APPENDIXES

CONTENT

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APPENDIX A

Load combinations, deformations, internal forces and reactions on A axis

A1. Loads

This part contains the imposed loads on the A axis

A2. Load combinations

This part contains the load combination inputs to Scia Engineer software

A3. Deformations

This part contains the deformation output from Scia Engineer software

A4. Reactions

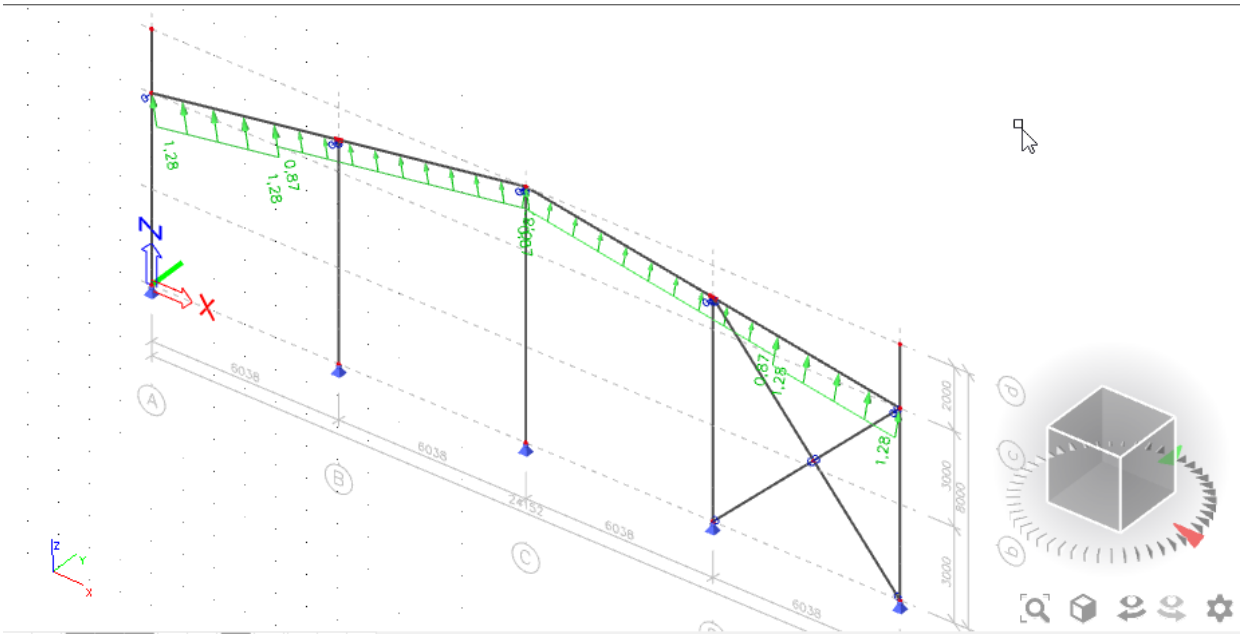
This part contains the reactions to the supports from Scia Engineer software

A5. Internal forces

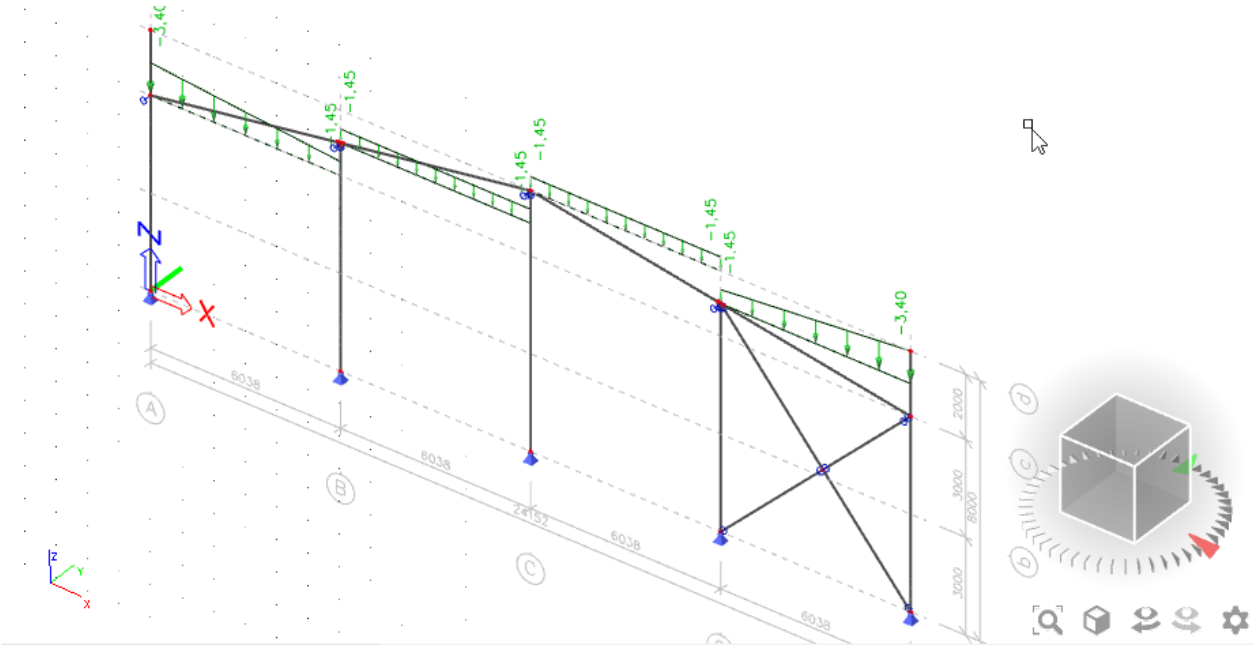
This part contains the internal forces output from Scia Engineer software

Loads

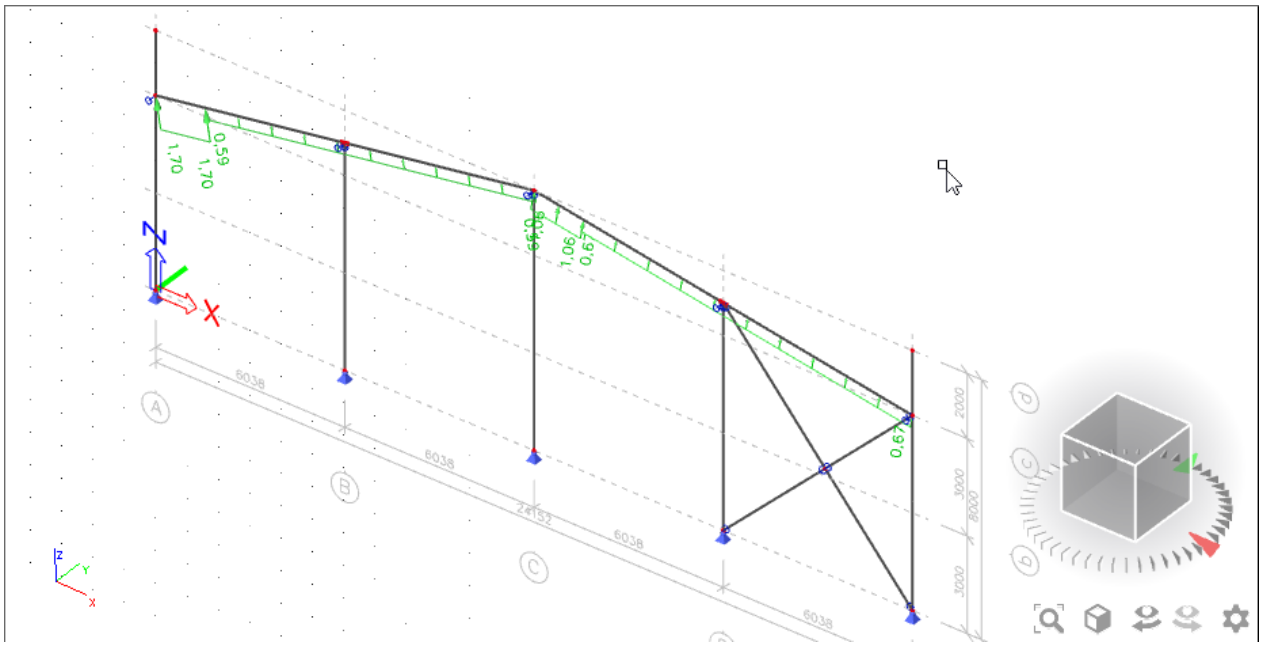
A Axis – Roof Load



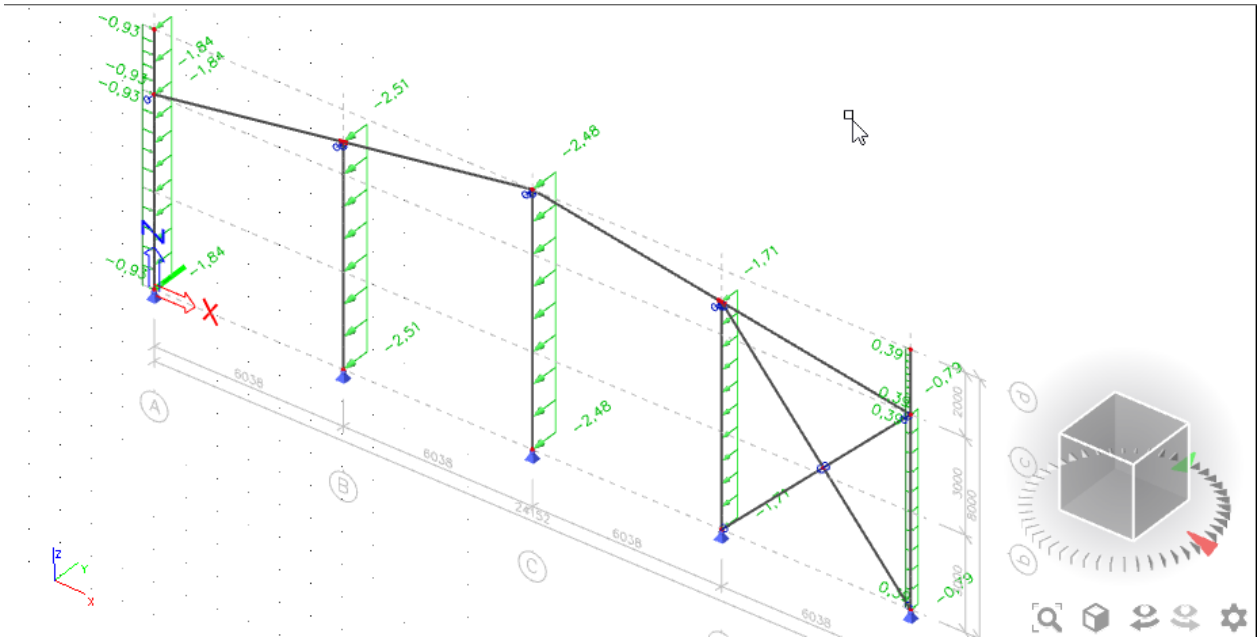
A Axis – Snow Load



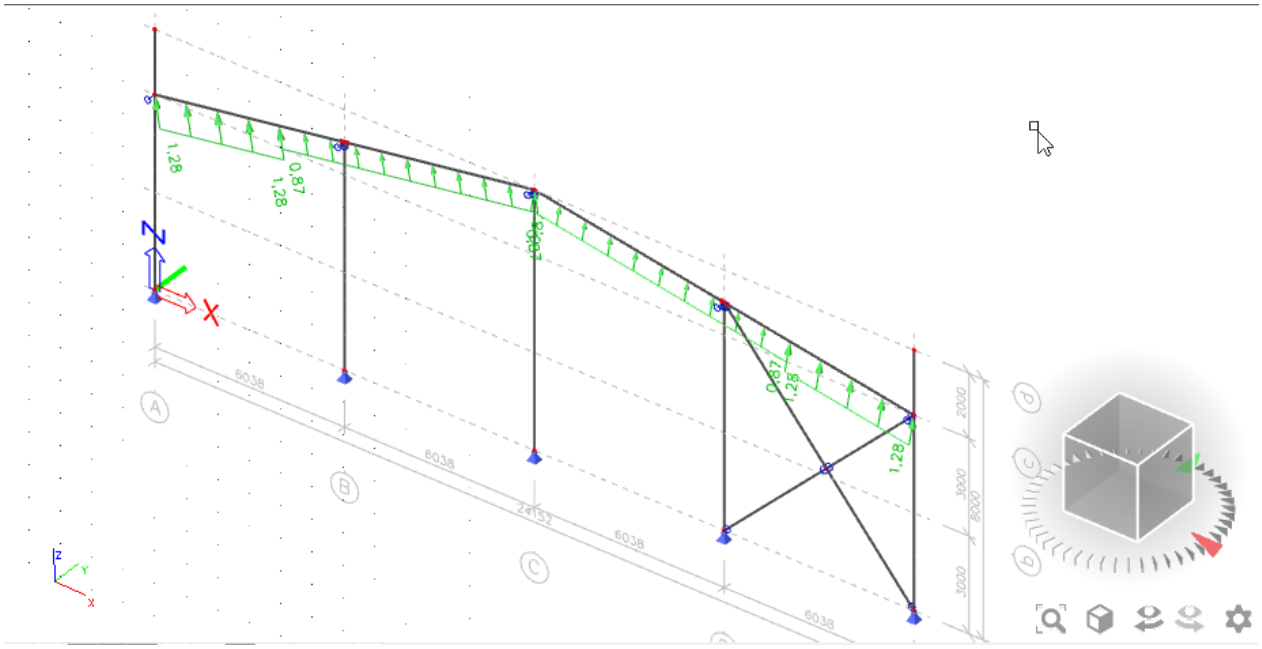
A Axis – Wind Load 1 - Roof



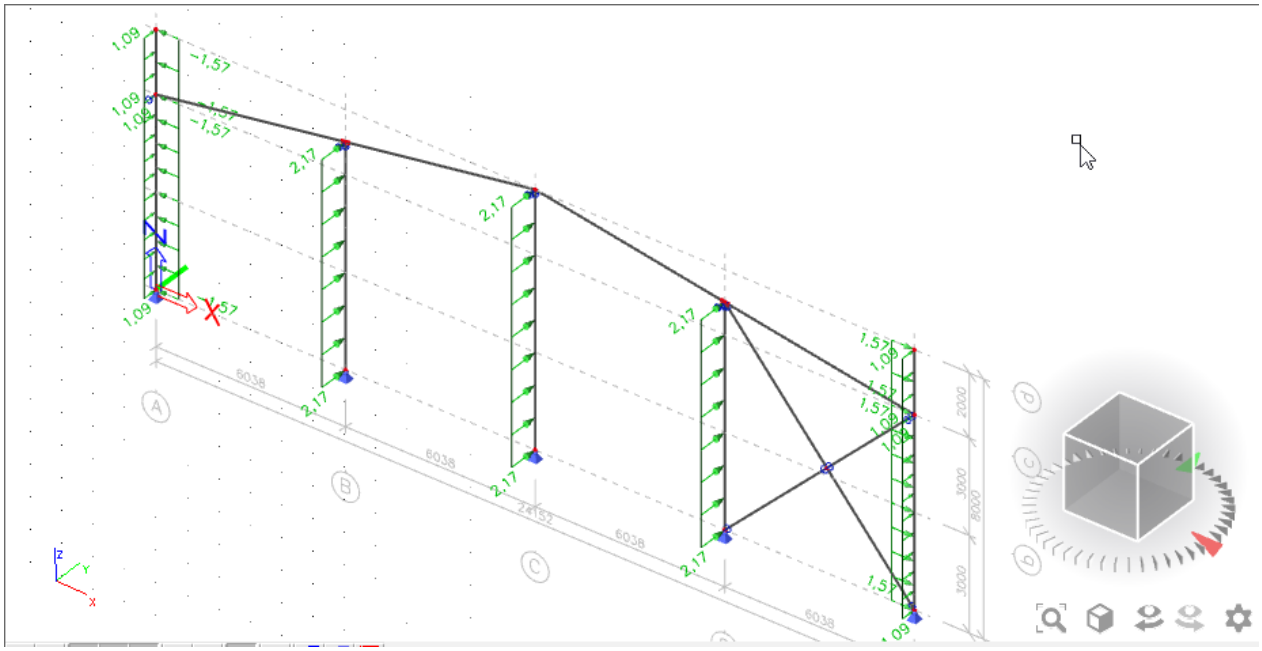
A Axis – Wind 1 Load – Walls



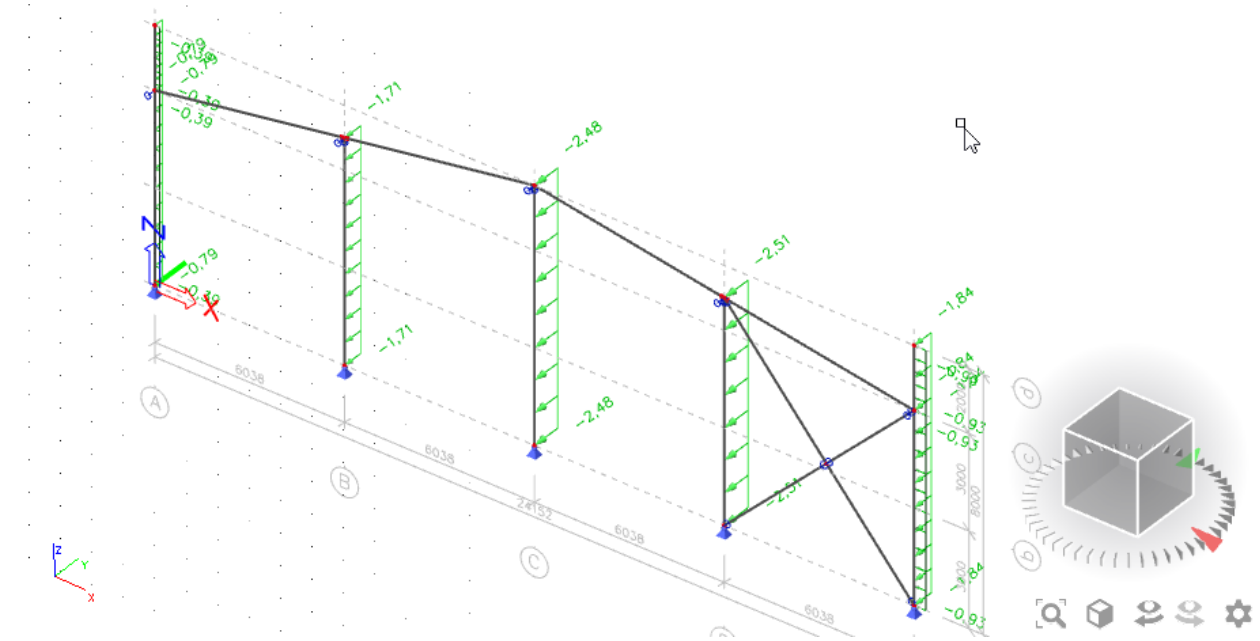
A Axis – Wind Load 2 - Roof



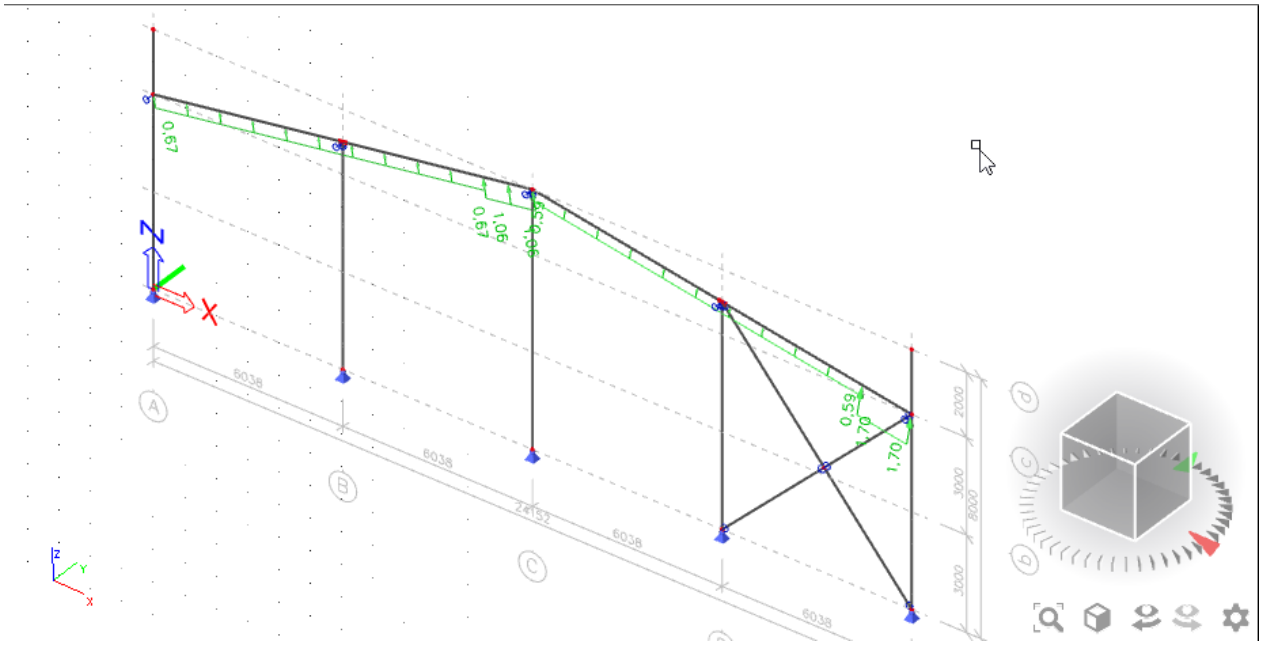
A Axis – Wind Load 2 - Walls



A Axis – Wind Load 3 – Roof



A Axis – Wind Load 3 – Walls



A Axis SLS Cases

Name	SLS_Case_1.1
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
SL - snow load [-]	1,00
RL - roof load [-]	1,00

