

Member Definition - Parameters - SS-EN 1993-1:2005/AC:2009

Member type: Beam

Buckling (y axis): Real Coefficient
 Member length y: 1.00
 Buckling length coeff. y: 1.00

Buckling (z axis): Real Coefficient
 Member length z: 1.00
 Buckling length coeff. z: 1.00

Buckling curve y: Sway auto
 Buckling curve z: Sway auto

Flexural-torsional buckling

Lateral buckling parameters:
 Lateral buckling
 Lateral buckling length coefficient: Lcr = lo Lcr = lo

Load level: Upper flange Lower flange
 Lateral buckling curve: auto

General method [6.3.2.2] Lambda LT,0 = 0.4
 Detailed method [6.3.2.3] Beta = 0.75
 Simplified method for beams with lateral restraints [6.3.2.4] kfl = 1.1

Additional sets of member parameters:
 Limit deflections and displacements: Service Note
 Complex sections: Complex
 Thin-walled sections: Thin-walled
 Fire analysis parameters: Fire Help

Member Definition - Additional Parameters

Load parameters
 Load type: My Mz

Section parameters
 Anet/Agross ratio: 1.00
 Shear parameter Eta: 1.00

Angles in tension [6.2.3.5]
 Connected by one bolt row
 Number of bolts n: 2
 Diameter of bolt openings d0: 10 mm
 Distances between bolts p1: 30 mm
 Distance between bolt and angle edge e2: 20 mm

Pipes
 Hot-rolled pipes

Yield strength:
 Basic f_yb
 Average f_ya = 235.00 MPa

Additional conditions for round pipes
 Pipes - unidirectional bending

Calculations - SS-EN 1993-1:2005/AC:2009

Verification options:
 Member verification: 1to3 List
 Code group verification: List
 Code group design: List
 Optimization: Options

My 10kNm
 Max=312.50
 Min= 0,0

Cases: 102 (Brottråns)

LTBeam - Default File

Beam/Section/Steel Lateral Restraints Loading Critical Moment

Critical Moment

Proceed

Dichotomic process on determinant
 Tolerance: 0,0001

Critical Factor
 N* Iteration 18 Current value 1,84219
 Convergence achieved
 H_{cr} 1,8422

Critical Moment
 M_{max} 308,25 kN.m
 xi 0,500
 M_{max cr} 567,86 kN.m

Deformed Shape

3D View Edit

Bending and Shear Diagrams

Refresh

M_{max} 308,25 kN.m
 xi 0,500

RESULTS - Code - SS-EN 1993-1:2005/AC:2009

HEA 300 Bar: 1 Beam_1 Section OK
 x = 0.50 L = 3.000 m
 Load case: 102 Brottråns 6.10b 11.09+2*1.37

Simplified results Displacements Detailed results

FORCES
 My,Ed = 312.50 kN*m
 My,e,Rd = 447.06 kN*m
 My,c,Rd = 447.06 kN*m
 Mb,Rd = 354.88 kN*m

LATERAL BUCKLING
 z = 1.00 M_{cr} = 574.14 kN*m
 L_{cr,upp} = 6.000 m Lam_LT = 0.88 Curve:LT - b XLT = 0.77
 i_{LT} = 0.87 XLT_{mod} = 0.79

