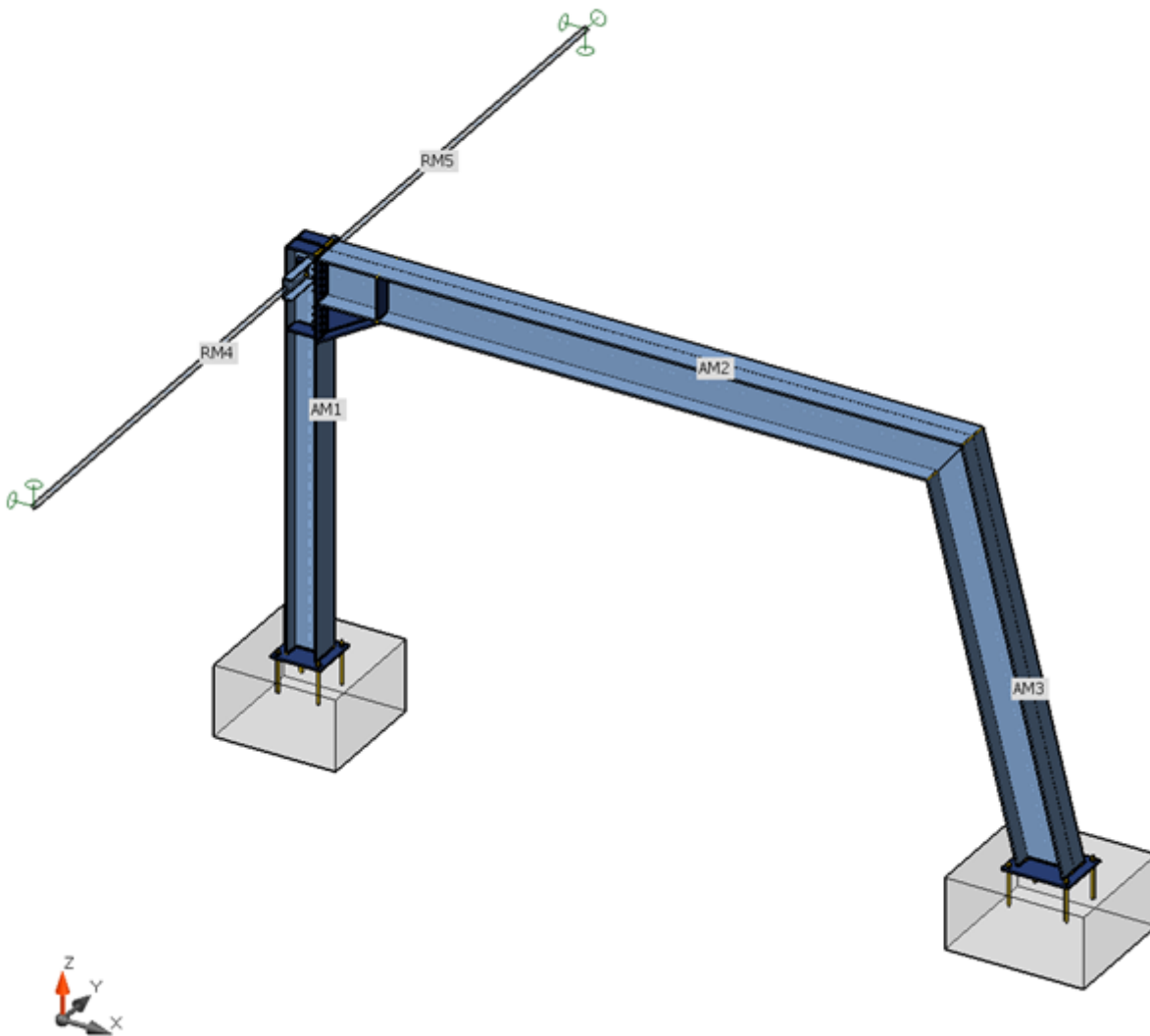


Project: Frame
Project no:
Author:

Project data

Project data	Frame
Date	8/20/2019
Design code	EN

Geometry



Project: Frame
Project no:
Author:

Analyzed members

AM1

Property	Value
Name	AM1
Members	M1
Cross-section	HEB260
Length	3.20 m
ey	0 mm
ez	0 mm
Begin	(0.00; 0.00; 0.00) m
End	(0.00; 0.00; 3.20) m

