$$C_0 = \frac{W_{es} \cdot f_y \cdot m_c}{k_c \cdot E \cdot t^2 \cdot s}$$

$$k_c = 2 \cdot \left(1 + \sqrt{1 + \frac{10.9 \cdot I_s}{t^3 \cdot s}}\right)$$

Wes and Is are determined by cross section analysis

Cross Section Analysis



Known values from previous page

t	20	mm	plate thickness
s	1000	mm	plate width, stiffener spacing.
Se	756.41	mm	the effective plate width

p_{Sd}	0.1508	MPa
f_y	300.00	MPa

Section properties:

			Where:
A_{fl}	3600	mm^2	flange cross section area
A_w	4000	mm^2	web cross section area
A_p	20000	mm^2	plate cross section area, use s.
A_{pes}	15128	mm^2	plate cross section area, use S_e.
z_{fl}	430	mm	flange COG, counted from base
z^w	220	mm	web COG, counted from base
z_p	10	mm	plate COG, counted from base
COG	95.22	mm	COG of stiffener + plate, use s.
d_{fl-es}	316.52	mm	distance of z_{fl} and COG_{es}
d_{w-es}	106.52	mm	distance of d_w and COG_{es}
d_{pes}	-103.48	mm	distance of d_p and COG_{pes}
c_{es}	344.78	mm	distance from COG_{es} to the outer fiber

Section properties:

			Where:
I_{fl}	120000	mm^4	flange cross section moment of inertia
I_w	53333333	mm^4	web cross section moment of inertia
I_p	666667	mm^4	plate cross section moment of inertia, use s.
I_{pes}	504271	mm^4	plate cross section moment of inertia, use S_e.
d_{fl}	334.78	mm	distance of z_{fl} and COG
d^w	124.78	mm	distance of d^w and COG
d_p	-85.22	mm	distance of d_p and COG
I_s	665128696	mm^4	moment of inertia of stiffener with full plate width
z_{pes}	10	mm	effective plate COG, counted from base
COG_{es}	113.48	mm	COG of stiffener + plate, use S_e.
I_{es}	622003068	mm^4	moment of inertia of stiffener with effective plate width
W_{es}	1804044	mm^3	section modulus for stiffener with effective plate at flange tip

Then, the factor k_c an C_0 is determined as follows:

k^c	62.24	[]
C_0	0.001446	[]
Ψ	1.00	[]
p_0	0.0723	MPa

Finally, the equivalent lateral line load, q_{Sd}

q_{Sd}	**223.11**	**N/mm**

Known values:

m^c	13.3	[]
$\sigma_{y1,Sd}$	50.00	MPa
$\sigma_{y2,Sd}$	50.00	MPa

Note:

m^c = 13.3 for continuous stiffeners or,
= 8.9 for simple supported stiffeners (sniped stiffeners)

Where:

$\sigma_{y1,Sd}$ larger design stress in the transverse direction, with tensile stresses taken as negative

$\sigma_{y2,Sd}$ smaller design stress in the transverse direction, with tensile stresses taken as negative

c.1. Torsional buckling strength of stiffeners

The torsional buckling strength may be calculated as:

$$\frac{f_T}{f_y} = 1.0 \qquad \text{when } \bar{\lambda}_T \le 0.6$$

$$\frac{f_T}{f_y} = \frac{1+\mu+\bar{\lambda}_T^2 - \sqrt{\left(1+\mu+\bar{\lambda}_T^2\right)^2 - 4\bar{\lambda}_T^2}}{2\bar{\lambda}_T^2} \qquad \text{when } \bar{\lambda}_T > 0.6$$

$$\mu = 0.35\left(\bar{\lambda}_T - 0.6\right)$$

$$\bar{\lambda}_T = \sqrt{\frac{f_y}{f_{ET}}}$$

For L- and T-stiffeners f_{ET} :

$$f_{ET} = \beta \frac{A_w + \left(\frac{t_f}{t_w}\right)^2 A_f}{A_w + 3A_f} G \left(\frac{t_w}{h_w}\right)^2 + \frac{\pi^2 E I_z}{\left(\frac{A_w}{3} + A_f\right) l_T^2}$$

$$I_z = \frac{1}{12} A_f b^2 + e_f^2 \frac{A_f}{1 + \frac{A_f}{A_w}}$$

f_{ET-1}

f_{ET-2}

For flatbar stiffeners f_{ET} :

$$f_{ET} = \left[\beta + 2\left(\frac{h_w}{l_T}\right)^2\right] G \left(\frac{t_w}{h_w}\right)^2$$

$$\beta = \frac{3C + 0.2}{C + 0.2}$$

$$\sigma_{j,Sd} = \sqrt{\sigma_{x,Sd}^2 + \sigma_{y,Sd}^2 - \sigma_{x,Sd}\sigma_{y,Sd} + 3\tau_{Sd}^2}$$