Name	SLS_Case_1.2
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
SL - snow load [-]	0,50
RL - roof load [-]	1,00

Name	SLS_Case_2.1
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
SL - snow load [-]	1,00
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	0,60
WLR1 - wind load roof 1 [-]	0,60

Name	SLS_Case_2.2
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
SL - snow load [-]	1,00
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	0,60
WLR2 - wind load roof 2 [-]	0,60

Name	SLS_Case_2.3
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
SL - snow load [-]	1,00
RL - roof load [-]	1,00
WLW3 - wind load walls 3 [-]	0,60
WLR3 - wind load roof 3 [-]	0,60

Name	SLS_Case_2.4
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
SL - snow load [-]	0,50
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	1,00
WLR1 - wind load roof 1 [-]	1,00

Name	SLS_Case_2.5
Description	
Type	EN-SLS Characteristic
Structure	Building

Name	SLS_Case_2.6
Description	
Type	EN-SLS Characteristic
Structure	Building

Name	SLS_Case_2.7
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	1,00
WLR1 - wind load roof 1 [-]	1,00

Name	SLS_Case_2.8
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	1,00
WLR2 - wind load roof 2 [-]	1,00

Name	SLS_Case_2.9
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
RL - roof load [-]	1,00
WLW3 - wind load walls 3 [-]	1,00
WLR3 - wind load roof 3 [-]	1,00

A Axis ULS Cases

Name	NC_ULS_Case_1.1
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	1,50
RL - roof load [-]	1,35
Bow imperfection	None
Global imperfection	None

Name	NC_ULS_Case_1.2
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	0,75
RL - roof load [-]	1,35
Bow imperfection	None
Global imperfection	None

Name	NC_ULS_Case_2.1
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	1,50
RL - roof load [-]	1,35
WLW1 - wind load walls 1 [-]	0,90
WLR1 - wind load roof 1 [-]	0,90
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9
dy [mm/m]	-2,9

Name	NC_ULS_Case_2.2
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	1,50
RL - roof load [-]	1,35
WLW2 - wind load walls 2 [-]	0,90
WLR2 - wind load roof 2 [-]	0,90
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9
dy [mm/m]	2,9

Name	NC_ULS_Case_2.3
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	1,50
RL - roof load [-]	1,35
WLW3 - wind load walls 3 [-]	0,90
WLR3 - wind load roof 3 [-]	0,90
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	-2,9
dy [mm/m]	-2,9

Name	NC_ULS_Case_2.4
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	0,75
RL - roof load [-]	1,35
WLW1 - wind load walls 1 [-]	1,50
WLR1 - wind load roof 1 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9
dy [mm/m]	-2,9

Name	NC_ULS_Case_2.5
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	0,75
RL - roof load [-]	1,35
WLW2 - wind load walls 2 [-]	1,50
WLR2 - wind load roof 2 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9
dy [mm/m]	2,9

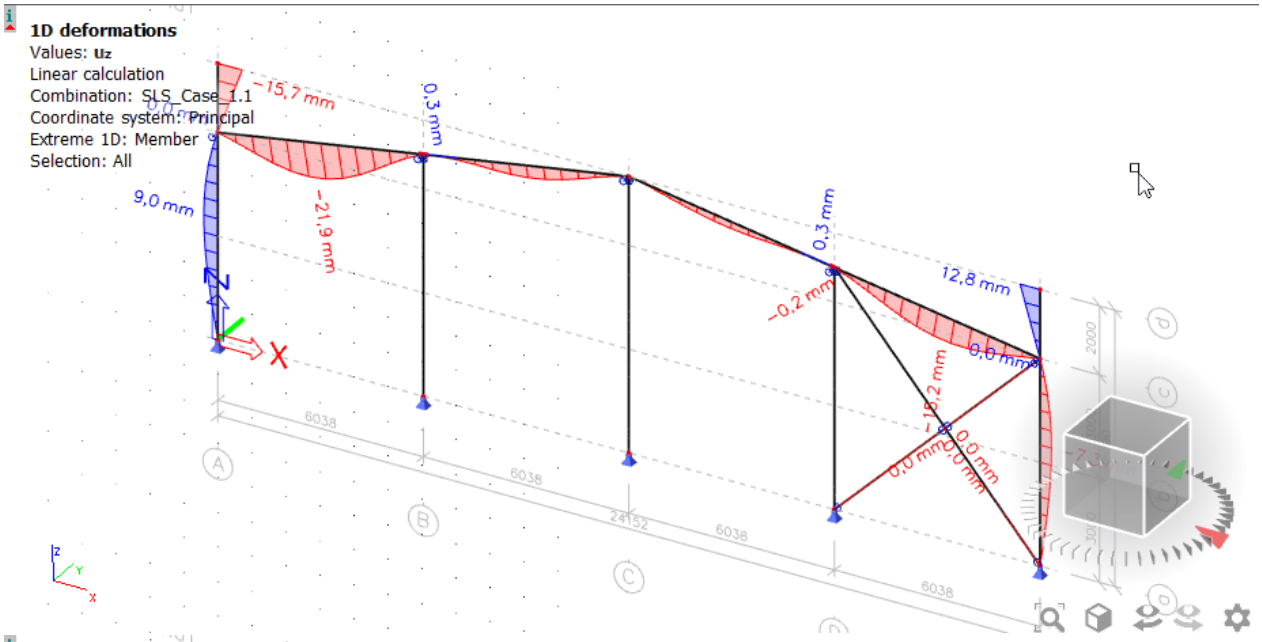
Name	NC_ULS_Case_2.6
Description	
Type	Ultimate
Contents of combination	
SL - snow load [-]	0,75
RL - roof load [-]	1,35
WLW3 - wind load walls 3 [-]	1,50
WLR3 - wind load roof 3 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	-2,9
dy [mm/m]	-2,9

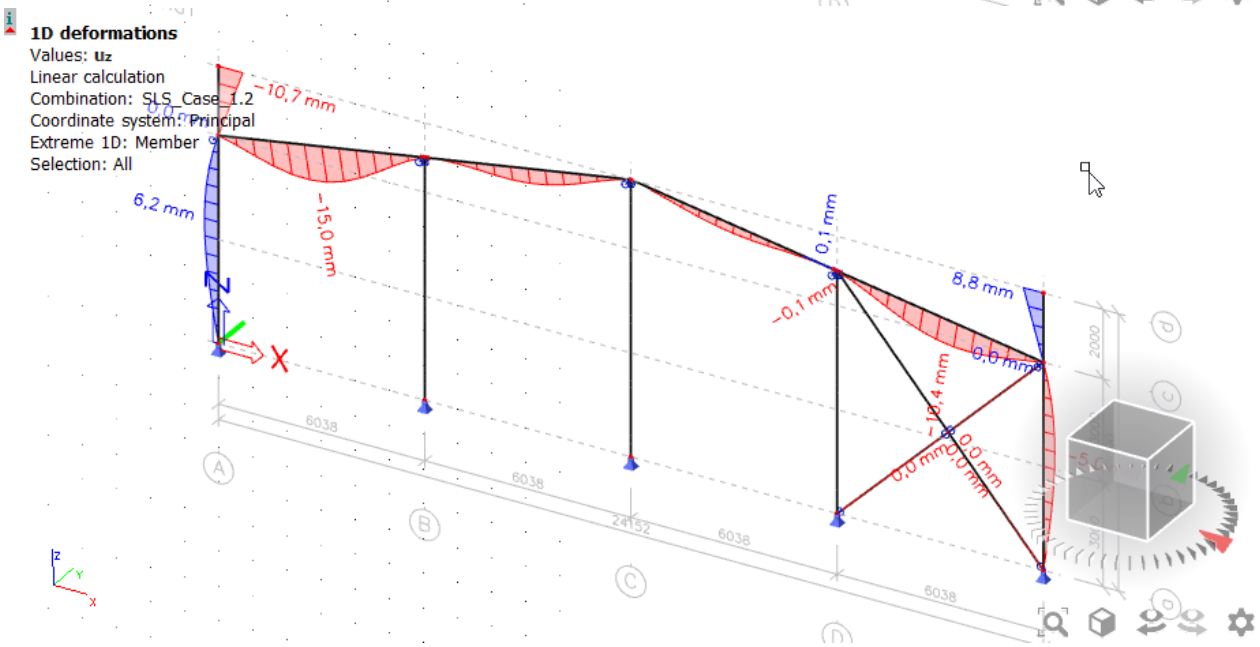
Name	NC_ULS_Case_2.7
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	1,50
WLR1 - wind load roof 1 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9
dy [mm/m]	-2,9

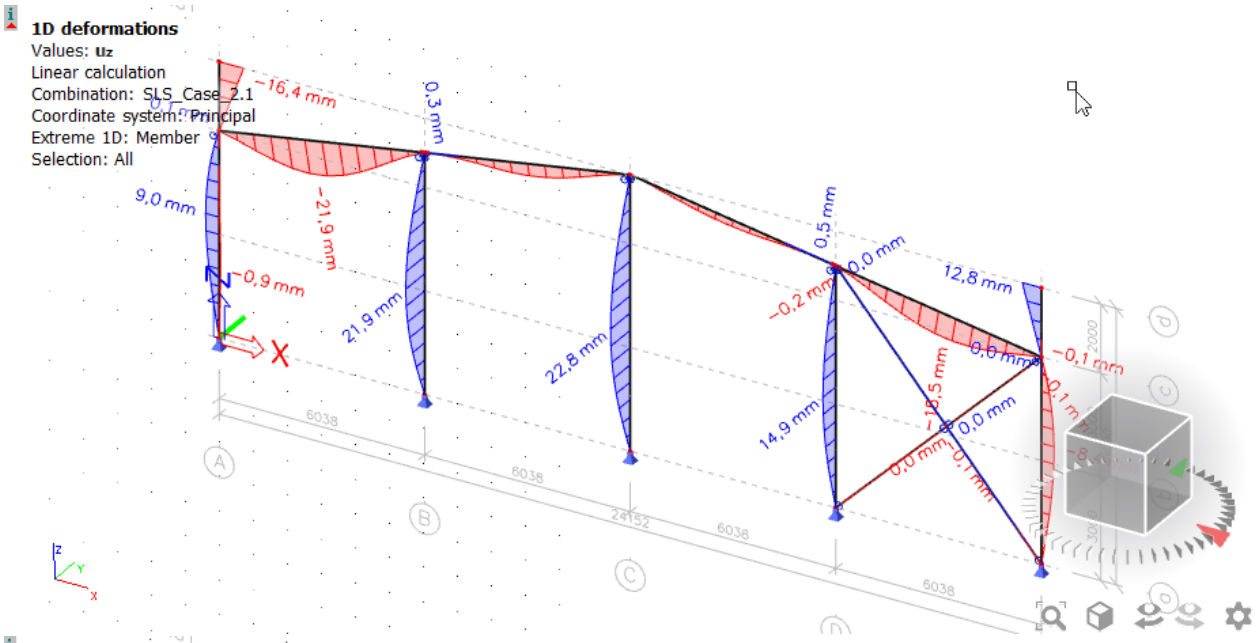
Name	NC_ULS_Case_2.8
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	1,50
WLR2 - wind load roof 2 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9
dy [mm/m]	2,9

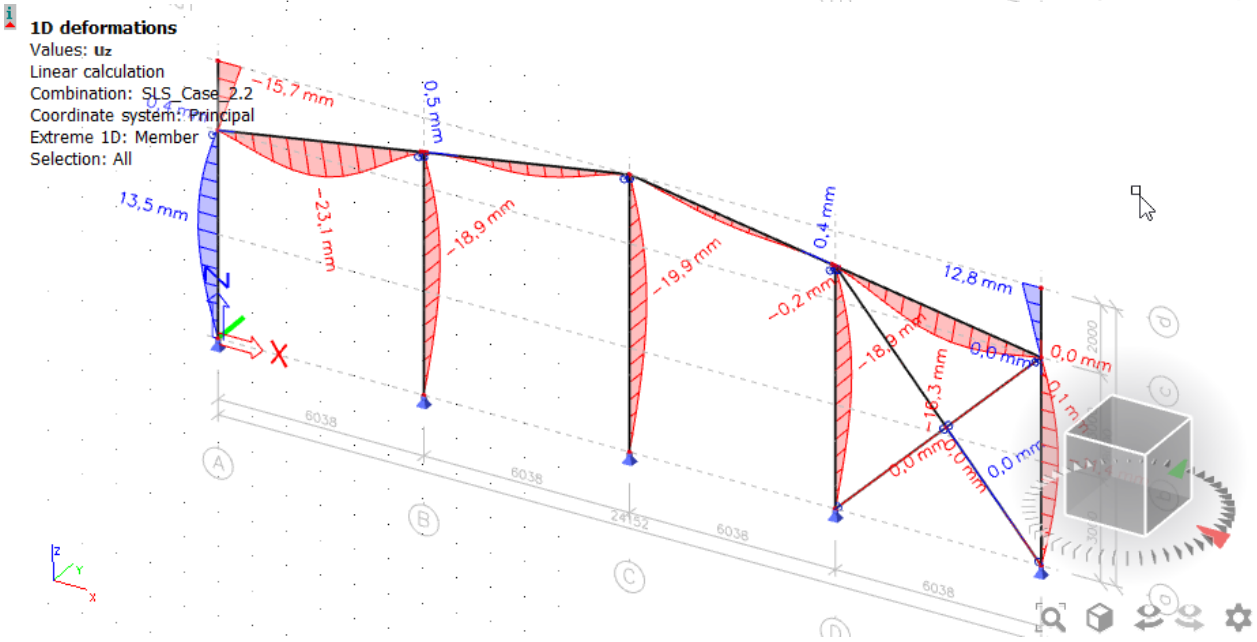
Name	NC_ULS_Case_2.9
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,00
WLW3 - wind load walls 3 [-]	1,50
WLR3 - wind load roof 3 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	-2,9
dy [mm/m]	-2,9