AM2

Property	Value
Name	AM2
Members	M2
Cross-section	HEA400
Length	5.40 m
ey	0 mm
ez	0 mm
Begin	(0.00; 0.00; 3.20) m
End	(5.40; 0.00; 3.20) m

AM3

Property	Value
Name	AM3
Members	M3
Cross-section	HEA400
Length	3.30 m
ey	0 mm
ez	0 mm
Begin	(5.40; 0.00; 3.20) m
End	(6.20; 0.00; 0.00) m

Project: Frame
 Project no:
 Author:

Related members

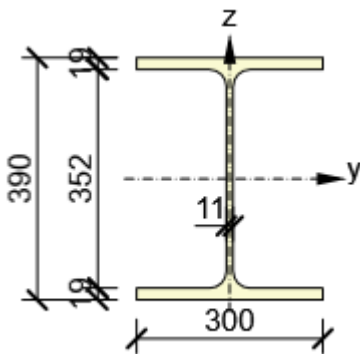
RM4

Property	Value
Name	RM4
Members	M4
Cross-section	U180
Length	4.00 m
ey	0 mm
ez	0 mm
Begin	(0.00; -4.00; 3.20) m
End	(0.00; 0.00; 3.20) m
Support	<input type="checkbox"/> X <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> Z <input type="checkbox"/> Rx <input type="checkbox"/> Ry <input type="checkbox"/> Rz

RM5

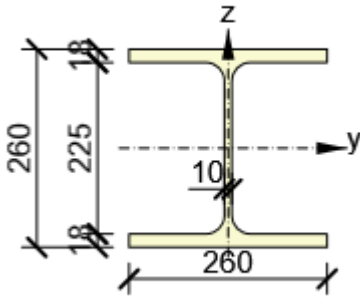
Property	Value
Name	RM5
Members	M5
Cross-section	U180
Length	4.00 m
ey	0 mm
ez	0 mm
Begin	(0.00; 4.00; 3.20) m
End	(0.00; 0.00; 3.20) m
Support	<input checked="" type="checkbox"/> X <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> Z <input type="checkbox"/> Rx <input type="checkbox"/> Ry <input type="checkbox"/> Rz

Cross-section

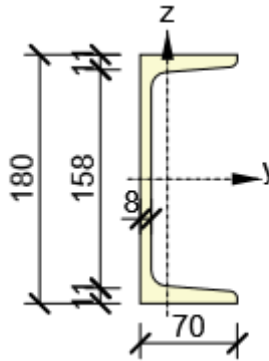


HEA400, Material: S 355

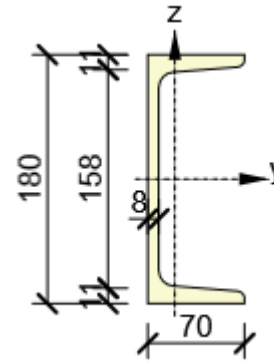
Project: Frame
 Project no:
 Author:



HEB260, Material: S 355



U180, Material: S 355



U180, Material: S 355

Loading

LC1

Line load

Member	Begin [m]	End [m]	X [kN/m]	Y [kN/m]	Z [kN/m]	Location	Width [mm]	Ey [mm]
AM2	0.00	5.40	0.0	0.0	-160.0	Top	300	0

Point load

Member	N [kN]	Vy [kN]	Vz [kN]	Mx [kN]	My [kN]	Mz [kN]
RM4 / Begin	0.0	0.0	0.0	0.0	0.0	0.0
RM5 / Begin	0.0	0.0	0.0	0.0	0.0	0.0