$$C = \frac{h_w}{s}\left(\frac{t}{t_w}\right)^3 \sqrt{(1-\eta)}$$

$$\eta = \frac{\sigma_{j,Sd}}{f_{ep}} \qquad \eta \le 1.0$$

$$f_{ep} = \frac{f_y}{\sqrt{1+\bar{\lambda}_e^4}}$$

$$c = 2 - \frac{s}{l}$$

$$\bar{\lambda}_e^2 = \frac{f_y}{\sigma_{j,Sd}}\left(\left(\frac{\sigma_{x,Sd}}{f_{Epx}}\right)^c + \left(\frac{\sigma_{y,Sd}}{f_{Epy}}\right)^c + \left(\frac{\tau_{Sd}}{f_{Ep\tau}}\right)^c\right)^{\frac{1}{c}}$$

$$f_{Epx} = 3.62E\left(\frac{t}{s}\right)^2 \qquad f_{Epy} = 0.9E\left(\frac{t}{s}\right)^2 \qquad f_{Ep\tau} = 5.0E\left(\frac{t}{s}\right)^2$$

Known values from previous page

l	4000	mm	plate length or stiffener length.
s	1000	mm	plate width, stiffener spacing.
t	20	mm	plate thickness
E	200	Gpa	Young modulus of elasticity
$\sigma_{x,Sd}$	180	MPa	axial stress in plate and stiffener
$\sigma_{y,Sd}$	50	MPa	transverse stress in plate and stiffener
τ_{Sd}	0	MPa	design shear stress
w_{fl}	180	mm	flange width = b
t_{fl}	20	mm	flange thickness
h_w	400	mm	web height
t_w	10	mm	web thickness
f_y	300	MPa	characteristic yield strength

Thus:

c = 1.75 []

Thus:

$\sigma_{j,Sd}$ = 160.93 MPa

Where:

$\sigma_{j,Sd}$ is design von Mises's equivalent stress

Euler buckling strength

f_{Epx}	289.60	MPa	Euler buckling strength for plate due to longitudinal stresses
f_{Epy}	72.00	MPa	Euler buckling strength for plate due to transverse stresses
$f_{Ep\tau}$	400.00	MPa	Euler buckling shear strength for plate

Reduced equivalent slenderness

$\bar{\lambda}_e^2$ = 1.825 []

~~Therefore:~~

f_{ep} ~~144.17~~ MPa

η 1.12 []

C ~~0.00~~ []

β 1.0 []

Hint:
See Section 7.5.2
DNV-RP-C201

Known values from previous page

v	0.3	[]	Poisson's ratio
G	76923.077	MPa	shear modulus
A_w	4000	mm^2	web cross section area
A_{fl}	3600	mm^2	flange cross section area
$b=w_{fl}$	180	mm	flange width = b
e_f	0	mm	flange eccentricity

Thus:

I_z 9720000 mm^4

(moment of inertia of the stiffeners neutral axis normal to the plane of the plate)

Torsional elastic buckling strength (f_{ET})

l_T	f_{ET-1}	f_{ET-2}	f_{ET}	$\bar{\lambda}_T$	μ	f_T (MPa)
0.8*1	0.0	303.8	303.8	0.994	0.138	208.48
0.4*1	0.0	1519.2	1519.2	0.444	-0.054	300.00

c.2.Characteristic buckling strength

$$\frac{f_k}{f_r}=1 \quad \text{when } \bar{\lambda}\le 0.2$$

$$\bar{\lambda}=\sqrt{\frac{f_r}{f_E}}$$

where: $f_r=f_y$ for check at plate side.
$f_r=f_y$ for check at stiffener side if $\bar{\lambda}_T \le 0.6$
$f_r=f_T$ for check at stiffener side if $\bar{\lambda}_T > 0.6$

$$f_E=\pi^2 E\left(\frac{i_e}{l_k}\right)^2$$

$$i_e=\sqrt{\frac{I_e}{A_e}}$$

W=min(Wep,Wes)

$$W_{es}=\frac{I_e}{z_t}$$

$$\frac{f_k}{f_r}=\frac{1+\mu+\bar{\lambda}^2-\sqrt{(1+\mu+\bar{\lambda}^2)^2-4\bar{\lambda}^2}}{2\bar{\lambda}^2} \quad \text{when } \bar{\lambda}>0.2$$