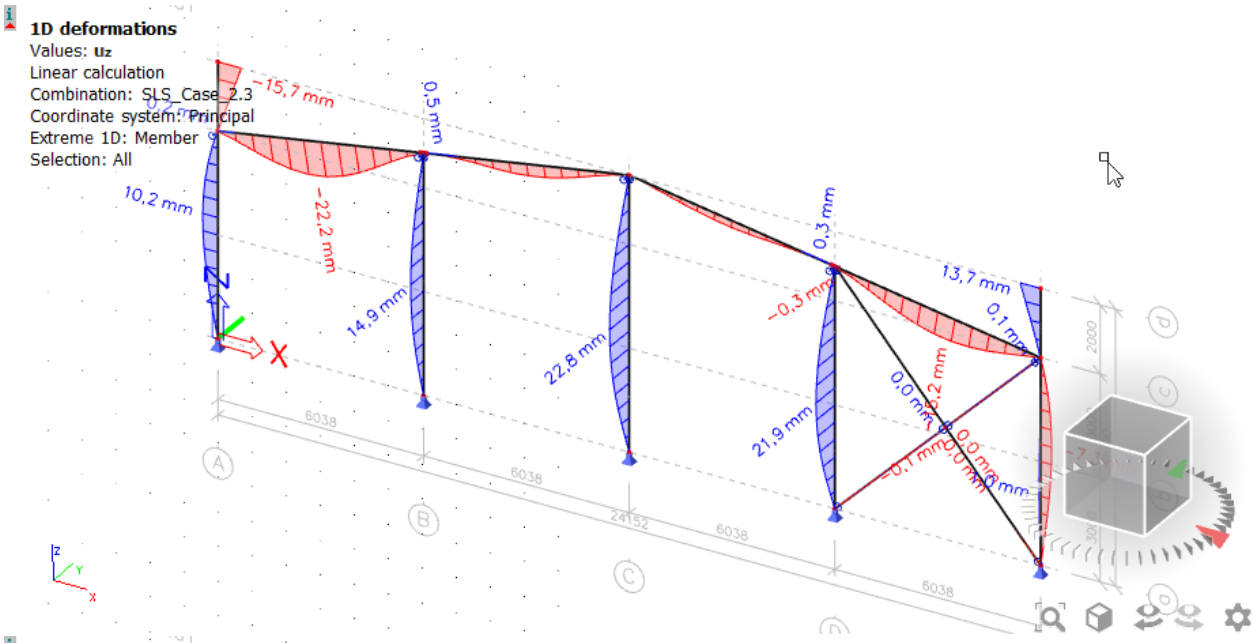
A axis - Deformations

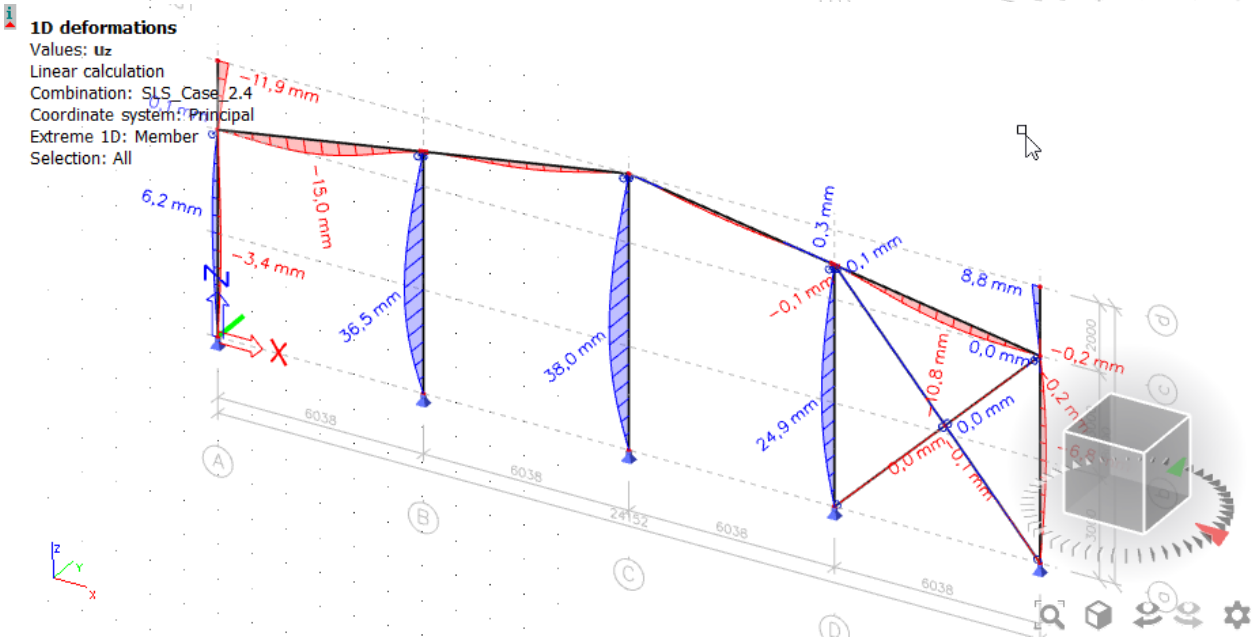


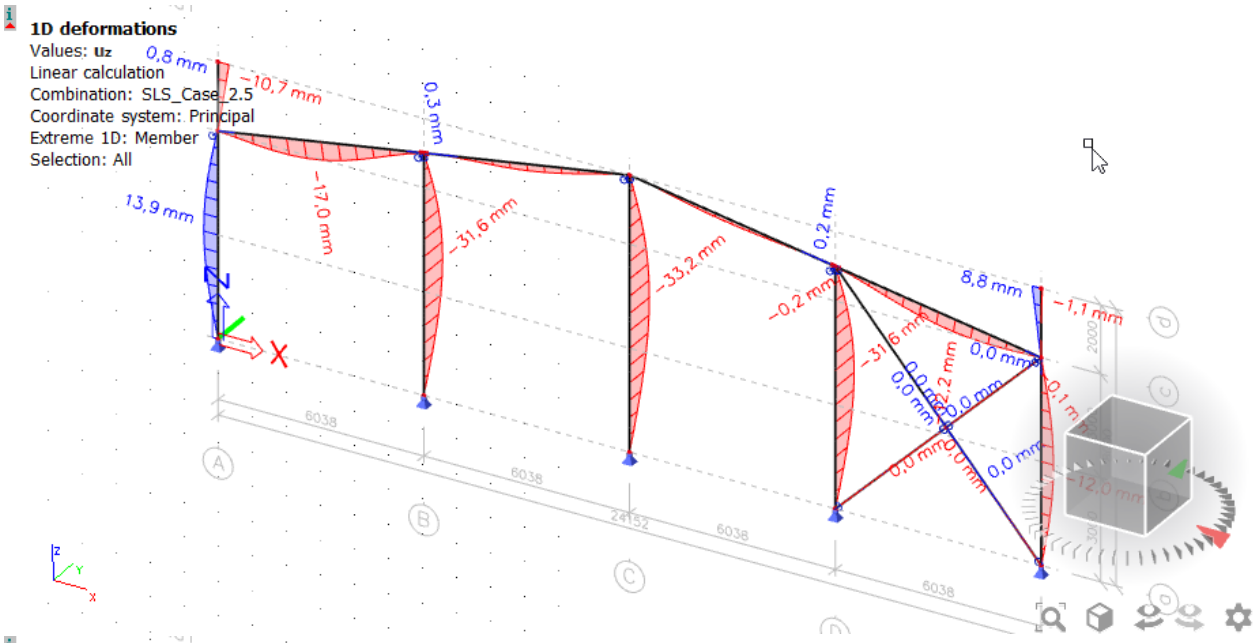


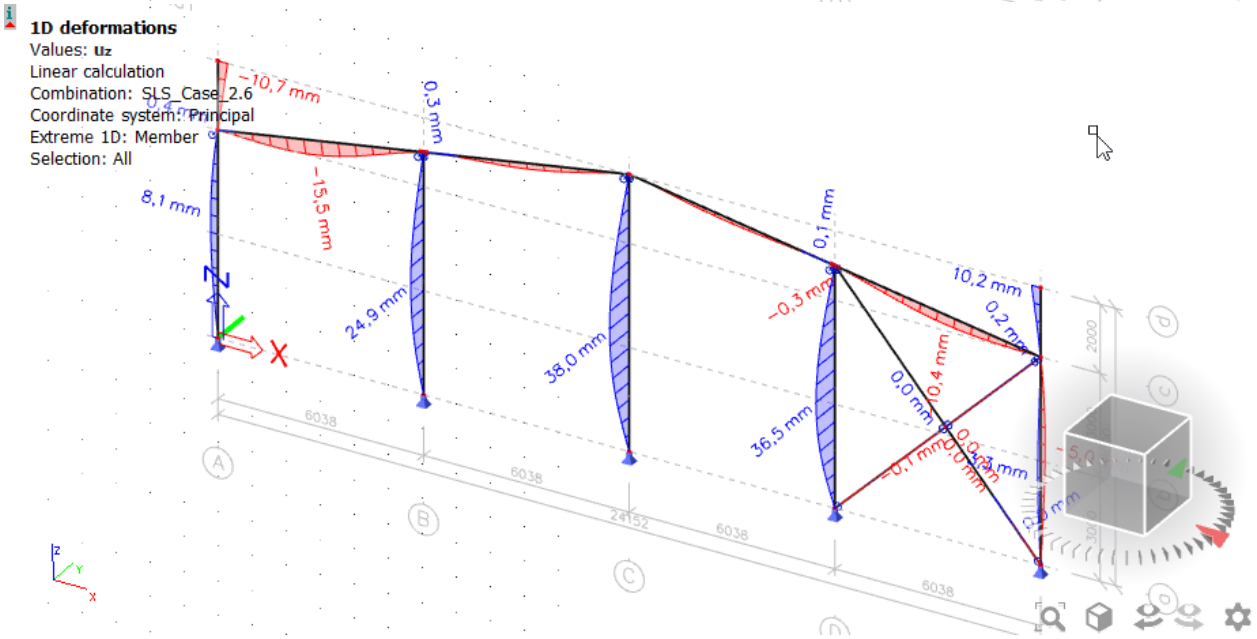

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.1
Coordinate system: Principal
Extreme 1D: Member
Selection: All
−16,4 mm
0,3 mm
9,0 mm
−21,9 mm
−0,9 mm
21,9 mm
22,8 mm
0,5 mm
0,0 mm
12,8 mm
−0,2 mm
0,0 mm
−0,1 mm
14,9 mm
−15,5 mm
0,0 mm
0,0 mm
−0,1 mm
6038
6038
24152
6038
6038

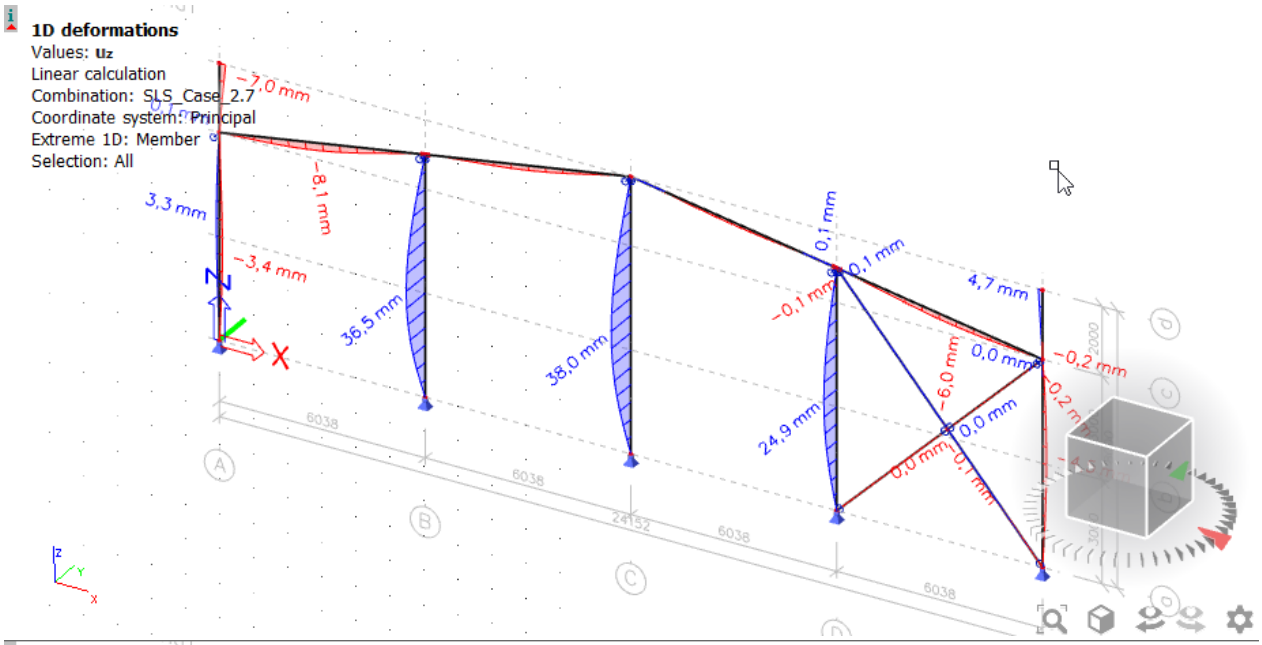

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.2
Coordinate system: Principal
Extreme 1D: Member
Selection: All
−15,7 mm
0,5 mm
13,5 mm
−23,1 mm
−18,9 mm
−19,9 mm
0,4 mm
12,8 mm
−0,2 mm
−18,9 mm
0,0 mm
0,0 mm
−16,3 mm
0,0 mm
0,0 mm
0,0 mm
6038
6038
24152
6038
6038

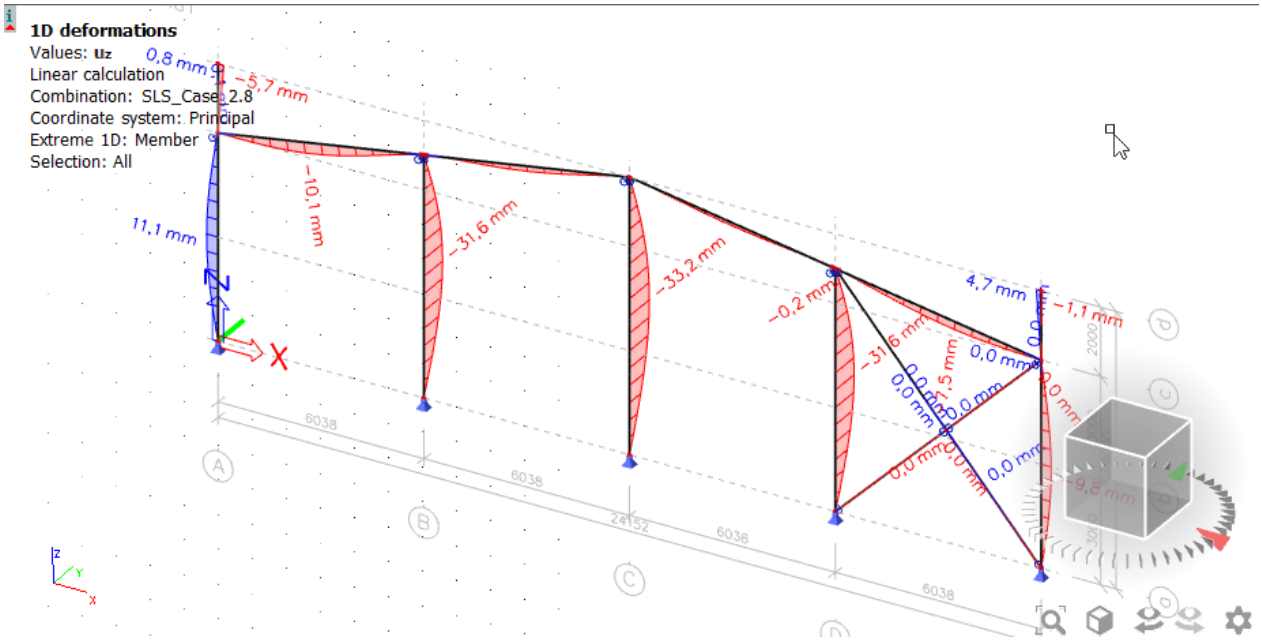

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.3
Coordinate system: Principal
Extreme 1D: Member
Selection: All
-15,7 mm
0,5 mm
10,2 mm
-22,2 mm
14,9 mm
22,8 mm
0,3 mm
-0,3 mm
13,7 mm
0,1 mm
21,9 mm
-0,2 mm
0,0 mm
-0,1 mm
0,0 mm
0,0 mm
6038
6038
24152
6038
6038
A
B
C
D

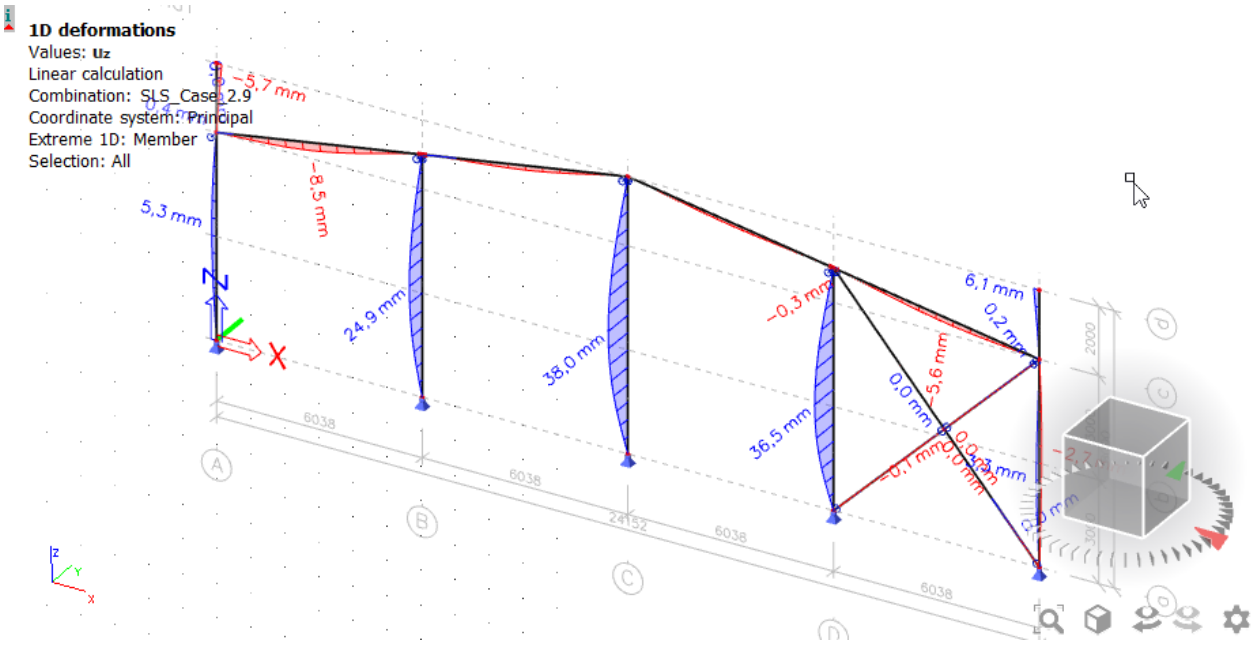

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.4
Coordinate system: Principal
Extreme 1D: Member
Selection: All
-11,9 mm
-15,0 mm
6,2 mm
-3,4 mm
36,5 mm
38,0 mm
0,3 mm
-0,1 mm
0,1 mm
8,8 mm
24,9 mm
-10,8 mm
0,0 mm
-0,2 mm
0,0 mm
0,0 mm
-0,1 mm
6038
6038
24152
6038
6038
A
B
C
D


1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.5
Coordinate system: Principal
Extreme 1D: Member
Selection: All
0,8 mm
−10,7 mm
0,3 mm
13,9 mm
−17,0 mm
−31,6 mm
−33,2 mm
0,2 mm
−0,2 mm
8,8 mm
−1,1 mm
0,0 mm
−12,0 mm
6038
24152

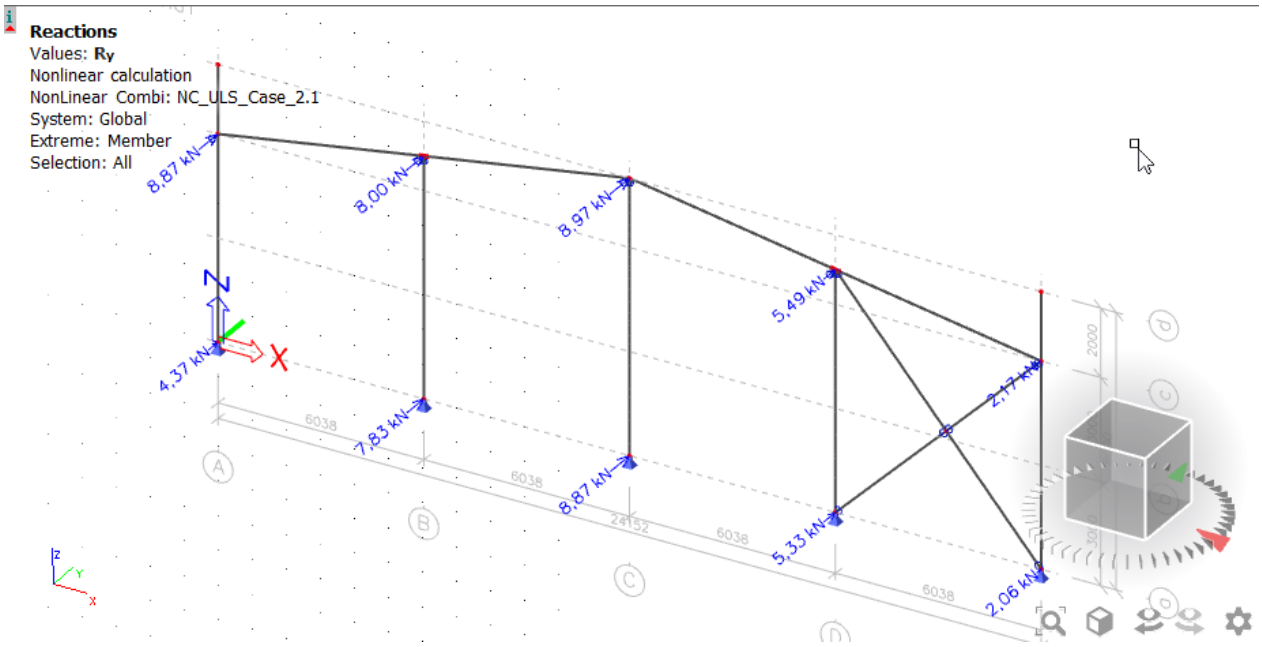

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.6
Coordinate system: Principal
Extreme 1D: Member
Selection: All
−10,7 mm
0,3 mm
8,1 mm
−15,5 mm
24,9 mm
38,0 mm
0,1 mm
−0,3 mm
10,2 mm
0,2 mm
36,5 mm
0,0 mm
−5,0 mm
6038
24152