Results

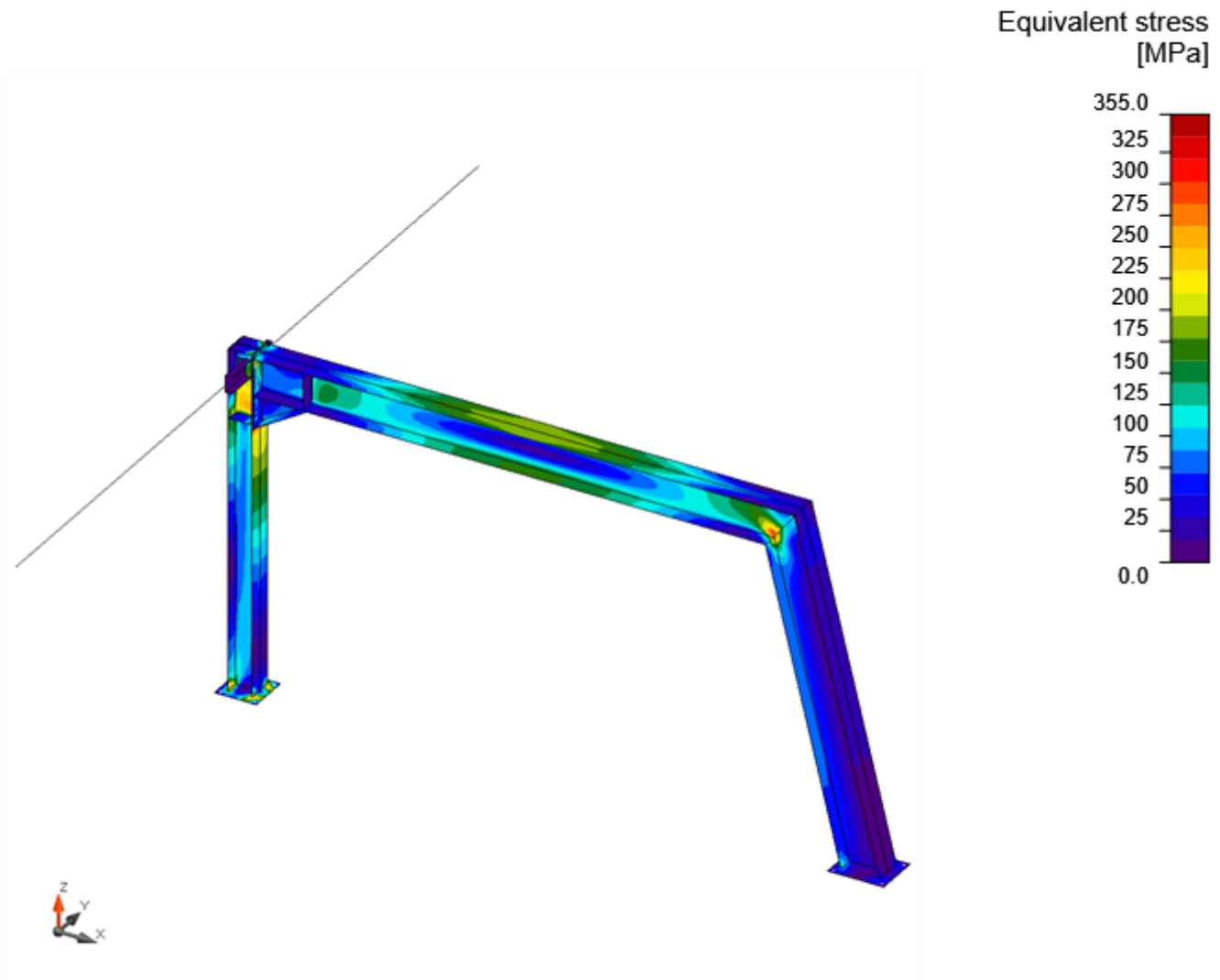
Materially non-linear analysis (MNA)

Summary

Load	Applied loads [%]
LE1	100.0

Project:
Project no:
Author:

