Carbon steel (EN 1993-1-1) versus Aluminium (EN 1999-1-1)

SUBJECT	CARBON STEEL	ALUMINIUM	USER-EDITABLE IN DIAMONDS?
Material properties - influence of welds (hazard zone) - n_p, for plastic analysis	**§3.2.3** - -	**§3.2.2** Yes Yes	No
- values of yield strength - value of tensile strength	f_y f_u	f_o f_u	Yes
Design values of material properties - density, ρ (kg/m³) - young modulus, E (N/mm²) - shear modulus, G (N/mm²) - poisson ratio, ν - coefficient thermal expansion, α (m/mK)	**§3.2.5** 7850 210 000 81 000 0.3 12×10^{-6}	**§3.2.5** 2 700 70 000 27 000 0.3 23×10^{-6}	Yes
Imperfections - Design values for initial local e_0/L	**§5.3.2, Table 5.1** a_0, a, b, c, d	**§5.3.2, Table 5.1** A, B	No, local imperfections are not taken into account in Diamonds
Partial safety factors - resistance of members and cross-sections - stability of members and cross-sections	**§6.1.3** $\gamma_{M0} = 1{,}0$ $\gamma_{M1} = 1{,}0$	**§6.1.3** $\gamma_{M1} = 1{,}1$ $\gamma_{M1} = 1{,}1$	Yes
Classification of sections - slenderness parameters (Table 6.2) - influence welding effects ρ_{HAZ}	**§5.6** Material + slenderness -	**§6.1.4** Material + slenderness Yes	No
Section Checks - general - yield criteria limit	**§6.2.1** 1	**§6.2.1** 1.2	No
Tension - $N_{t,Rd}$	**§6.2.3** effect of gross section, net section	**§6.2.3** effect of gross section, net section, haz	No
Compression - $N_{c,Rd}$	**§6.2.4** effect of gross section, effective section	**§6.2.4** effect of net section, effective section	No
Bending moment - M_{Rd}	**§6.2.5** $M_{u,Rd}$	**§6.2.5** max($M_{u,Rd}$; $M_{c,Rd}$), shape factor α	No
Shear - V_{Rd}	**§6.2.6** -	**§6.2.6** effect of haz	No
Bending and axial force - influence type of section	**§6.2.9** Section class	**§6.2.9** Open/closed, effect of haz	No

Buckling resistance - $N_{b,Rd}$ - buckling curves	**§6.3.1** - a_0, a, b, c, d	**§6.3.1** κ-factor for effect of haz A, B	No
Lateral buckling resistance - $M_{b,Rd}$ - imperfection factor for LTB	**§6.3.2** - a_0, a, b, c, d	**§6.3.2** shape factor α depending on Section Class	No
Lateral buckling & buckling - influence type of section - local axes effect	**§6.3.3** Section class -	**§6.3.3** Open/closed Omega factors	No