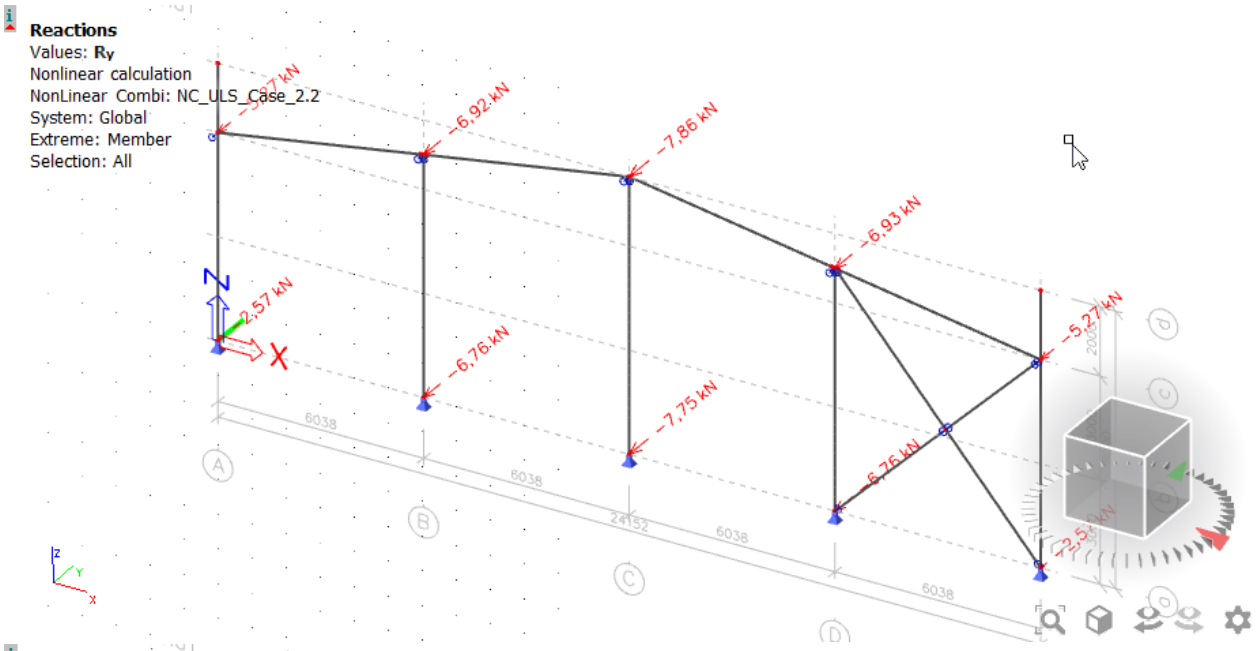

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.7
Coordinate system: Principal
Extreme 1D: Member
Selection: All
-7,0 mm
-8,1 mm
3,3 mm
-3,4 mm
36,5 mm
38,0 mm
0,1 mm
0,1 mm
-0,1 mm
4,7 mm
-6,0 mm
0,0 mm
-0,2 mm
24,9 mm
0,0 mm
0,0 mm
6038
6038
24152
6038
6038

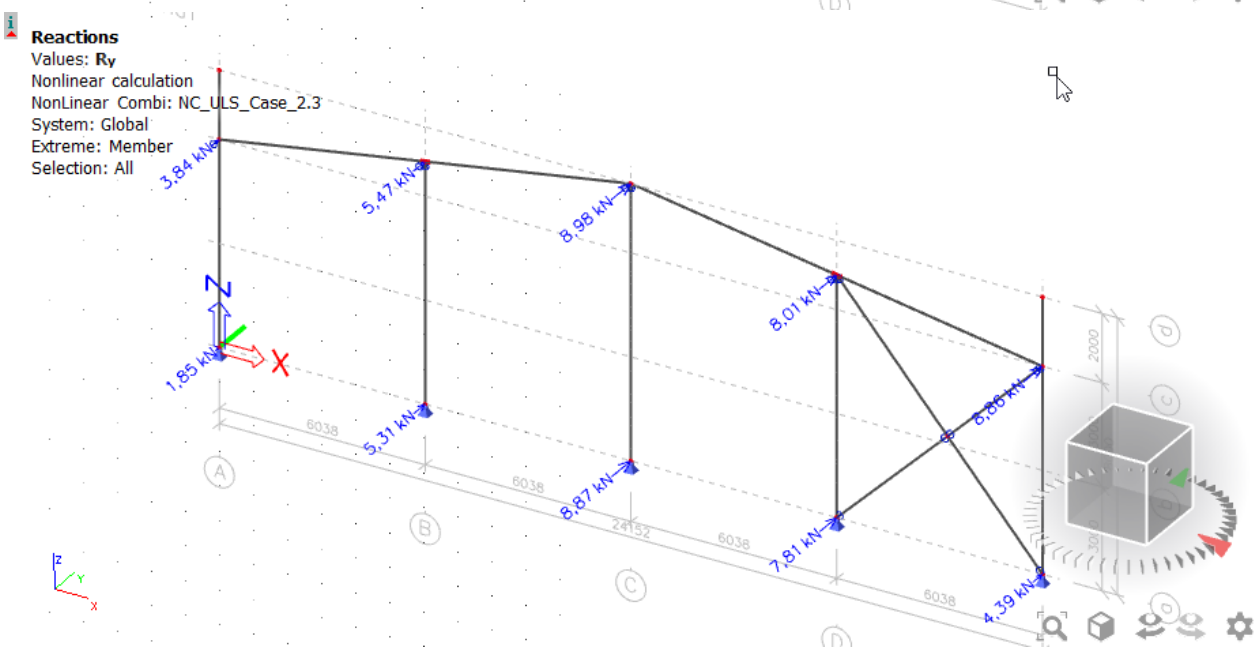

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case_2.8
Coordinate system: Principal
Extreme 1D: Member
Selection: All
0,8 mm
-5,7 mm
-10,1 mm
11,1 mm
-31,6 mm
-33,2 mm
-0,2 mm
4,7 mm
-1,1 mm
-31,6 mm
-7,5 mm
0,0 mm
0,0 mm
0,0 mm
0,0 mm
0,0 mm
0,0 mm
0,0 mm
9,8 mm
6038
6038
24152
6038
6038

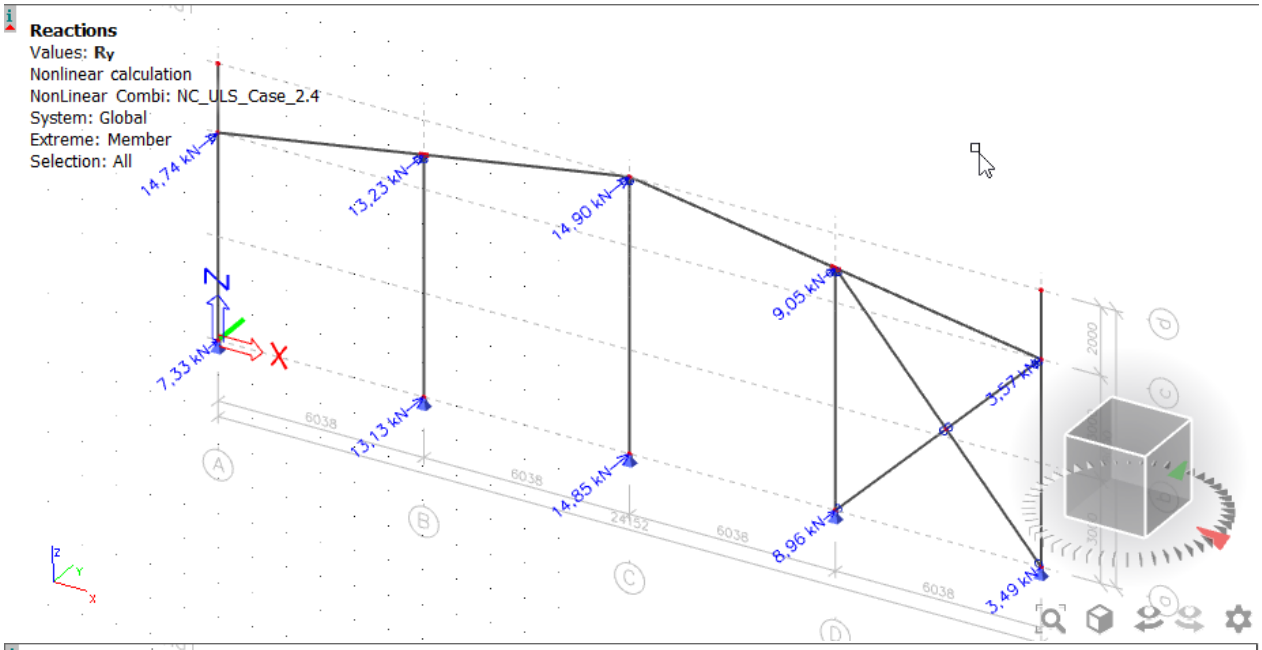

1D deformations
Values: uz
Linear calculation
Combination: SLS_Case 2.9
Coordinate system: Principal
Extreme 1D: Member
Selection: All
-5,7 mm
-8,5 mm
5,3 mm
24,9 mm
38,0 mm
-0,3 mm
6,1 mm
0,2 mm
-5,6 mm
0,0 mm
36,5 mm
-0,1 mm
6038
6038
24152
6038
A
B
C
D

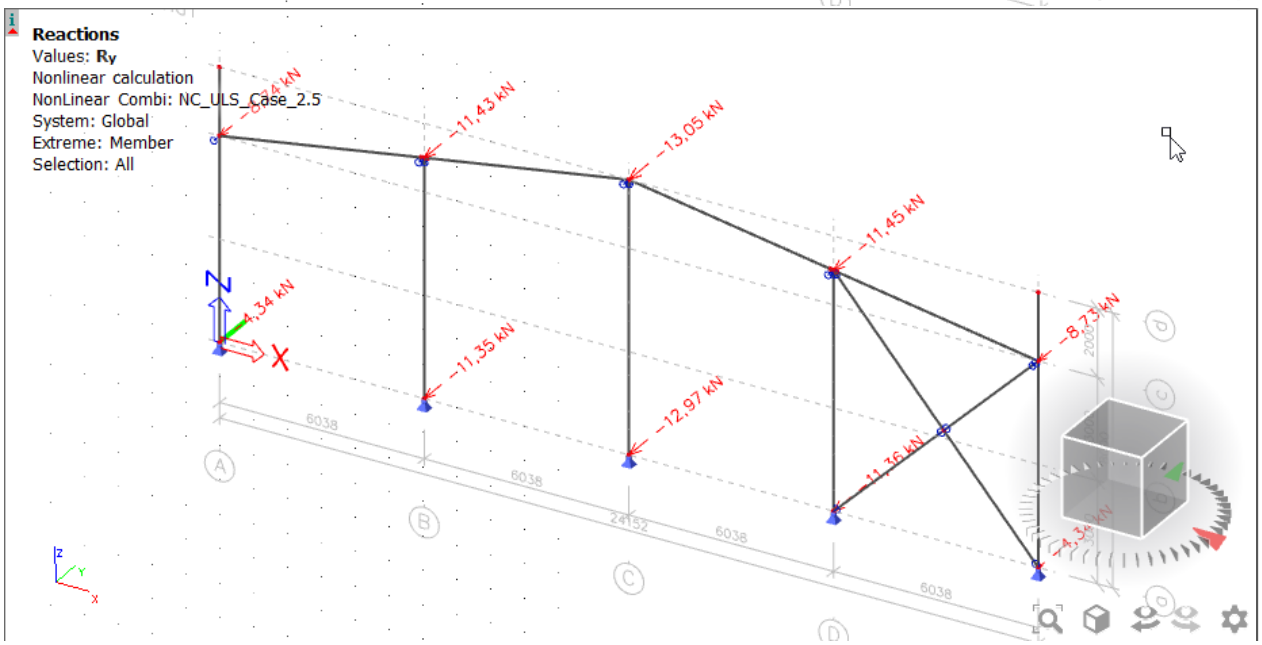
A axis - Reaction forces along Y direction

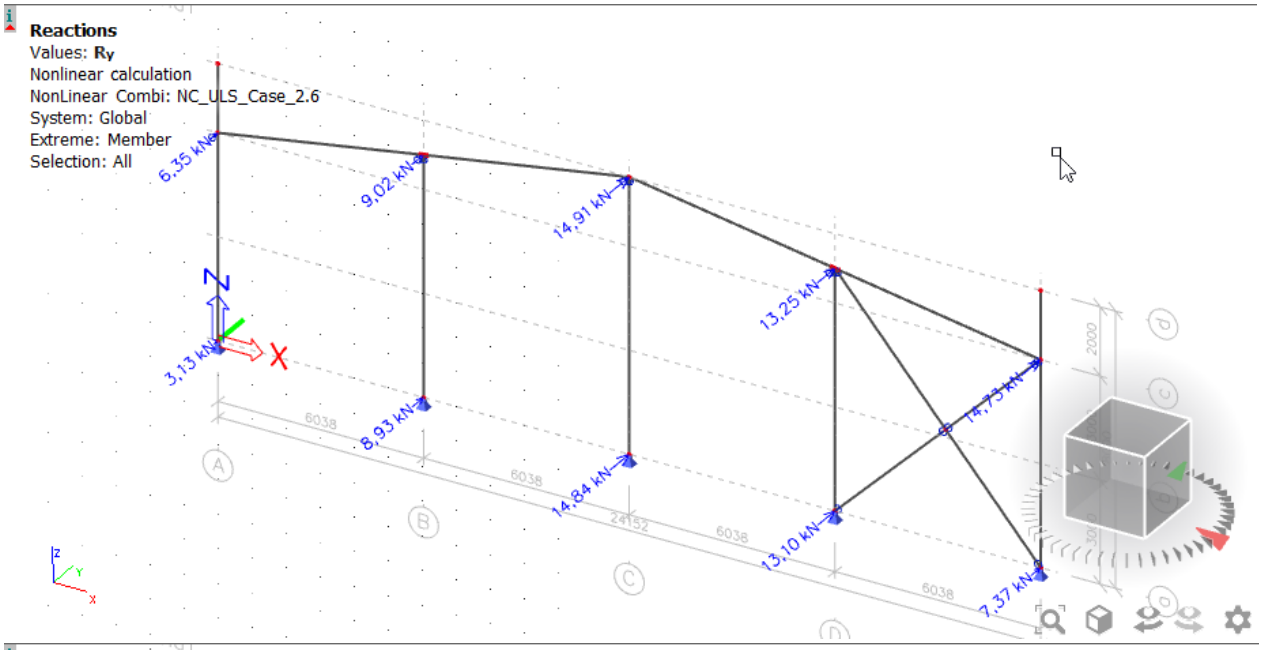


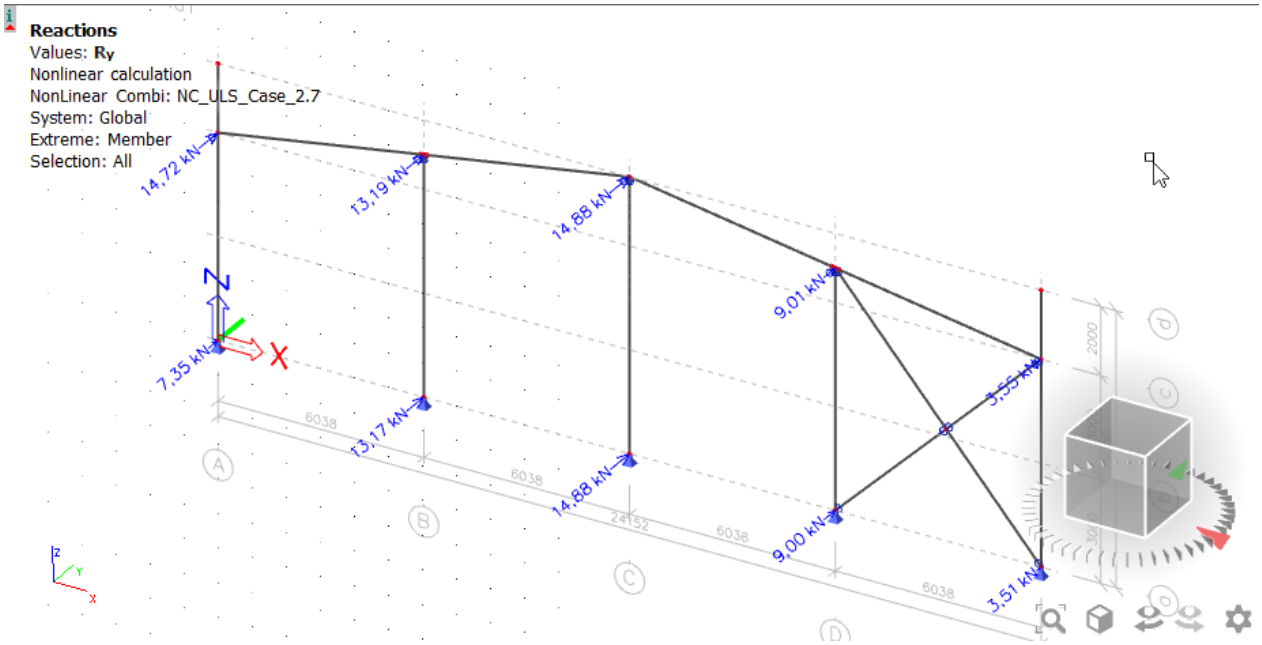

Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.2
System: Global
Extreme: Member
Selection: All
-6,92 kN
-7,86 kN
-6,93 kN
-5,27 kN
2,57 kN
-6,76 kN
-7,75 kN
6,76 kN
2,57 kN
6038
6038
24152
6038
6038
A
B
C
D