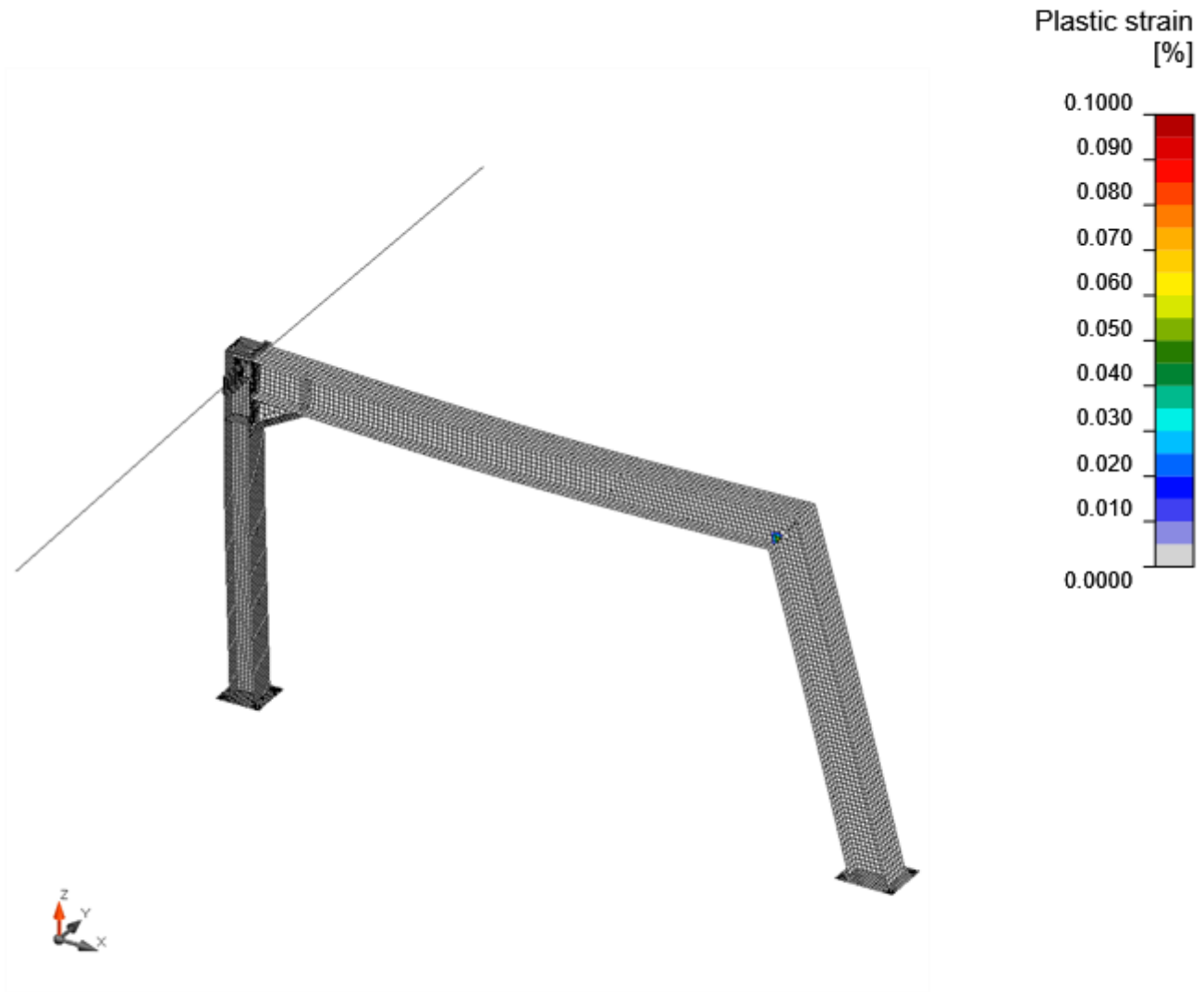
Frame



Eq. stress ,LC1

Project:
Project no:
Author:

Frame



Plastic strain ,LC1

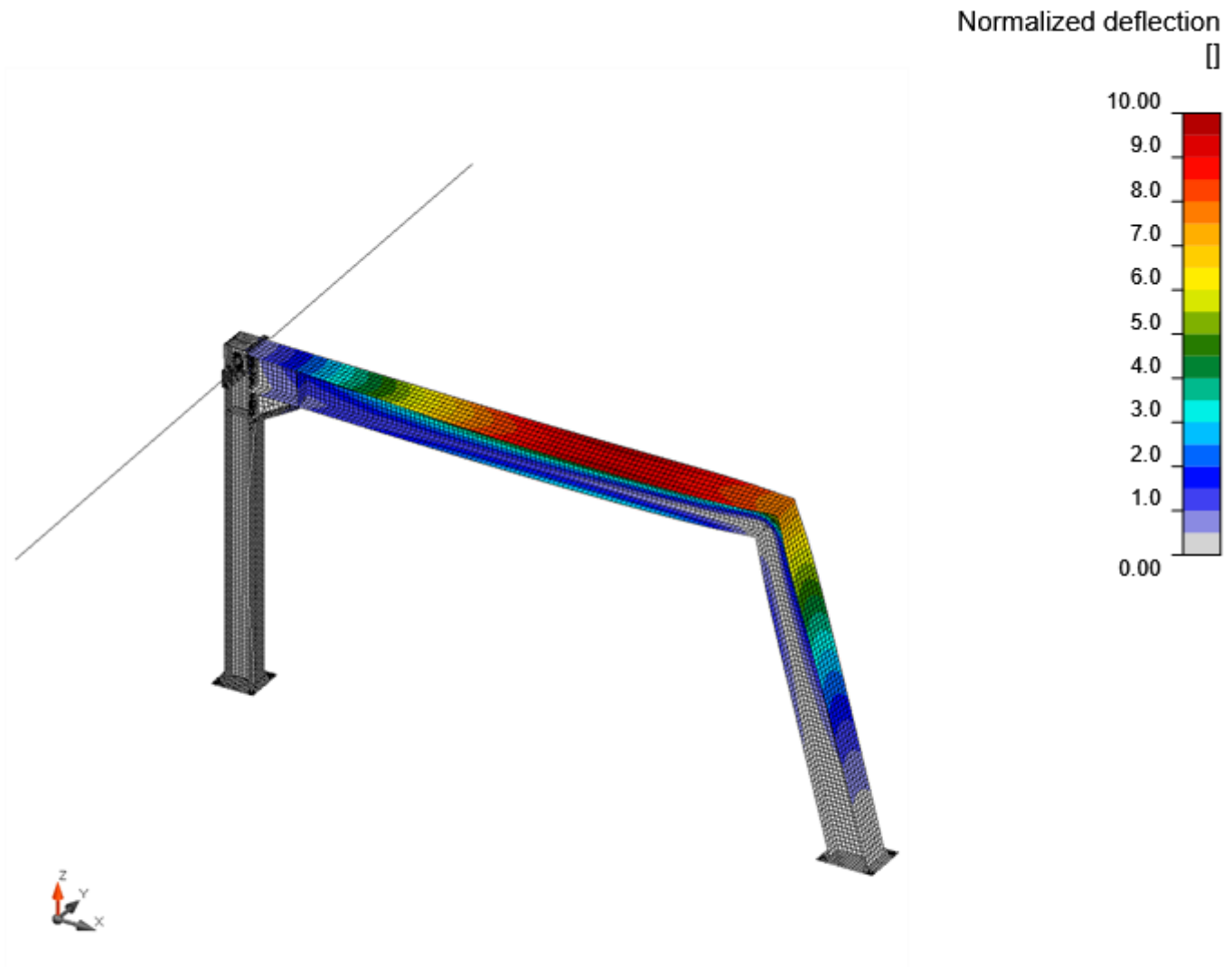
Project: Frame
 Project no:
 Author:

Plates

Part	Name	Material	Th [mm]	Load	σ_{Ed} [MPa]	ϵ_{pl} [%]	Check
AM1	Bottom flange 1	S 355	18	LE1	355.1	0.0	OK
	Top flange 1	S 355	18	LE1	275.5	0.0	OK
	Web 1	S 355	10	LE1	277.4	0.0	OK
AM2	Bottom flange 1	S 355	19	LE1	169.2	0.0	OK
	Top flange 1	S 355	19	LE1	202.3	0.0	OK
	Web 1	S 355	11	LE1	355.2	0.1	OK
AM3	Bottom flange 1	S 355	19	LE1	278.9	0.0	OK
	Top flange 1	S 355	19	LE1	52.2	0.0	OK
	Web 1	S 355	11	LE1	318.5	0.0	OK
RM4	Bottom flange 1	S 355	11	LE1	5.4	0.0	OK
	Top flange 1	S 355	11	LE1	5.5	0.0	OK
	Web 1	S 355	8	LE1	14.8	0.0	OK
RM5	Bottom flange 1	S 355	11	LE1	5.5	0.0	OK
	Top flange 1	S 355	11	LE1	5.3	0.0	OK
	Web 1	S 355	8	LE1	14.8	0.0	OK
CON1	Base plate (BP1)	S 355	20	LE1	283.2	0.0	OK
CON2	End plate (EP1)	S 355	16	LE1	338.0	0.0	OK
	Widener (WID1a)	S 355	11	LE1	103.9	0.0	OK
	Flange (WID1b)	S 355	19	LE1	126.4	0.0	OK
	Stiffener (STIFF1a)	S 355	19	LE1	205.8	0.0	OK
	Stiffener (STIFF1b)	S 355	19	LE1	206.3	0.0	OK
	Stiffener (STIFF2a)	S 355	19	LE1	175.4	0.0	OK
	Stiffener (STIFF2b)	S 355	19	LE1	177.2	0.0	OK
	Stiffener (STIFF3a)	S 355	19	LE1	37.5	0.0	OK
	Stiffener (STIFF3b)	S 355	19	LE1	37.7	0.0	OK
CON4	Base plate (BP1)	S 355	20	LE1	112.1	0.0	OK

