

PRILOGA A: REZULTATI IZRAČUNA M_{cr} (program LTBeam)

- PRILOGA A1 – sekundarni nosilec

06-29-2016 15:21

CTICM

LTBeam

Version 1.0.11

Beam

Total length
Number of elements

L = 9 m
N = 100

Steel

Young modulus
Poisson's coefficient
Shear modulus

E = 210000 MPa
V = 0.3
G = 80769 MPa

Section - In Catalogue

Selected Profile
Weak flexural inertia
Torsional constant
Warping constant
Wagner factor

= IPE 400
I_z = 1317.8 cm⁴
I_t = 50.267 cm⁴
I_w = 492149 cm⁶
β_w = 0 mm

Lateral Restraints

Left End

Position of Restraint /S
Lateral restraint
Torsional restraint
Flexural restraint
Warping restraint

z = 0 mm
v = Fixed
θ = Fixed
v' = Free
θ' = Free

Right End

Position of Restraint /S
Lateral restraint
Torsional restraint
Flexural restraint
Warping restraint

z = 0 mm
v = Fixed
θ = Fixed
v' = Free
θ' = Free

Local 1

Abcissa/L
Position of Restraint /S
Lateral restraint
Torsional restraint

xf = 0.333
z = 0 mm
v = Fixed
θ = Free

Local 2

Abcissa/L
Position of Restraint /S
Lateral restraint

xf = 0.666
z = 0 mm
v = Fixed

Torsional restraint

θ = Free

Loading

Supports at Ends in the Plane of Bending

Hinged at both ends

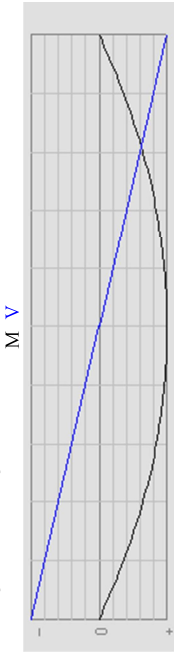
Distributed load

Value at the origin
Value at the end
Abcissa/L at the origin
Abcissa/L at the end
Position /S
q1 = -21.73 kN/m
q2 = -21.73 kN/m
xf1 = 0
xf2 = 1
z = 0 mm

Sketch of applied forces and lateral restraint positions



Bending and shear diagrams



Critical Moment

Eigenvalue solving

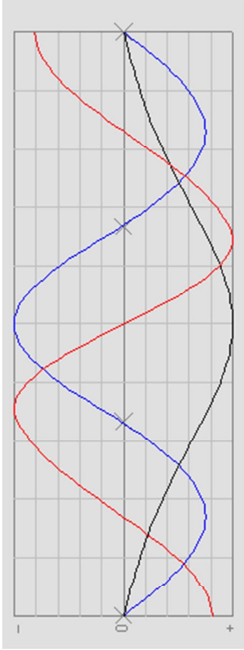
Dichotomic process on determinant
Convergence tolerance
Number of iterations performed
Convergence achieved
Eigenvalue obtained
= 0.0001
nit = 18
= 2.8925

Critical Moment

Critical value of maximum moment
Abcissa/L
Mer = 636.39 kN.m
xf = 0.500

Eigenmode

v θ v'



- PRILOGA A2 – primarni nosilec

CTICM

Version 1.0.11

07-25-2016 16:37

LTBeam

Beam

Total length
Number of elements

L = 10 m
N = 100

Steel

Young modulus
Poisson's coefficient
Shear modulus

E = 210000 MPa
V = 0.3
G = 80769 MPa

Section - In Catalogue

Selected Profile
Weak flexural inertia
Torsional constant
Warping constant
Wagner factor

= IPE 550
I_z = 2667.6 cm⁴
I_t = 122.16 cm⁴
I_w = 1.8932E+6 cm⁶
β_z = 0 mm

Lateral Restraints

Left End

Position of Restraint /S
Lateral restraint
Torsional restraint
Flexural restraint
Warping restraint

z = 0 mm
v = Fixed
Θ = Fixed
v' = Free
Θ' = Free

Right End

Position of Restraint /S
Lateral restraint
Torsional restraint
Flexural restraint
Warping restraint

z = 0 mm
v = Fixed
Θ = Fixed
v' = Free
Θ' = Free

Local 1

Abscissa/L
Position of Restraint /S
Lateral restraint
Torsional restraint

xf = 0.333
z = 0 mm
v = Fixed
Θ = Free

Local 2

Abscissa/L
Position of Restraint /S
Lateral restraint
Torsional restraint

xf = 0.666
z = 0 mm
v = Fixed
Θ = Free

Loading

Supports at Ends in the Plane of Bending
Hinged at both ends

Distributed load

Value at the origin
Value at the end
Abscissa/L at the origin
Abscissa/L at the end
Position /S

q1 = -1.4 kN/m
q2 = -1.4 kN/m
xf1 = 0
xf2 = 1
z = 0 mm

Point load

Value
Abscissa/L
Position /S

F = -184.7 kN
xf = 0.333
z = 0 mm

Point load

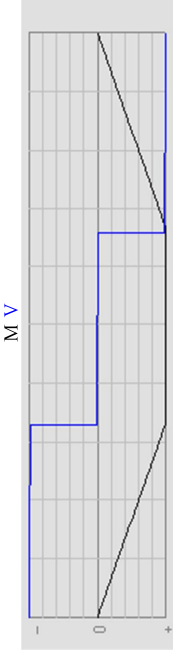
Value
Abscissa/L
Position /S

F = -184.7 kN
xf = 0.666
z = 0 mm

Sketch of applied forces and lateral restraint positions



Bending and shear diagrams



Maximum moment

Mmax = 633.49 kN m

Abcissa/L

xf = 0.510

Critical Moment

Eigenvalue solving

Dichotomic process on determinant
Convergence tolerance = 0.0001
Number of iterations performed mit = 18
Convergence achieved
Eigenvalue obtained = 2.0352

Critical Moment

Critical value of maximum moment Mer = 1289.3 kN.m
Abcissa/L xf = 0.510

Eigenmode

v θ v'