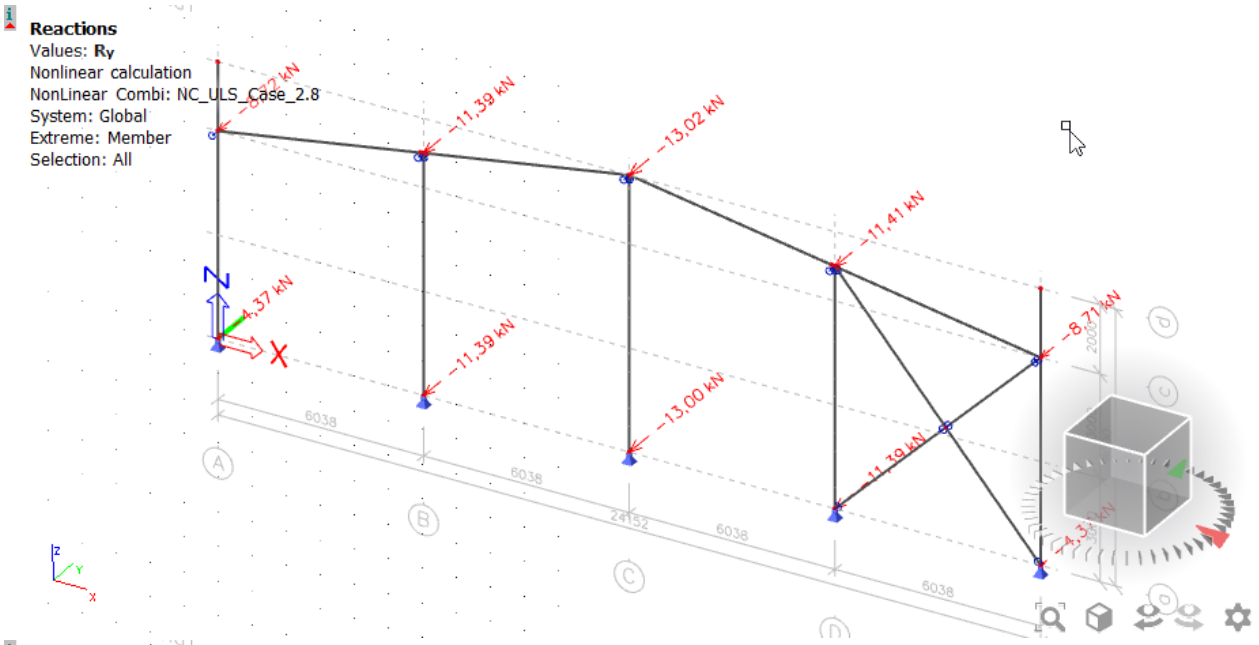

Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.3
System: Global
Extreme: Member
Selection: All
3,84 kN
5,47 kN
8,98 kN
8,01 kN
6,86 kN
1,85 kN
5,31 kN
8,87 kN
7,81 kN
4,39 kN
6038
6038
24152
6038
6038
A
B
C
D

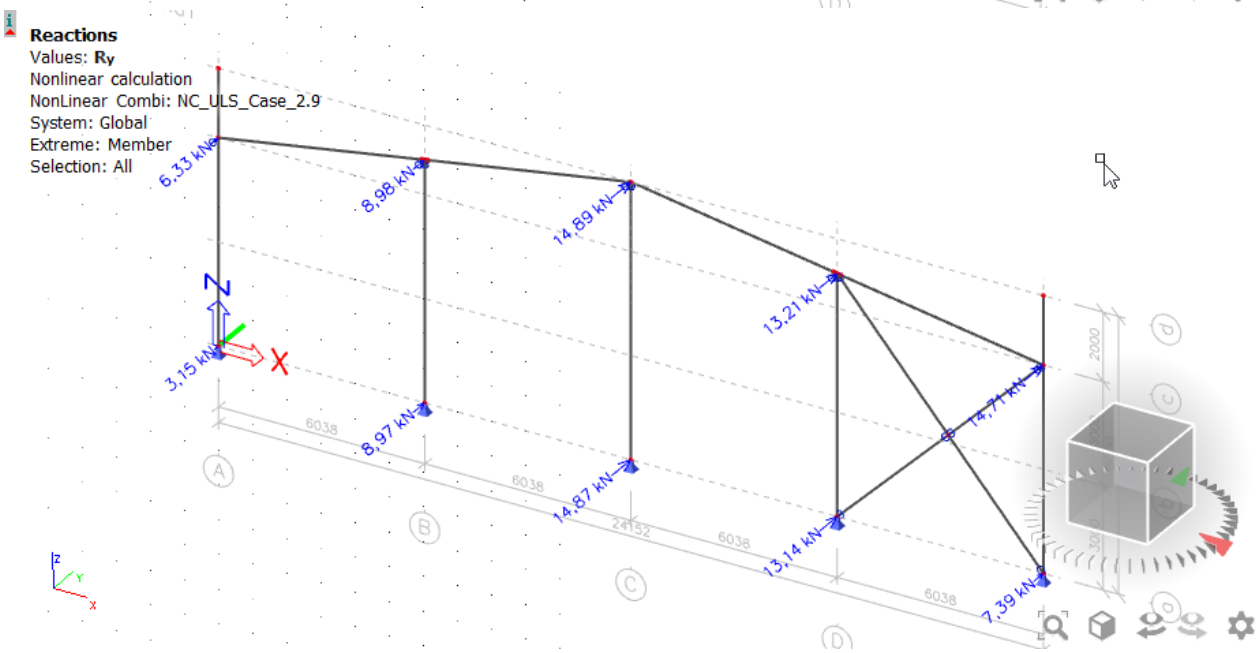

Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.4
System: Global
Extreme: Member
Selection: All
14,74 kN
13,23 kN
14,90 kN
9,05 kN
7,33 kN
13,13 kN
14,85 kN
8,96 kN
3,49 kN
6038
6038
24152
6038
6038
A
B
C
D


Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.5
System: Global
Extreme: Member
Selection: All
−11,43 kN
−13,05 kN
−11,45 kN
−4,34 kN
−11,35 kN
−12,97 kN
−11,36 kN
6038
6038
24152
6038
6038
A
B
C
D


Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.6
System: Global
Extreme: Member
Selection: All
6,35 kN
9,02 kN
14,91 kN
13,25 kN
14,75 kN
3,13 kN
8,93 kN
14,84 kN
13,10 kN
7,37 kN
6038
6038
24152
6038
6038
2000
A
B
C
D

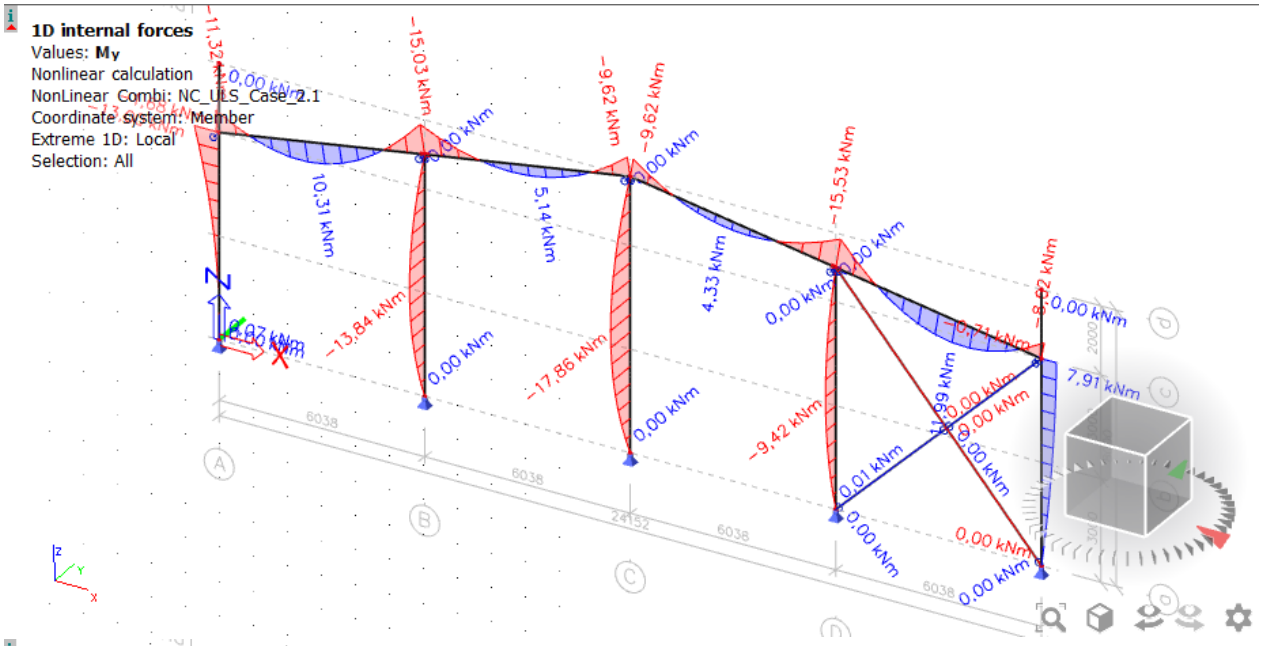

Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.7
System: Global
Extreme: Member
Selection: All
14,72 kN
13,19 kN
14,88 kN
9,01 kN
3,55 kN
7,35 kN
13,17 kN
14,88 kN
9,00 kN
3,51 kN
6038
6038
24152
6038
6038
2000
A
B
C
D

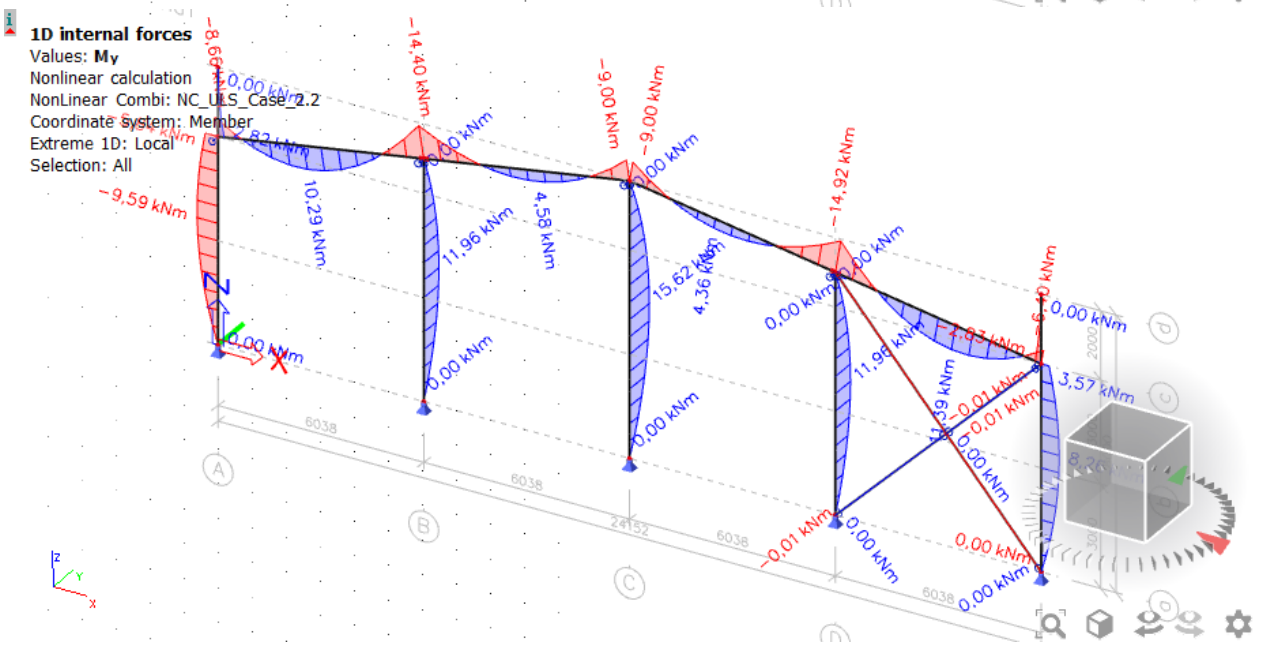

Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.8
System: Global
Extreme: Member
Selection: All
-11,39 kN
-13,02 kN
-11,41 kN
-8,71 kN
4,37 kN
-11,39 kN
-13,00 kN
6038
6038
24152
6038
6038
A
B
C
D

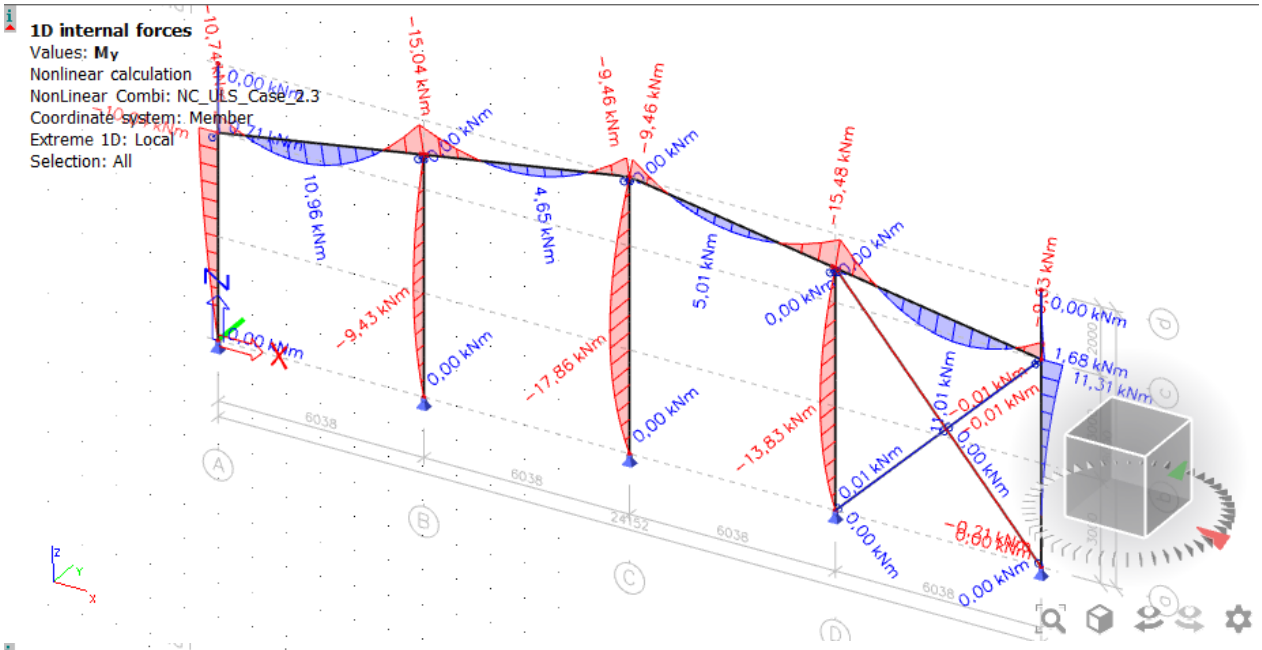

Reactions
Values: Ry
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.9
System: Global
Extreme: Member
Selection: All
6,33 kN
8,98 kN
14,89 kN
13,21 kN
14,71 kN
3,15 kN
8,97 kN
14,87 kN
13,14 kN
7,39 kN
6038
6038
24152
6038
6038
A
B
C
D