Design data

Material	f_y [MPa]	ϵ_{lim} [%]
S 355	355.0	5.0



Normalized deflection, LE1, Buckling shape 1

Linear buckling analysis (LBA)

Buckling

Loads	1 [-]	2 [-]	3 [-]	4 [-]	5 [-]	6 [-]
LE1	2.43	4.27	6.87	7.93	10.51	10.60

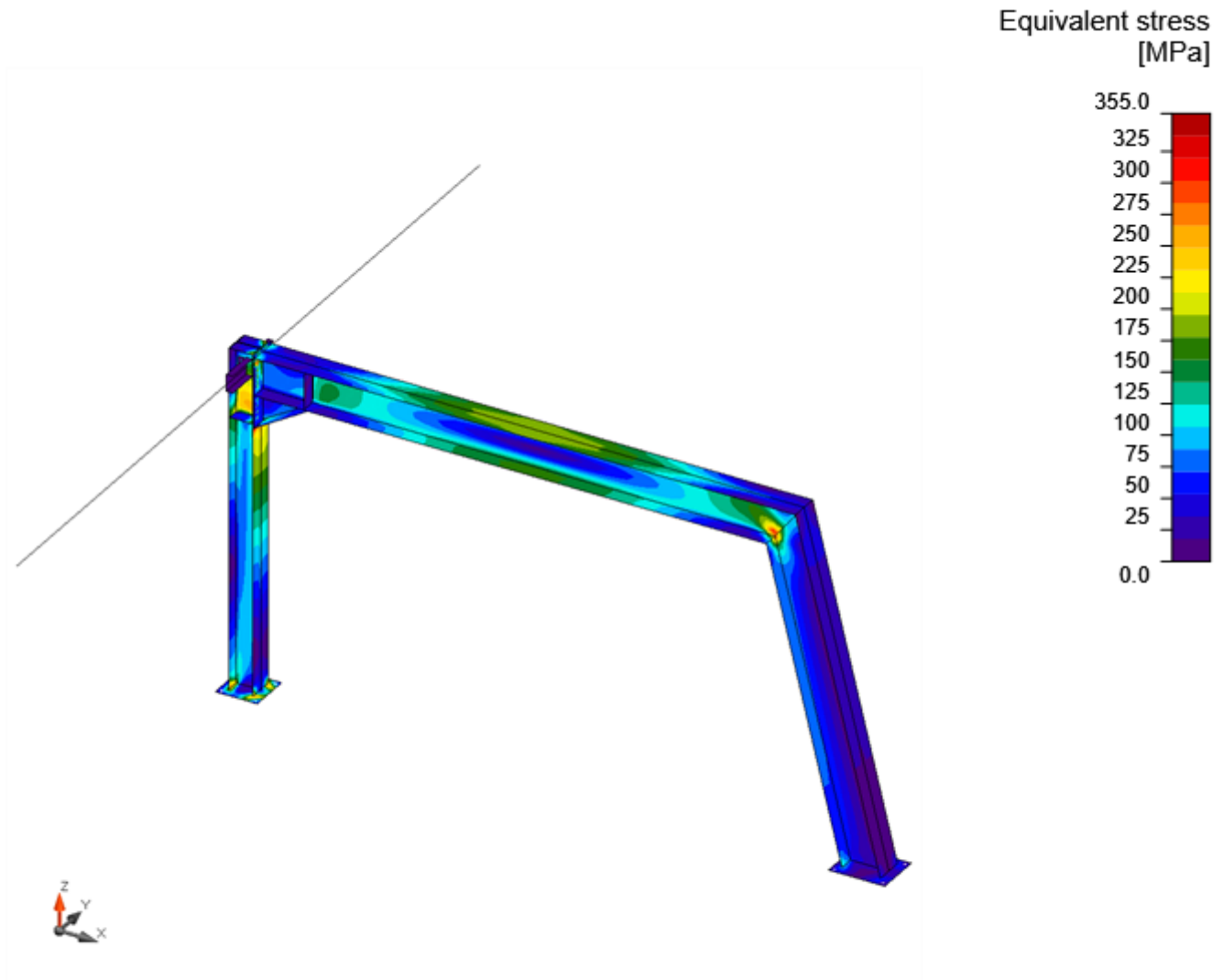
Geometrically and materially non-linear analysis with imperfections (GMNIA)