$$l_k=l\left(1-0.5\left|\frac{p_{Sd}}{p_f}\right|\right)$$

$$p_f=\frac{12W}{l^2\cdot s}\frac{f_y}{\gamma_M}$$

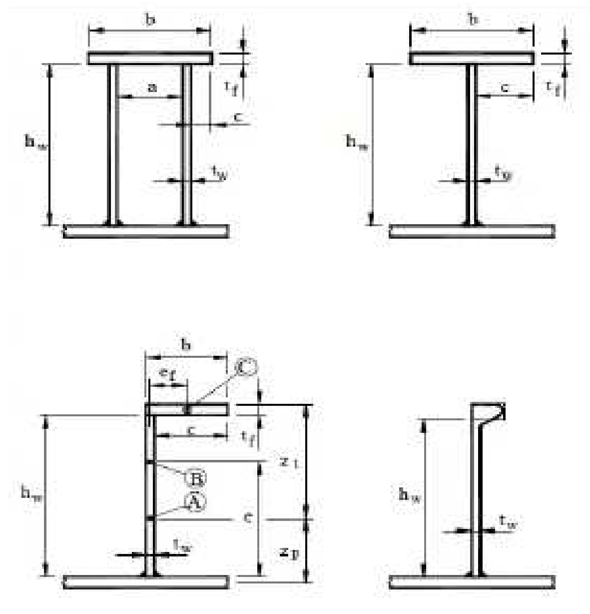
$$W_{ep}=\frac{I_e}{z_p}$$

for check at plate side

$$\mu=\left(0.34+0.08\frac{z_t}{i_e}\right)(\bar{\lambda}-0.2)$$

for check at stiffener side

$$\mu=\left(0.34+0.08\frac{z_p}{i_e}\right)(\bar{\lambda}-0.2)$$



A = centroid of stiffener with effective plate flange.
B = centroid of stiffener exclusive of any plate flange.
C = centroid of flange.

Figure 7-3 Cross-sectional parameters for stiffeners and girders

Known values from previous page

COG	95.22	mm	
I_{es}	622003068	mm^4	moment of inertia of stiffener with effective plate width
f_y	300.00	MPa	characteristic yield strength
γ_M	1.15	[]	resulting material factor
l	4000	mm	plate length or stiffener length
s	1000	mm	plate width, stiffener spacing.
A_{pes}	15128	mm^2	COG of stiffener + plate, use s.
p_{Sd}	0.15	MPa	design lateral pressure

Calculated values

z_p	85.22	mm	see Figure 7-3
z_t	354.78	mm	see Figure 7-3
W_{ep}	7299016	mm^3	effective elastic section modulus on plate side
W_{es}	1753195	mm^3	effective elastic section modulus on stiffener side
W	1753195	mm^3	elastic section modulus
p_f	0.34	MPa	lateral pressure giving yield in outer-fibre at support.
l_k	3120.57	mm	buckling length
i_e	202.77	mm	effective radius of gyration
f_E	8334.28	MPa	Euler buckling strength

The characteristic buckling strength for check at plate side

f_r	300	MPa	characteristic strength
$\bar{\lambda}$	0.190	[]	
μ	-0.005	[]	
f_k	**300**	**MPa**	characteristic buckling strength

The characteristic buckling strength for check at stiffener side

f_r	208	MPa	characteristic strength
$\bar{\lambda}$	0.158	[]	
μ	-0.016	[]	
f_k	**208**	**MPa**	characteristic buckling strength

c.3. Shear Stress Resistance

The resistance towards shear stresses τ_{Rd} is found as the minimum of τ_{Rdy}, τ_{Rdl} and τ_{Rds} according to the following:

$$\tau_{Rdy} = \frac{f_y}{\sqrt{3} \cdot \gamma_M}$$

$$\tau_{Rdl} = \frac{\tau_{crl}}{\gamma_M}$$

$$\tau_{Rds} = \frac{\tau_{crs}}{\gamma_M}$$

$$\tau_{crs} = \frac{36 \cdot E}{s \cdot t \cdot l^2} \cdot \sqrt[4]{I_p \cdot I_s^3}$$

$$I_p = \frac{t^3 \cdot s}{10.9}$$

Known values from previous page

			where:
f_y	300.00	MPa	characteristic yield strength
γ_M	1.15	[]	resulting material factor
s	1000	mm	plate width, stiffener spacing.
t	20	mm	plate thickness
I_s	665128696	mm^4	moment of inertia of stiffener with full plate width.
E	200.00	Gpa	Young modulus of elasticity
l	4000	mm	span length
τ_{crl}	404.27	MPa	critical shear stress

Calculated values

τ_{crs}	2727.58	MPa	critical shear stress
I_p	733945	mm^4	

Therefore:

τ_{Rdy}	150.61	MPa
τ_{Rdl}	351.54	MPa
τ_{Rds}	2371.81	MPa

Thus:

τ_{Rd}	**150.61**	**MPa**	design resistance shear stress

Hint:
See Section 7.6
DNV-RP-C201

c.4. The following resistance parameters are used in the interaction equations:

$$N_{Rd} = A_e \frac{f_y}{\gamma_M}$$

$$N_{ks,Rd} = A_e \frac{f_k}{\gamma_M}$$

$$N_{kp,Rd} = A_e \frac{f_k}{\gamma_M}$$

$$M_{s1,Rd} = W_{es} \frac{f_r}{\gamma_M}$$

$$M_{s2,Rd} = W_{es} \frac{f_r}{\gamma_M}$$

$$M_{st,Rd} = W_{es} \frac{f_y}{\gamma_M}$$

$$M_{p,Rd} = W_{ep} \frac{f_y}{\gamma_M}$$

$$N_E = \frac{\pi^2 E A_e}{\left(\frac{l_k}{i_e}\right)^2}$$

Known values from previous page

f_y	300	MPa	characteristic yield strength
γ_M	1.15	[]	resulting material factor
A_{fl}	3600	mm^2	
A_w	4000	mm^2	
A_{pes}	15128	mm^2	
l_k	3121	mm	
i_e	202.77	mm	
E	200.00	Gpa	

Thus: A_e 22728 mm^2

Where A_e is effective area of stiffener and plate

Thus: N_E **189.423** MN

Thus: → N_{Rd} **5.93** MN

Hint:
See Section 7.7.3
DNV-RP-C201

~~**For plate:**~~

f_k	300	MPa	characteristic buckling strength
W_{ep}	7299016	mm^3	effective elastic section modulus on plate side

Thus: → $N_{kp,Rd}$ **5.93** MN

For stiffener:

f_k	208	MPa	characteristic buckling strength
W_{es}	1753195	mm^3	effective elastic section modulus on stiffener side

Thus: → $N_{ks,Rd}$ **4.12** MN

For:	Then:			Thus:					
l_T=0.4*l →	f_r=f_y	300.00	MPa →	$M_{s1,Rd}$	**457.36**	MN.mm	$M_{st,Rd}$	**457.36**	MN.mm
l_T=0.8*l →	f_r=f_T	208.48	MPa →	$M_{s2,Rd}$	**317.83**	MN.mm	$M_{p,Rd}$	**1904.09**	MN.mm

$$M_{1,Sd} = \frac{q_{Sd} l^2}{12}$$

$$M_{2,Sd} = \frac{q_{Sd} l^2}{24}$$

$$u = \left(\frac{\tau_{Sd}}{\tau_{Rd}}\right)^2$$

Since:

q_{sd}	223.110	N/mm
l	4000	mm

Then:

$M_{1,Sd}$	**297.480**	MN.mm
$M_{2,Sd}$	**148.740**	MN.mm

Because:

τ_{Sd}	0.00	MPa
τ_{Rd}	150.61	MPa

Then:

u **0.00** []

Where: q_{Sd} is the equivalent lateral line load.

e. Interaction formulas

For continuous stiffeners the following four interaction equations need to be fulfilled

Lateral pressure on plate side:

1
$$\frac{N_{Sd}}{N_{ks,Rd}} + \frac{M_{1,Sd} - N_{Sd} \cdot z^*}{M_{st,Rd}\left(1 - \frac{N_{Sd}}{N_E}\right)} + u \leq 1$$

2
$$\frac{N_{Sd}}{N_{kp,Rd}} - 2 \cdot \frac{N_{Sd}}{N_{Rd}} + \frac{M_{1,Sd} - N_{Sd} \cdot z^*}{M_{p,Rd}\left(1 - \frac{N_{Sd}}{N_E}\right)} + u \leq 1$$

3
$$\frac{N_{Sd}}{N_{ks,Rd}} - 2 \cdot \frac{N_{Sd}}{N_{Rd}} + \frac{M_{2,Sd} + N_{Sd} \cdot z^*}{M_{st,Rd}\left(1 - \frac{N_{Sd}}{N_E}\right)} + u \leq 1$$

4
$$\frac{N_{Sd}}{N_{kp,Rd}} + \frac{M_{2,Sd} + N_{Sd} \cdot z^*}{M_{p,Rd}\left(1 - \frac{N_{Sd}}{N_E}\right)} + u \leq 1$$

Known values from previous page

N_{Sd}	4.968	MN	the equivalent axial force

Assume:

z*	0	mm	the distance from the neutral axis of the effective sectionto the working point of the axial force

Finally:

				Thus:
EQ.1	**1.874**	>	1	**NOK!**
EQ.2	**-0.170**	<=	1	**OK**
EQ.3	**-0.504**	<=	1	**OK**
EQ.4	**0.918**	<=	1	**OK**

Conclusion

The plate panel cannot resist buckling.

The reason: We can see that the equivalen axial force is larger than the stiffener buckling load capacity.

Hint:
See Section 7.7.1
DNV-RP-C201