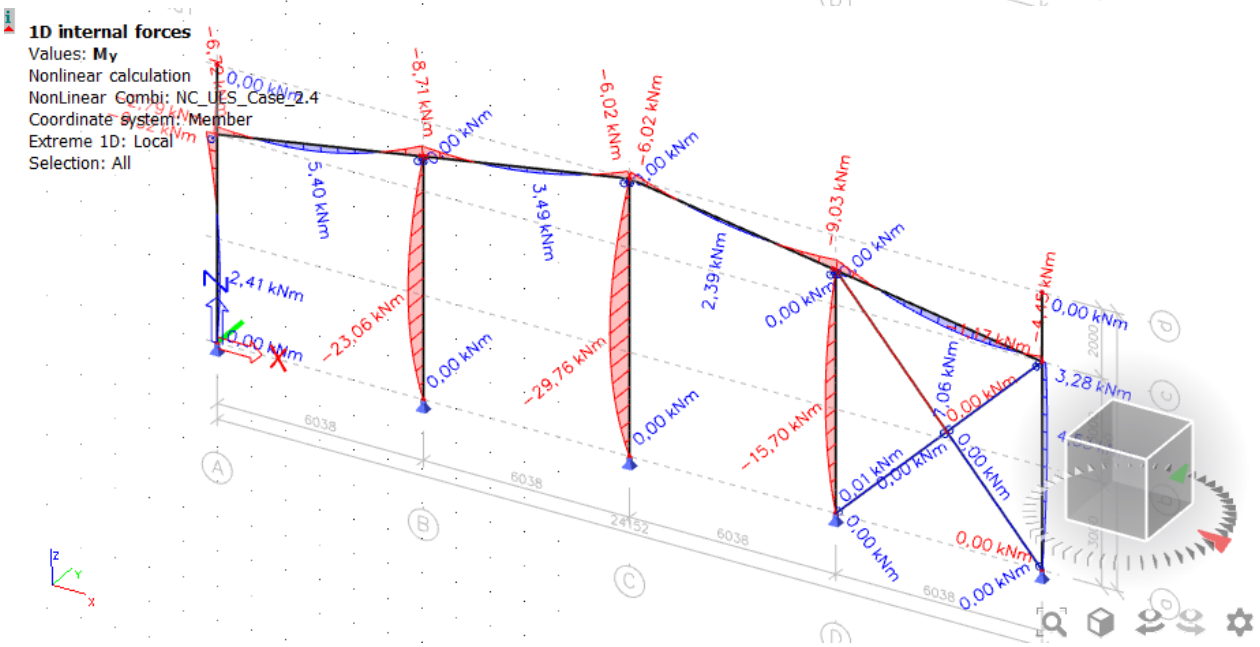
A5

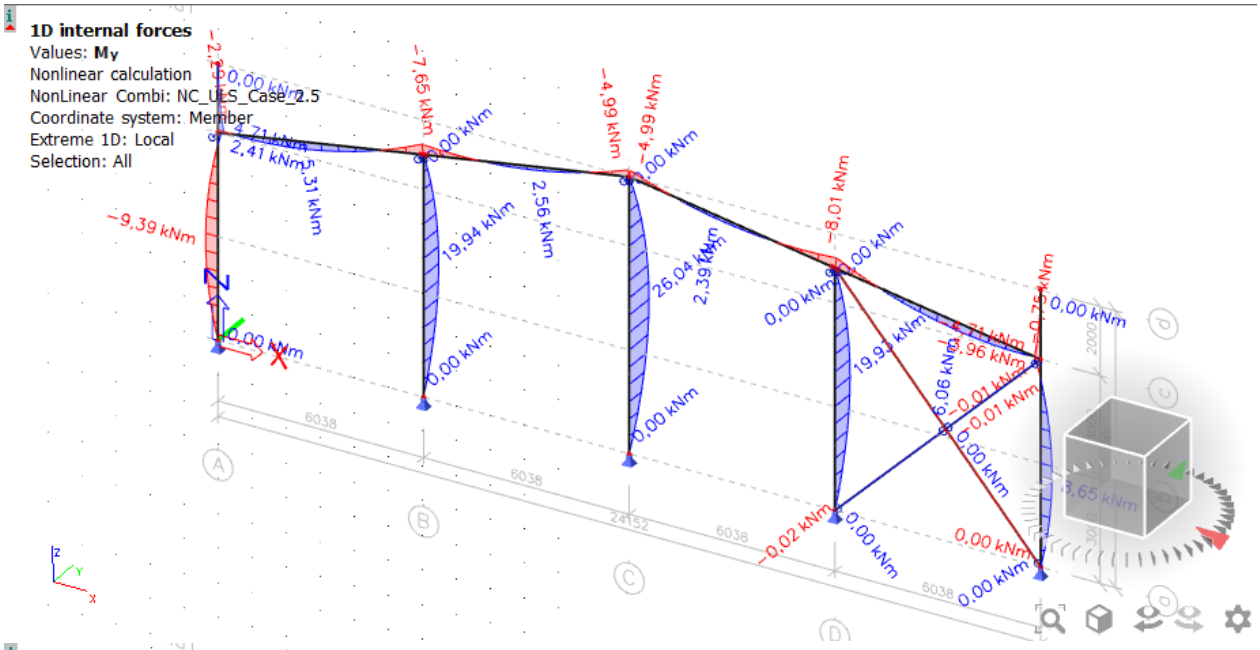
A axis - M_y moment resistances

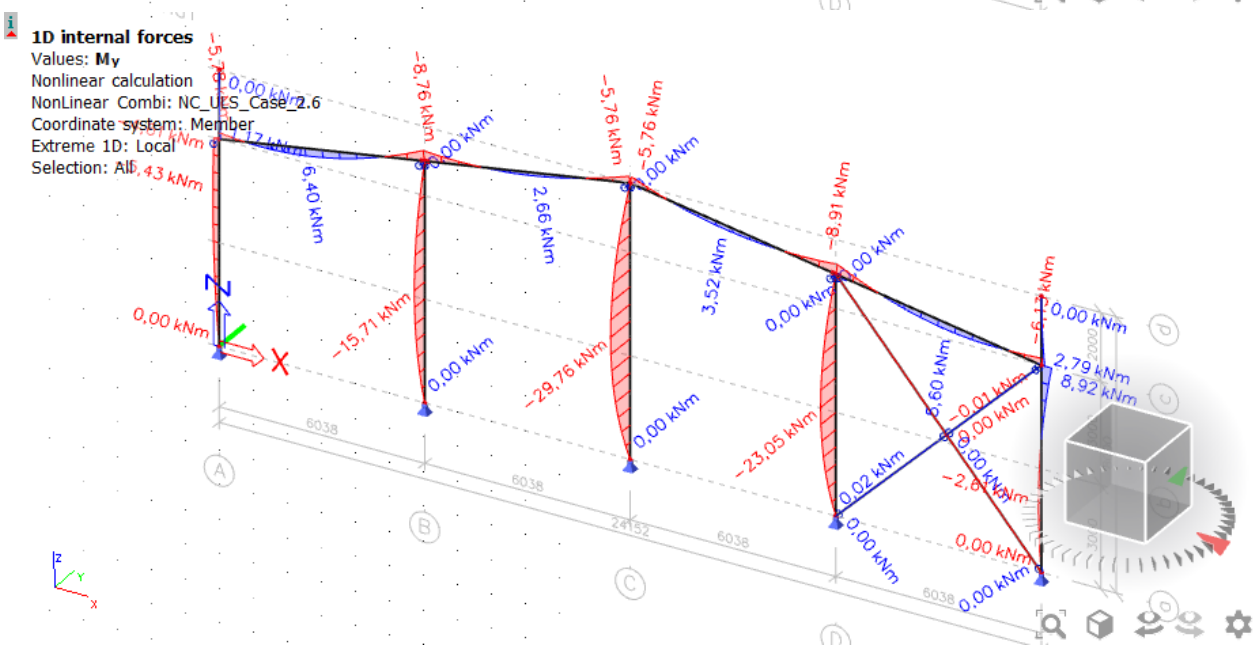


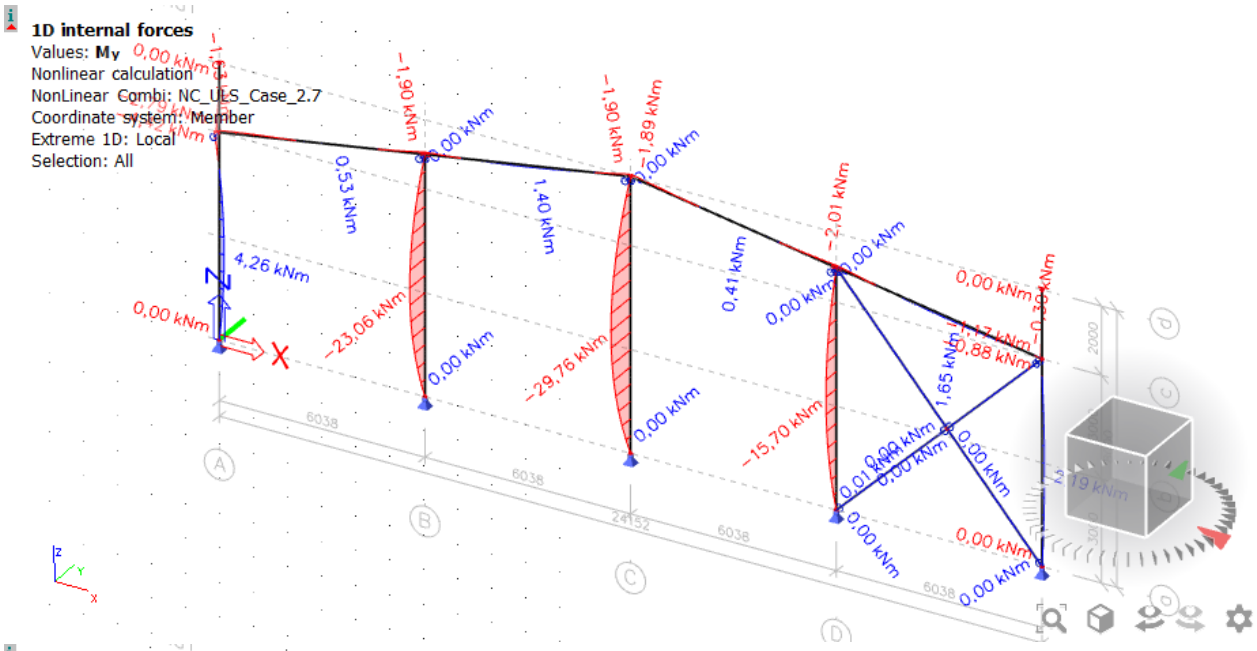


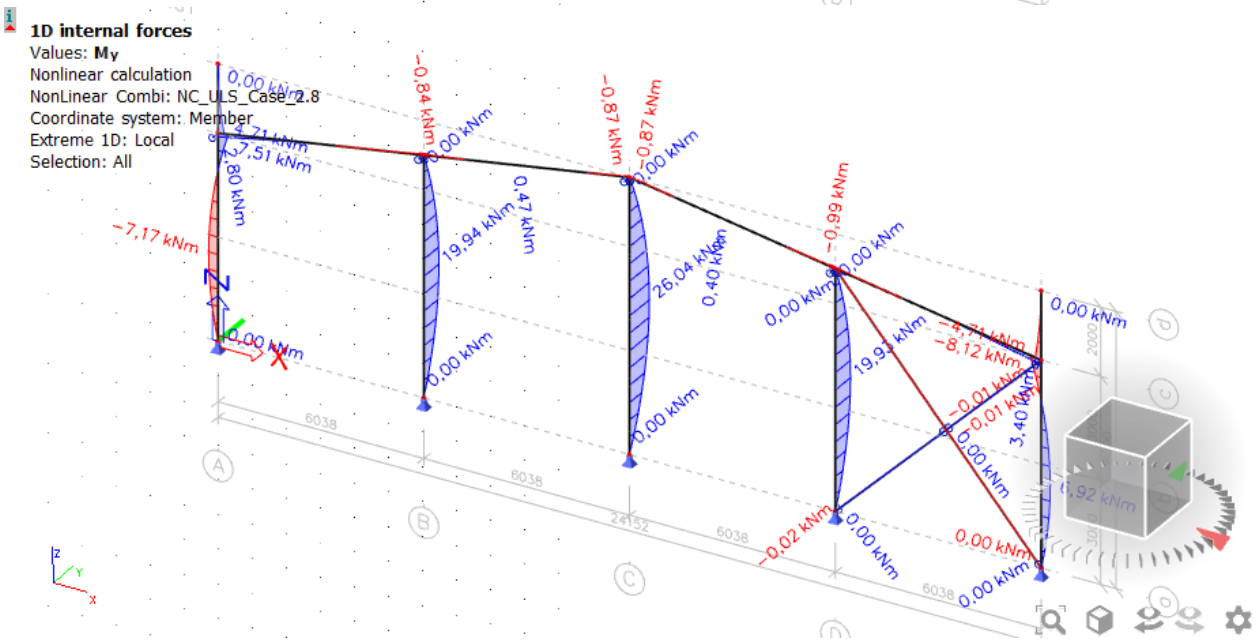

1D internal forces
Values: My
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.3
Coordinate system: Member
Extreme 1D: Local
Selection: All
−10,74 kNm
−15,04 kNm
−9,46 kNm
−9,46 kNm
−15,48 kNm
−9,03 kNm
10,96 kNm
4,65 kNm
5,01 kNm
−9,43 kNm
−17,86 kNm
−13,83 kNm
1,68 kNm
11,31 kNm
6038
6038
24152
6038
A
B
C
D

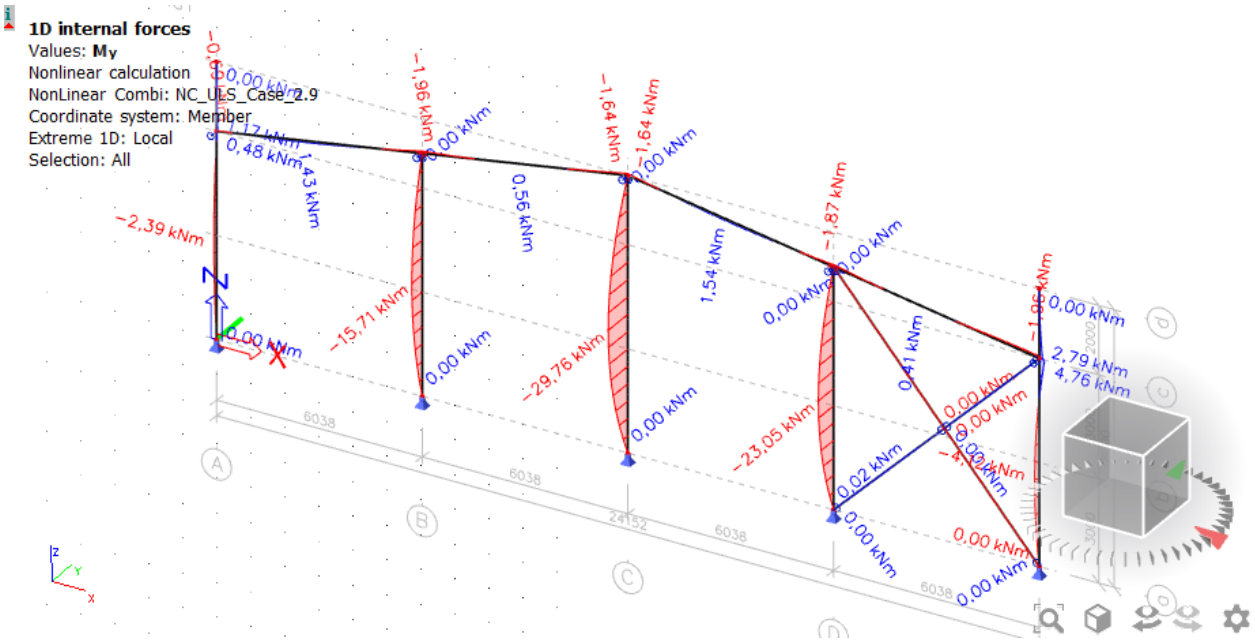

1D internal forces
Values: My
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.4
Coordinate system: Member
Extreme 1D: Local
Selection: All
−8,71 kNm
−6,02 kNm
−6,02 kNm
−9,03 kNm
5,40 kNm
3,49 kNm
2,39 kNm
2,41 kNm
−23,06 kNm
−29,76 kNm
−15,70 kNm
3,28 kNm
6038
6038
24152
6038
A
B
C
D


1D internal forces
Values: My
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.5
Coordinate system: Member
Extreme 1D: Local
Selection: All
-9,39 kNm
2,41 kNm
-7,65 kNm
19,94 kNm
2,56 kNm
-4,99 kNm
26,04 kNm
2,39 kNm
-8,01 kNm
19,93 kNm
-0,96 kNm
-0,01 kNm
-0,02 kNm
0,00 kNm
6038
24152

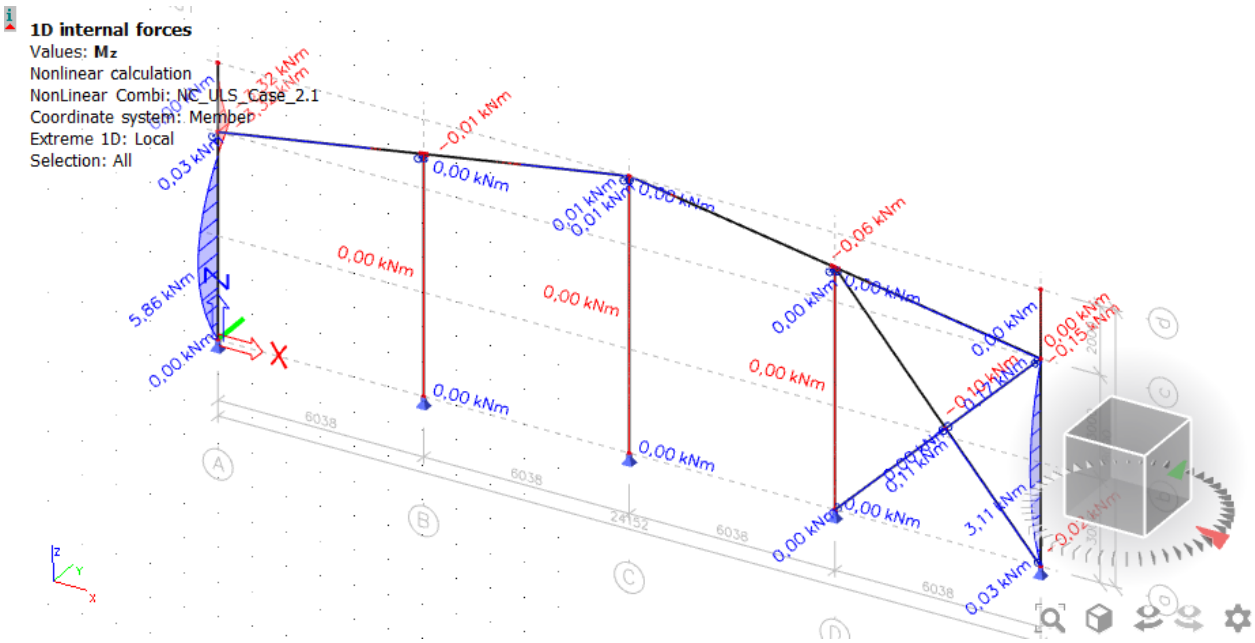

1D internal forces
Values: My
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.6
Coordinate system: Member
Extreme 1D: Local
Selection: All
-8,76 kNm
6,40 kNm
-15,71 kNm
2,66 kNm
-5,76 kNm
-29,76 kNm
3,52 kNm
-8,91 kNm
-23,05 kNm
2,79 kNm
8,92 kNm
0,00 kNm
6038
24152

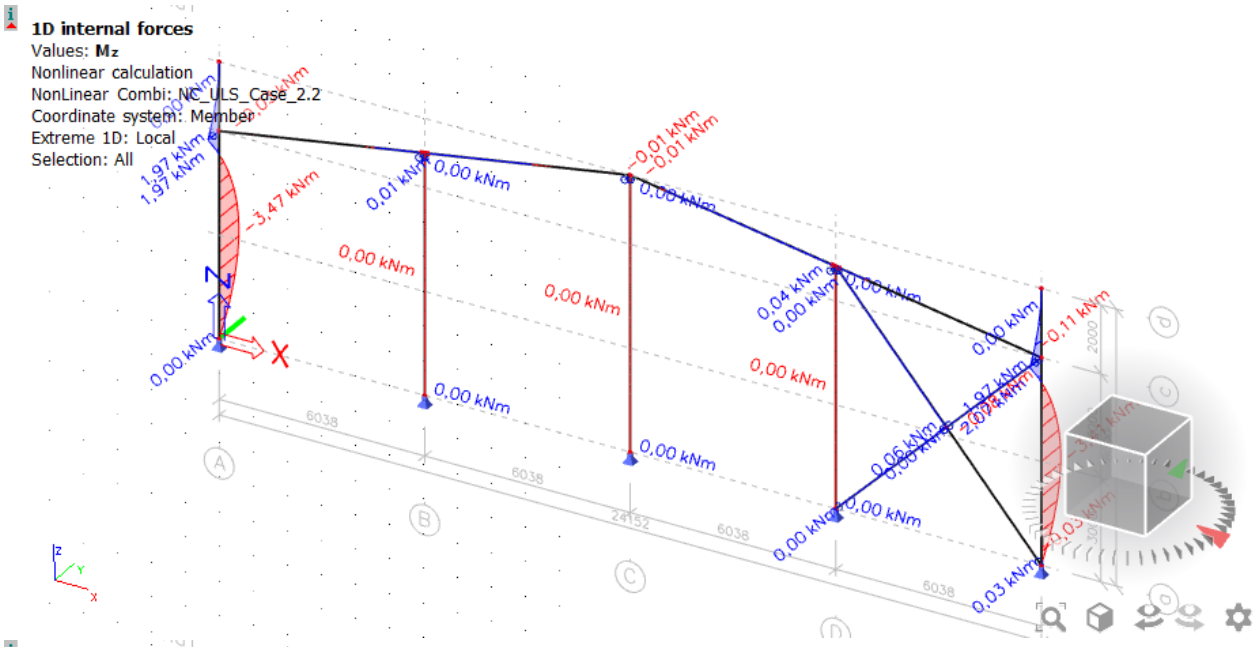

1D internal forces
Values: My
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.7
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kNm
-1,90 kNm
0,53 kNm
1,40 kNm
1,89 kNm
-2,01 kNm
0,41 kNm
4,26 kNm
-23,06 kNm
-29,76 kNm
-15,70 kNm
1,65 kNm
-0,30 kNm
6038
24152