Summary

Load	Applied loads [%]
LE1	100.0

Imperfections

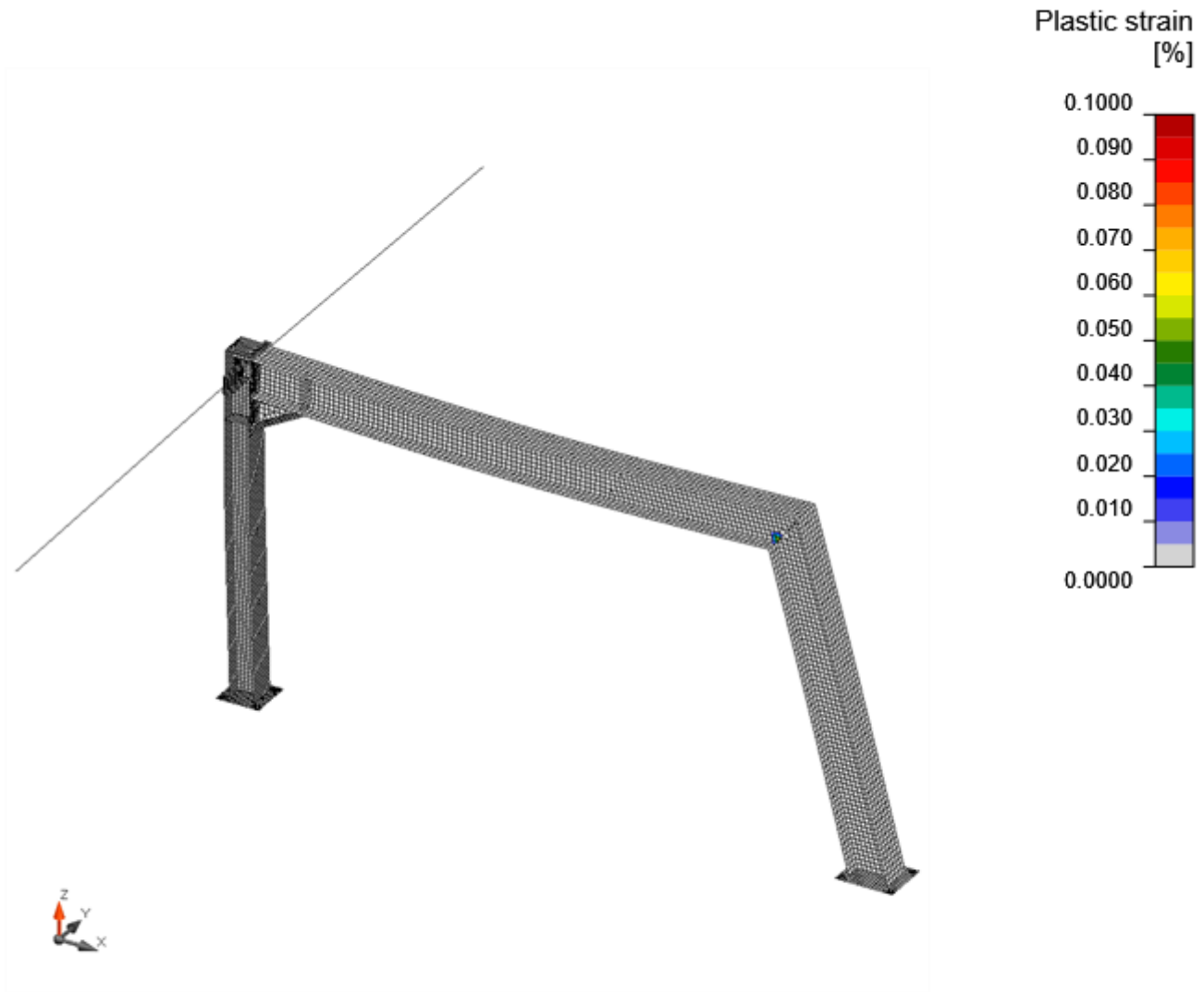
Loads		1	2	3	4	5	6
LE1	Buckling factor [-]	2.43	4.27	6.87	7.93	10.51	10.60
	Amplitude [mm]	9	0	0	0	0	0