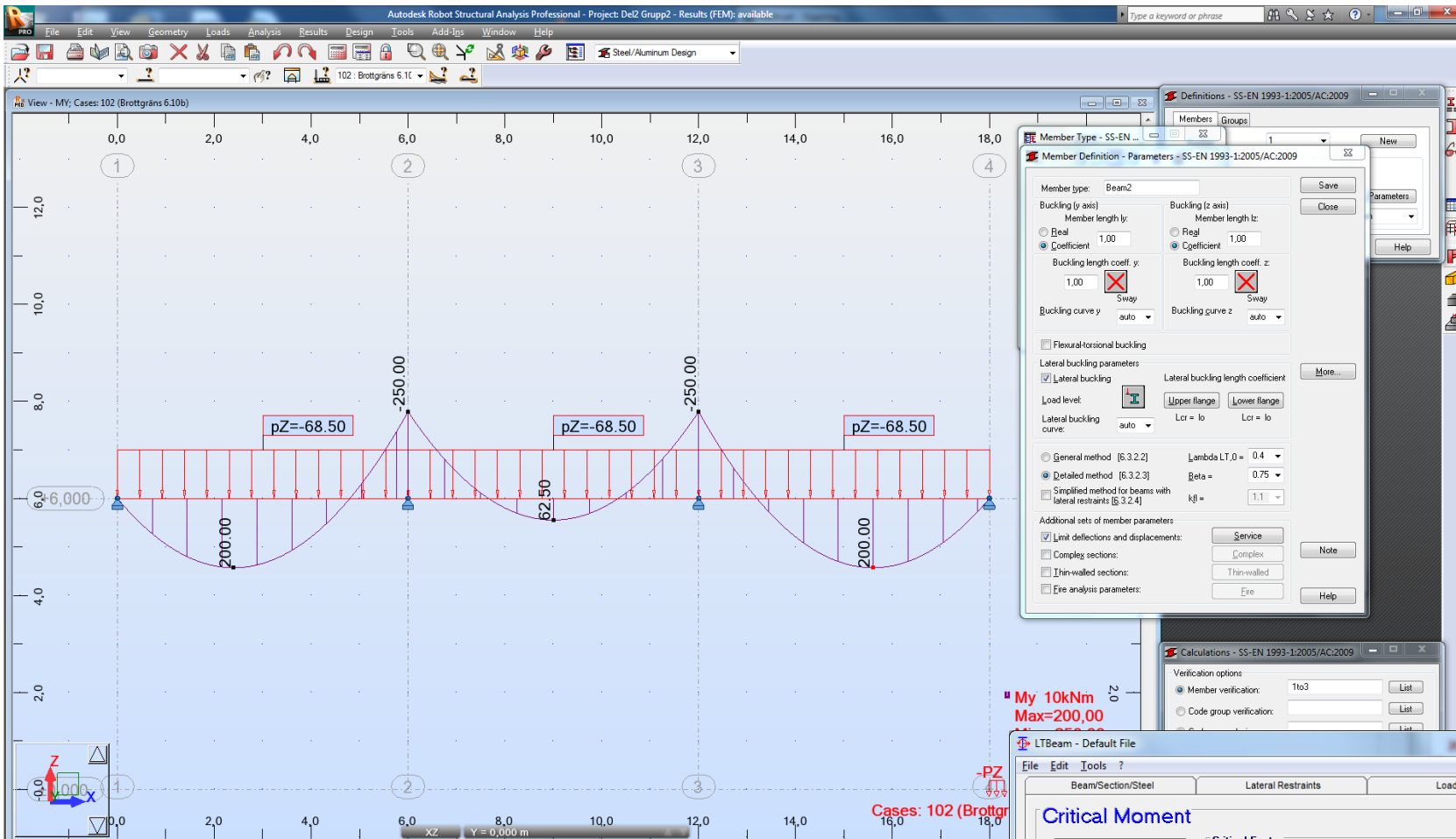
BUCKLING y
BUCKLING z

SECTION CHECK
 My,Ed/My,c,Rd = 0.70 < 1.00 (6.2.5.(1))

MEMBER STABILITY CHECK
 My,Ed/Mb,Rd = 0.88 < 1.00 (6.3.2.1.(1))

M_{cr} = 574 kNm

M_{cr} = 567 kNm



Member Definition - Parameters - SS-EN 1993-1:2005/AC:2009

Member type: Beam2

Buckling (y axis): Coefficient 1.00, Buckling length coeff. y: 1.00, Buckling curve y: auto

Buckling (z axis): Coefficient 1.00, Buckling length coeff. z: 1.00, Buckling curve z: auto

Lateral buckling parameters: Lateral buckling , Lateral buckling length coefficient: Lcr = lo

General method [6.3.2.2] $\lambda_{b,LT,0} = 0.4$

Detailed method [6.3.2.3] $\beta_{ta} = 0.75$

Simplified method for beams with lateral restraints [6.3.2.4] $k_{l} = 1.1$

Additional sets of member parameters: Limit deflections and displacements: Service, Note

Member Definition - Additional Parameters

Load parameters: Load type: M_y , M_z

Section parameters: Anet/Agross ratio: 1.00, Shear parameter ξ_{ta} : 1.00

Angles in tension [6.2.3.5]: Connected by one bolt row

Number of bolts n: 2

Diameter of bolt openings d0: 10 mm

Distances between bolts p1: 30 mm

Distance between bolt and angle edge e2: 20 mm

Pipes: Hot-rolled pipes

Yield strength: Basic f_{yb} , Average $f_{yA} = 235.00$ MPa

Additional conditions for round pipes: Pipes - unidirectional bending

Changed load type

Calculations - SS-EN 1993-1:2005/AC:2009

Verification options: Member verification: 1to3, Code group verification: List

LTBeam - Default File

Beam/Section/Steel | Lateral Restraints | Loading | Critical Moment

Critical Moment

Proceed

Critical Factor: N' Iteration 18, Current value 2.53738

Dichotomic process on determinant: Convergence achieved

Tolerance: 0,0001

$H_{cr} = 2.5374$

Critical Moment: $M_{max} = -250$ kN.m, $M_{max_{cr}} = -634,34$ kN.m

Deformed Shape: 3D View, Edit

Bending and Shear Diagrams: Refresh, M, V

$M_{max} = -250$ kN.m

$M_{cr} = 338$ kNm

$M_{cr} = 634$ kNm

RESULTS - Code - SS-EN 1993-1:2005/AC:2009

Bar: 1 Beam_1, Section OK

HEA 300, Load case: 102 Brotgräns 6.10b

Simplified results: Displacements, Detailed results

FORCES: $M_{y,Ed} = -250.00$ kN/m, $M_{y,Rd} = 447.06$ kN/m, $M_{z,Ed} = 250.00$ kN, $M_{z,Rd} = 763.47$ kN, $M_{b,Rd} = 281.74$ kN/m

LATERAL BUCKLING: $z = 1.00$, $M_{cr} = 338.27$ kN/m, $L_{cr,low} = 6.000$ m, $\lambda_{b,LT} = 1.15$, $f_{l,LT} = 1.12$, $X_{LT} = 0.61$, $X_{LT,mod} = 0.63$

BUCKLING y: BUCKLING z:

SECTION CHECK: $\sqrt{(\sigma_{p,Ed})^2 + 3(\tau_{a,z,Ed})^2} / (f_y / \gamma_{M0}) = 0.60 < 1.00$ (6.2.1 (5)), $V_{z,Ed} / V_{z,c,Rd} = 0.33 < 1.00$ (6.2.6 (1))

MEMBER STABILITY CHECK: $M_{y,Ed} / M_{b,Rd} = 0.89 < 1.00$ (6.3.2.1 (1))