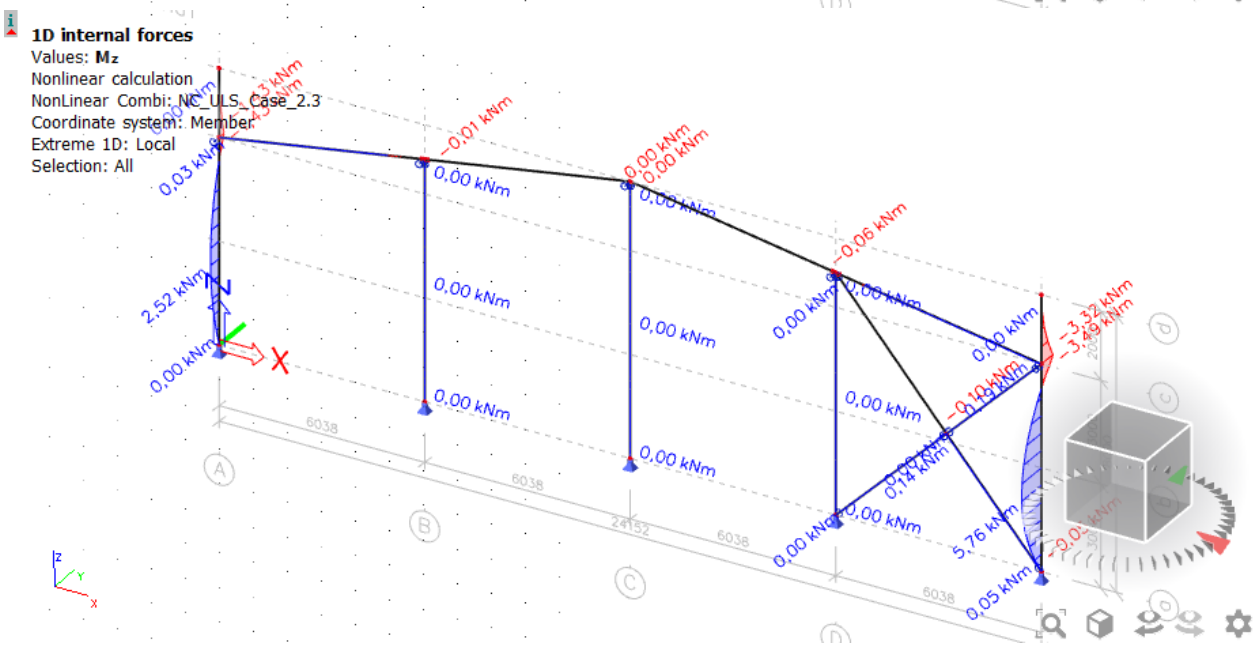

1D internal forces
Values: My
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.8
Coordinate system: Member
Extreme 1D: Local
Selection: All
-0,84 kNm
-0,87 kNm
-0,99 kNm
-7,51 kNm
-7,17 kNm
19,94 kNm
0,47 kNm
26,04 kNm
0,40 kNm
-8,12 kNm
3,40 kNm
6038
24152

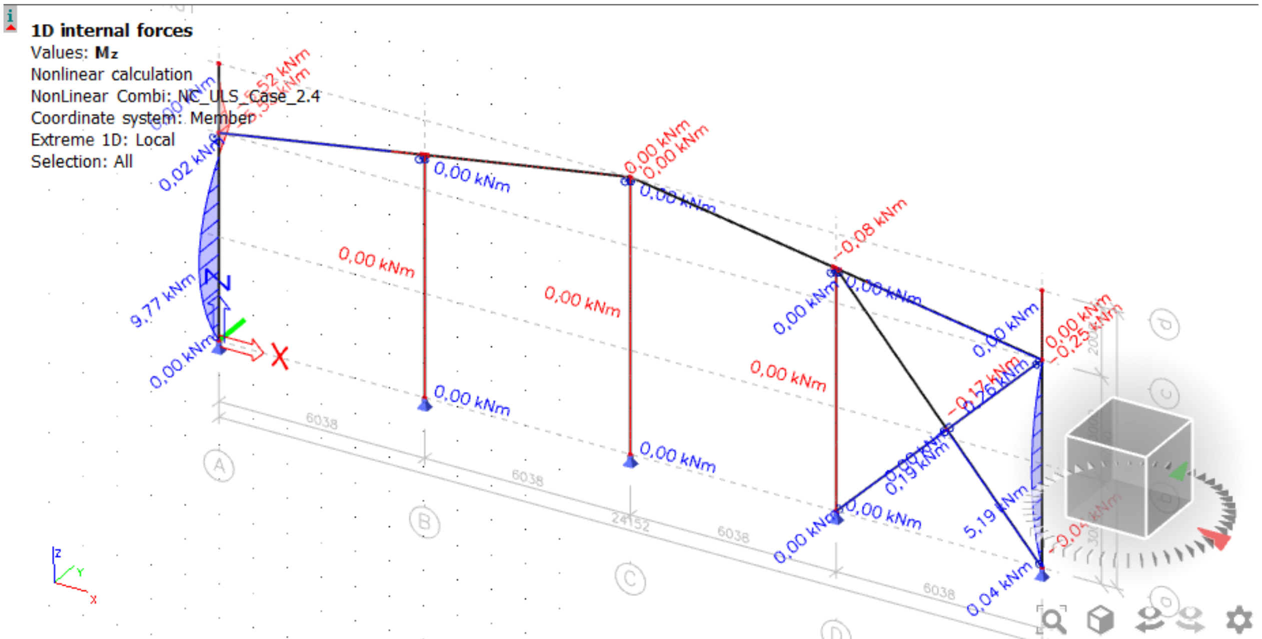


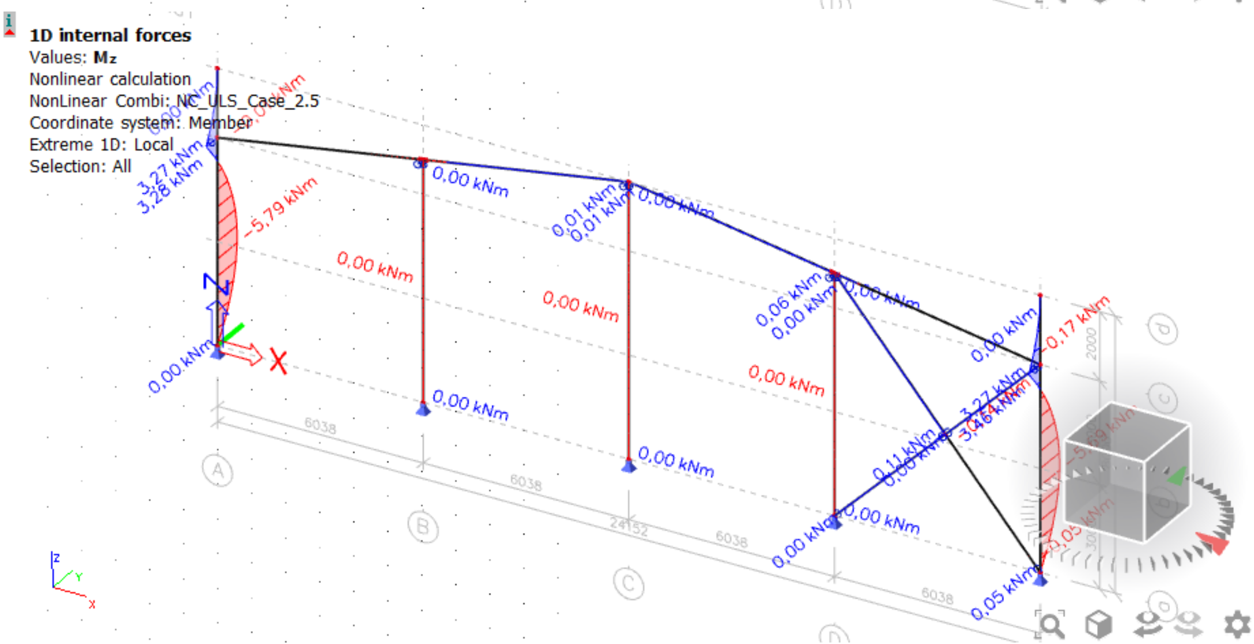
A axis – M_z moment resistances

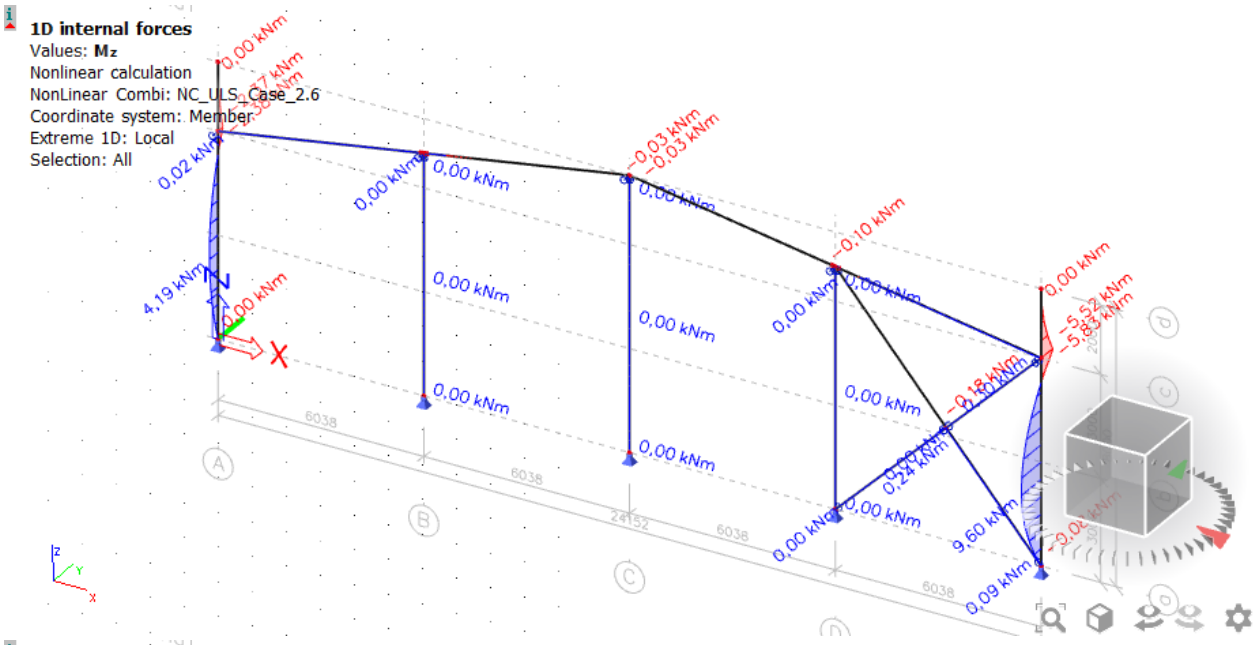


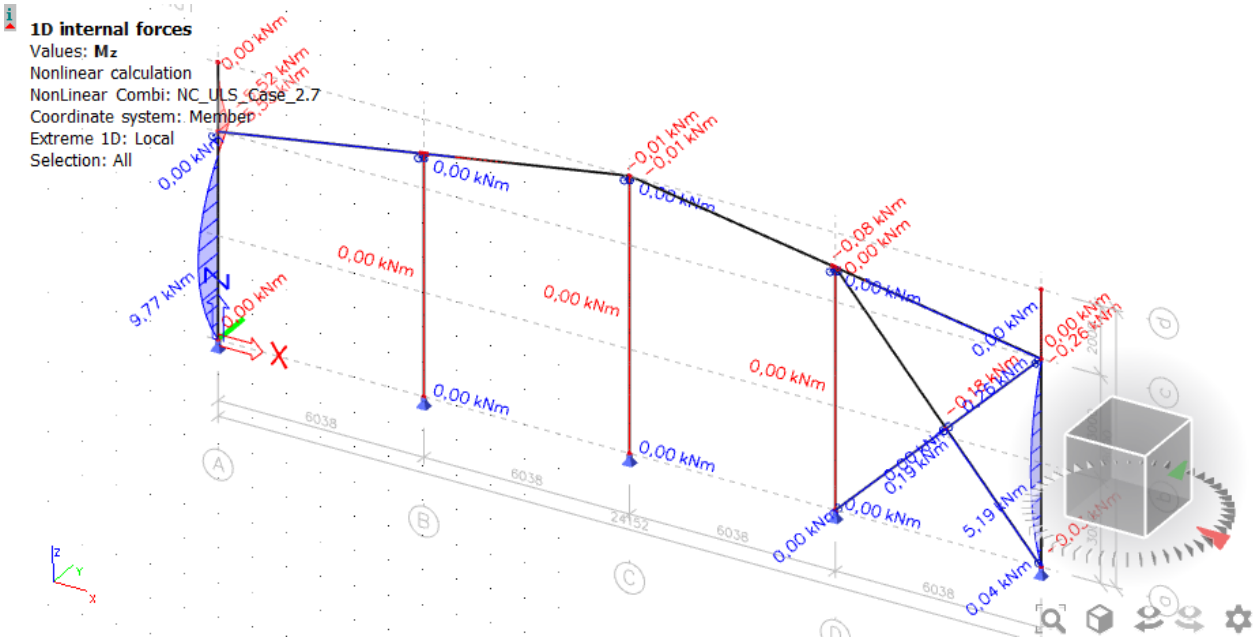

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.2
Coordinate system: Member
Extreme 1D: Local
Selection: All
1,97 kNm
1,97 kNm
-3,47 kNm
0,00 kNm
0,01 kNm
-0,01 kNm
-0,01 kNm
0,04 kNm
0,00 kNm
-0,11 kNm
0,06 kNm
0,03 kNm
6038
24152
A
B
C
D

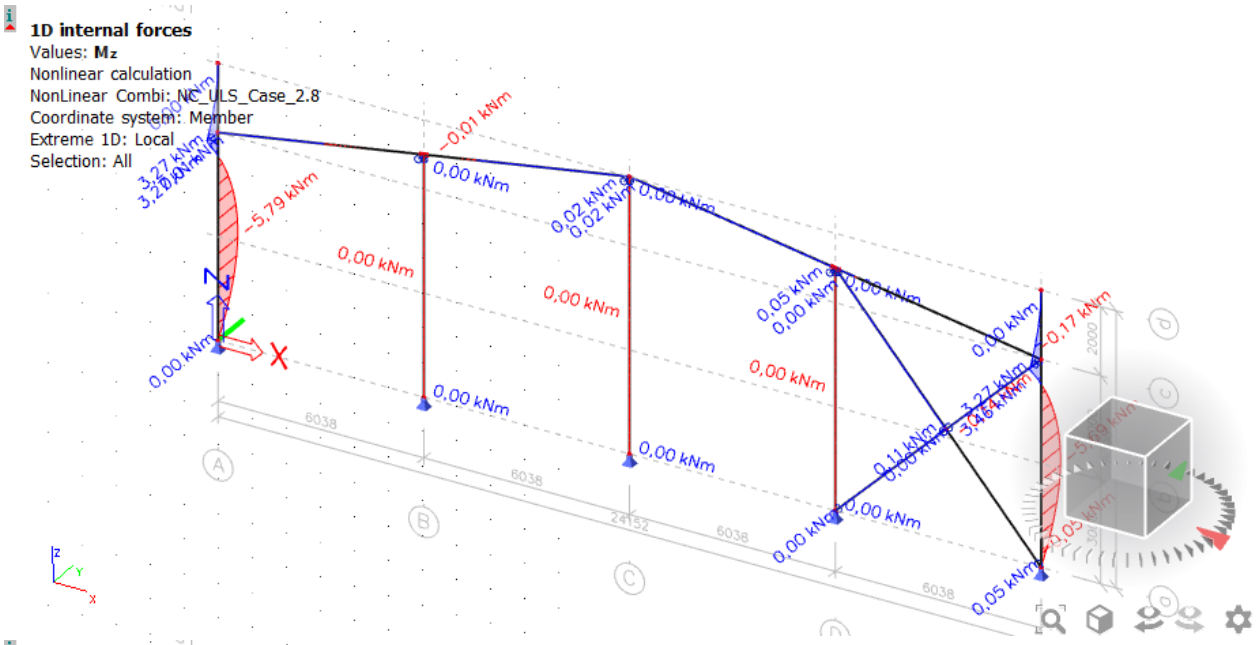

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.3
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,03 kNm
2,52 kNm
0,00 kNm
-0,01 kNm
0,00 kNm
-0,06 kNm
-3,32 kNm
-3,49 kNm
0,14 kNm
5,76 kNm
0,05 kNm
6038
24152
A
B
C
D

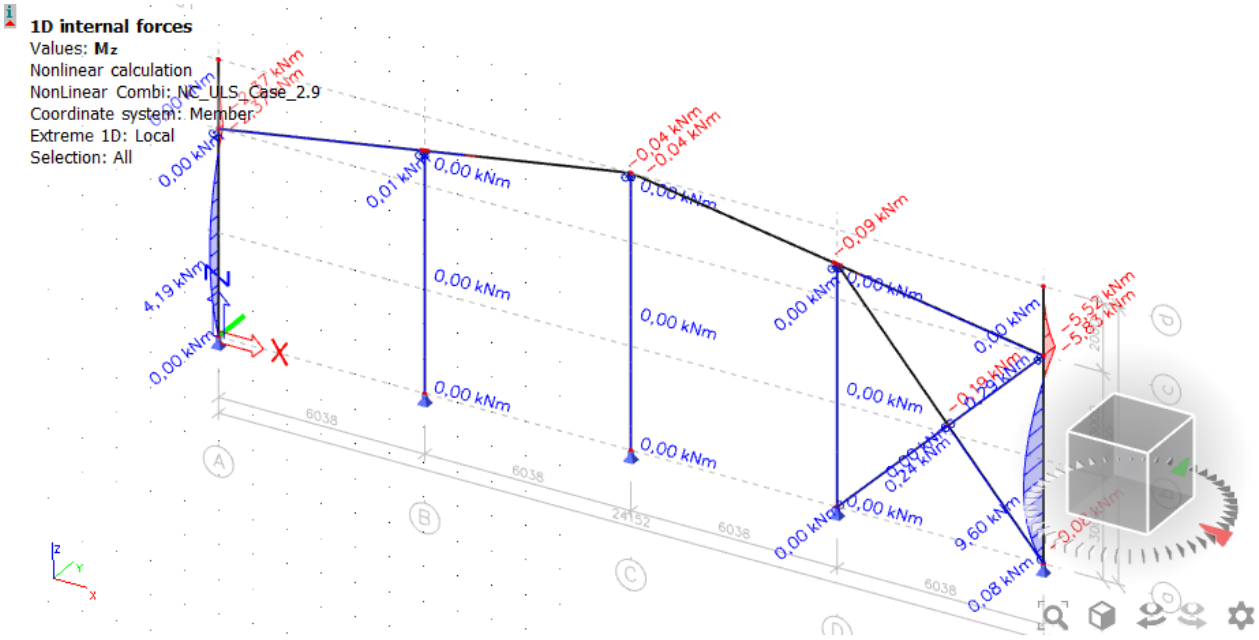

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.4
Coordinate system: Member
Extreme 1D: Local
Selection: All


1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.5
Coordinate system: Member
Extreme 1D: Local
Selection: All