Eq. stress ,LC1

Project:
Project no:
Author:

Frame



Plastic strain ,LC1

Project: Frame
 Project no:
 Author:

Plates

Part	Name	Material	Th [mm]	Load	σ_{Ed} [MPa]	ϵ_{pl} [%]	Check
AM1	Bottom flange 1	S 355	18	LE1	355.2	0.1	OK
	Top flange 1	S 355	18	LE1	242.5	0.0	OK
	Web 1	S 355	10	LE1	299.5	0.0	OK
AM2	Bottom flange 1	S 355	19	LE1	172.8	0.0	OK
	Top flange 1	S 355	19	LE1	213.9	0.0	OK
	Web 1	S 355	11	LE1	355.3	0.1	OK
AM3	Bottom flange 1	S 355	19	LE1	255.7	0.0	OK
	Top flange 1	S 355	19	LE1	92.1	0.0	OK
	Web 1	S 355	11	LE1	355.1	0.0	OK
RM4	Bottom flange 1	S 355	11	LE1	9.7	0.0	OK
	Top flange 1	S 355	11	LE1	10.1	0.0	OK
	Web 1	S 355	8	LE1	28.0	0.0	OK
RM5	Bottom flange 1	S 355	11	LE1	6.8	0.0	OK
	Top flange 1	S 355	11	LE1	6.5	0.0	OK
	Web 1	S 355	8	LE1	19.3	0.0	OK
CON1	Base plate (BP1)	S 355	20	LE1	263.3	0.0	OK
CON2	End plate (EP1)	S 355	16	LE1	353.4	0.0	OK
	Widener (WID1a)	S 355	11	LE1	120.5	0.0	OK
	Flange (WID1b)	S 355	19	LE1	133.3	0.0	OK
	Stiffener (STIFF1a)	S 355	19	LE1	220.9	0.0	OK
	Stiffener (STIFF1b)	S 355	19	LE1	229.9	0.0	OK
	Stiffener (STIFF2a)	S 355	19	LE1	191.1	0.0	OK
	Stiffener (STIFF2b)	S 355	19	LE1	191.5	0.0	OK
	Stiffener (STIFF3a)	S 355	19	LE1	35.2	0.0	OK
	Stiffener (STIFF3b)	S 355	19	LE1	50.5	0.0	OK
CON4	Base plate (BP1)	S 355	20	LE1	187.5	0.0	OK

Design data

Material	f_y [MPa]	ϵ_{lim} [%]
S 355	355.0	5.0

Symbol explanation

Symbol	Explanation
σ_{Ed}	Eq. stress
ϵ_{pl}	Strain
f_y	Yield strength
ϵ_{lim}	Limit of plastic strain used in 2D plate element check

Code settings

Project: Frame
Project no:
Author:



Stop at limit strain	No	
Pretension force factor k	0.70	-
Friction coefficient in slip-resistance	0.30	-
γ M2	1.25	-
Anchor length for stiffness calculation [d]	8	
Limit plastic strain	500.0	1e-4
Division of surface of the biggest circular hollow member	64	
Division of arc of rectangular hollow member	3	
Number of elements on biggest member web or flange	8	
Number of elements on biggest web of RHS member	16	
Number of analysis iterations	40	
Divergent iterations count	15	
Minimal size of element	10	mm
Maximal size of element	50	mm

Software info

Application: IDEA StatiCa Member
Version: 21.0.2.178
Developed by: IDEA StatiCa