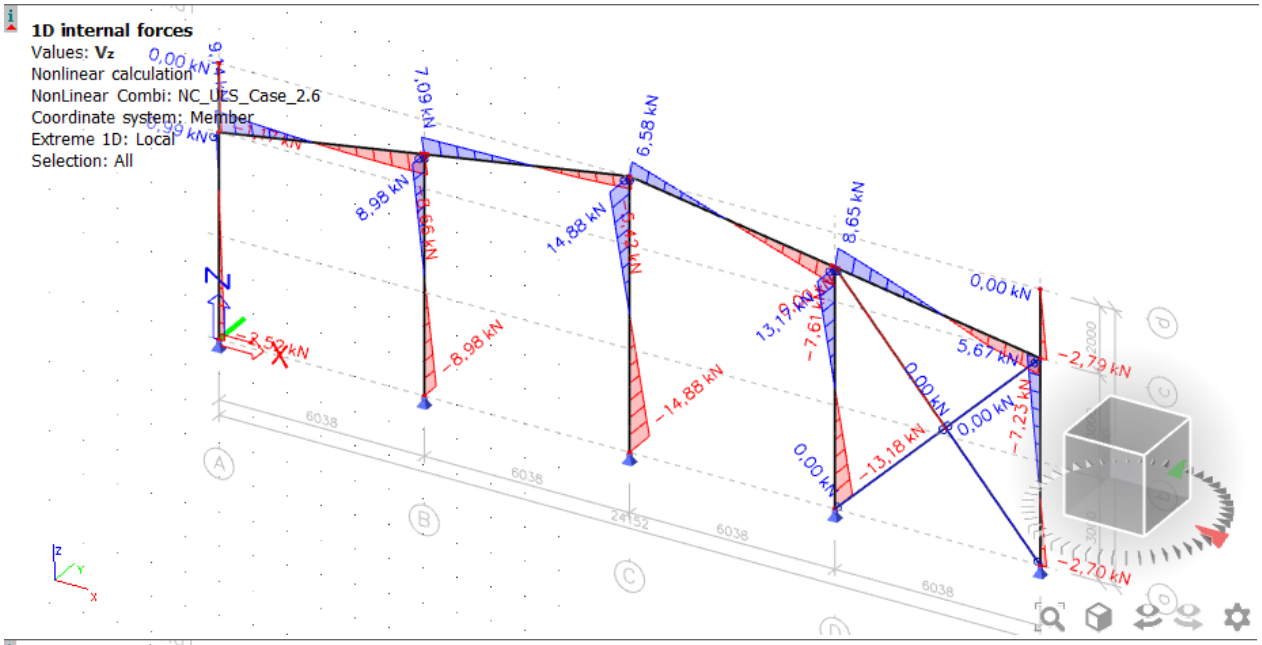

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.6
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kNm
0,02 kNm
4,19 kNm
-0,03 kNm
-0,10 kNm
-0,18 kNm
0,24 kNm
9,60 kNm
0,09 kNm
-5,52 kNm
-5,83 kNm
6038
24152
A
B
C
D

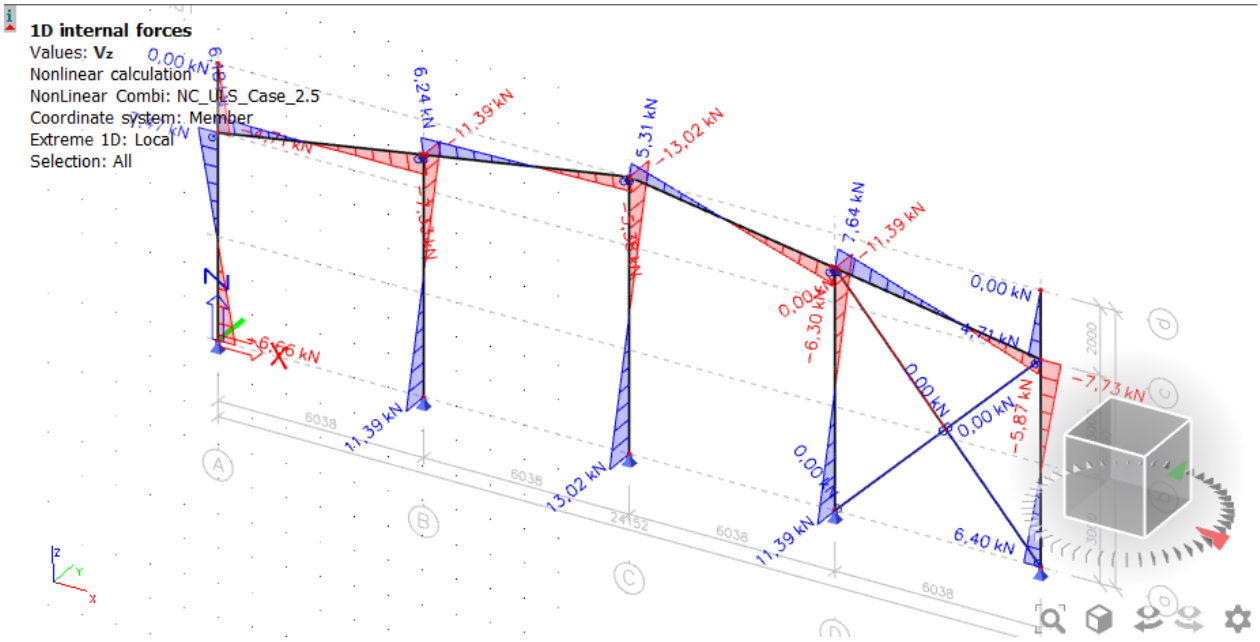

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.7
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kNm
9,77 kNm
-0,01 kNm
-0,08 kNm
0,19 kNm
5,19 kNm
0,04 kNm
-0,26 kNm
6038
24152
A
B
C
D

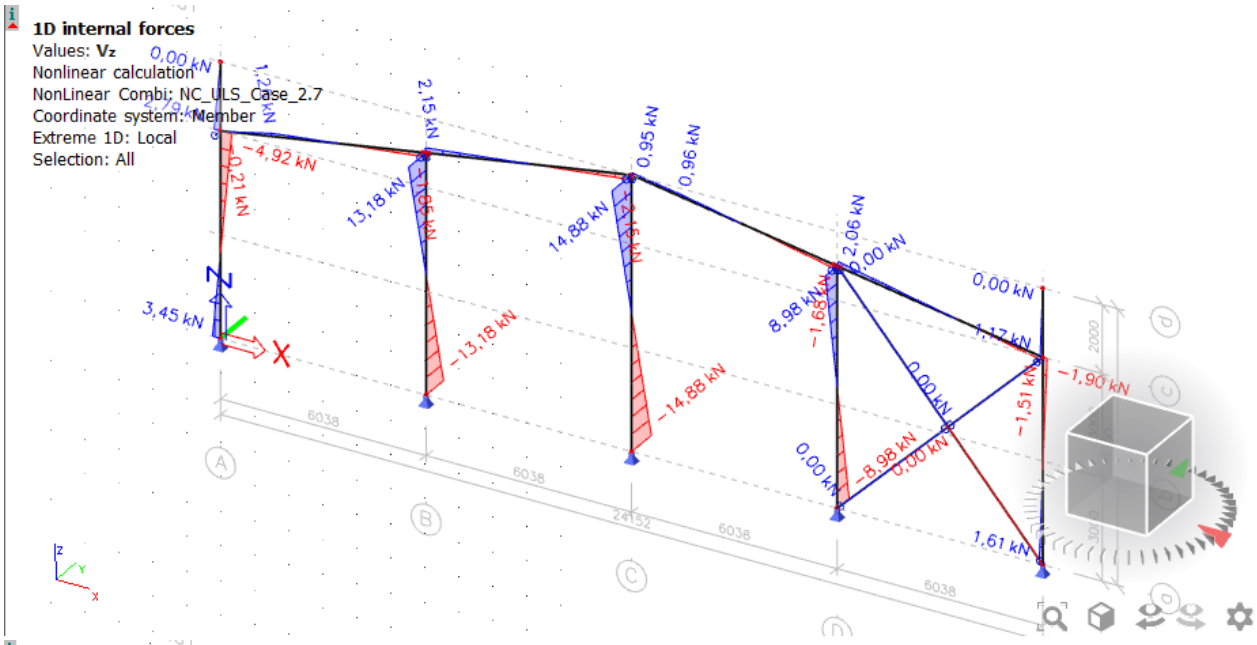

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.8
Coordinate system: Member
Extreme 1D: Local
Selection: All
-5,79 kNm
-0,01 kNm
0,00 kNm
0,02 kNm
0,05 kNm
-0,17 kNm
3,46 kNm
0,11 kNm
6038
24152

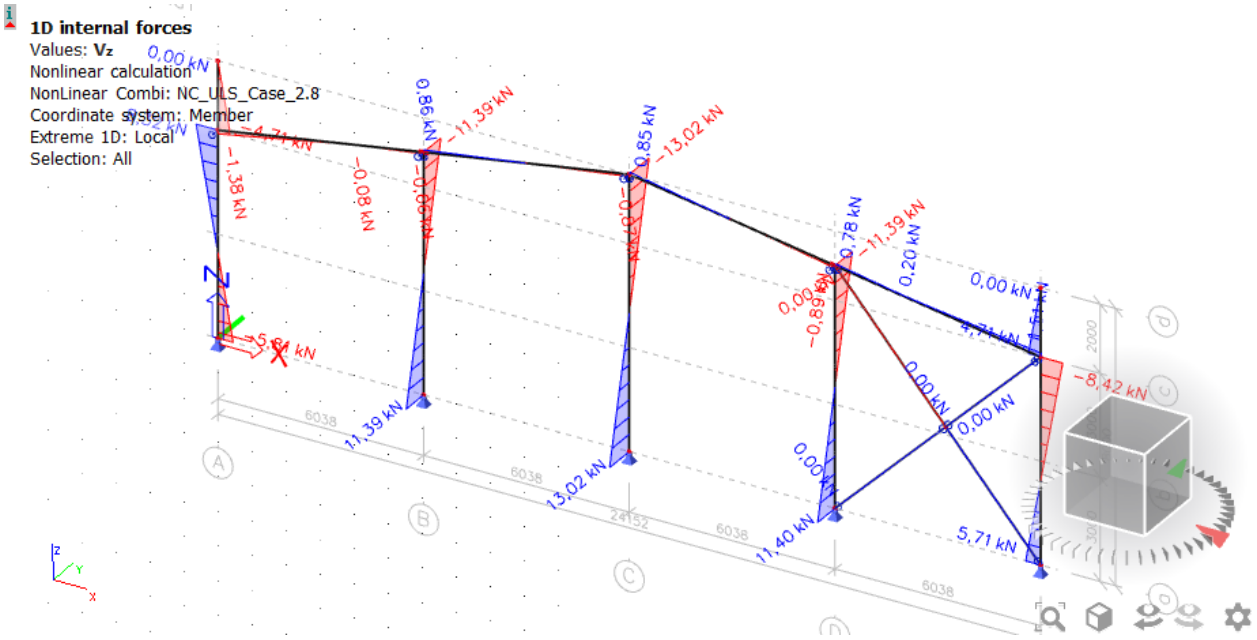

1D internal forces
Values: Mz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.9
Coordinate system: Member
Extreme 1D: Local
Selection: All
4,19 kNm
-0,04 kNm
0,01 kNm
-0,09 kNm
-5,52 kNm
-5,83 kNm
9,60 kNm
0,08 kNm
0,24 kNm
6038
24152

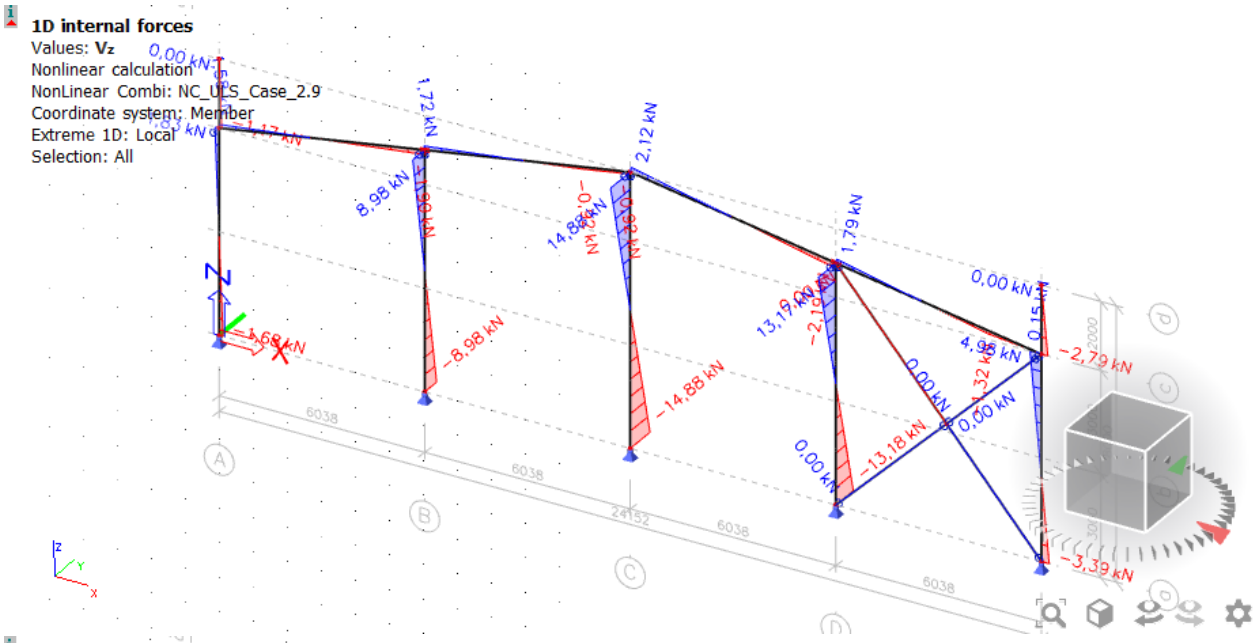
A axis - Shear forces

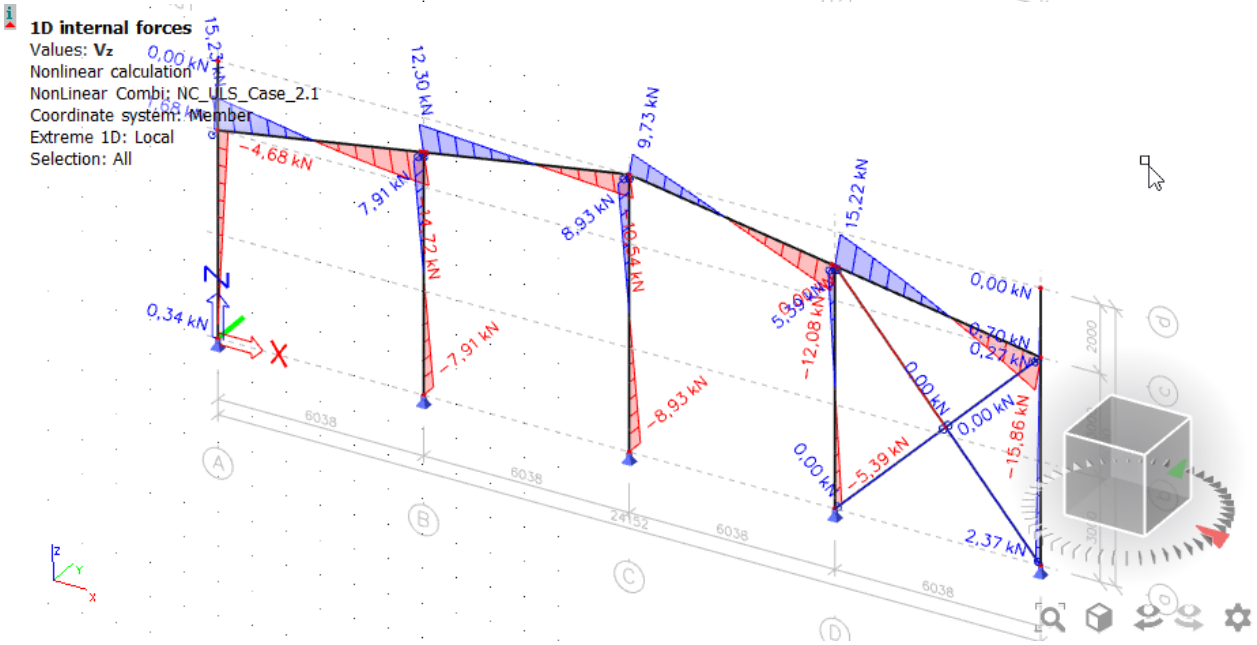


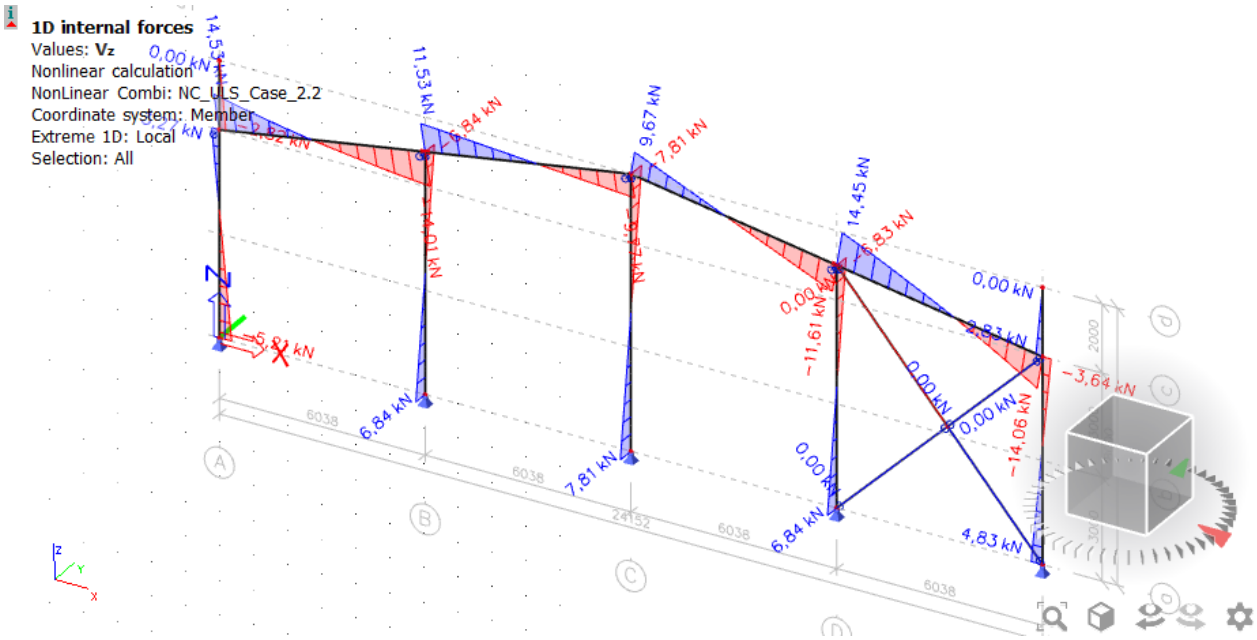


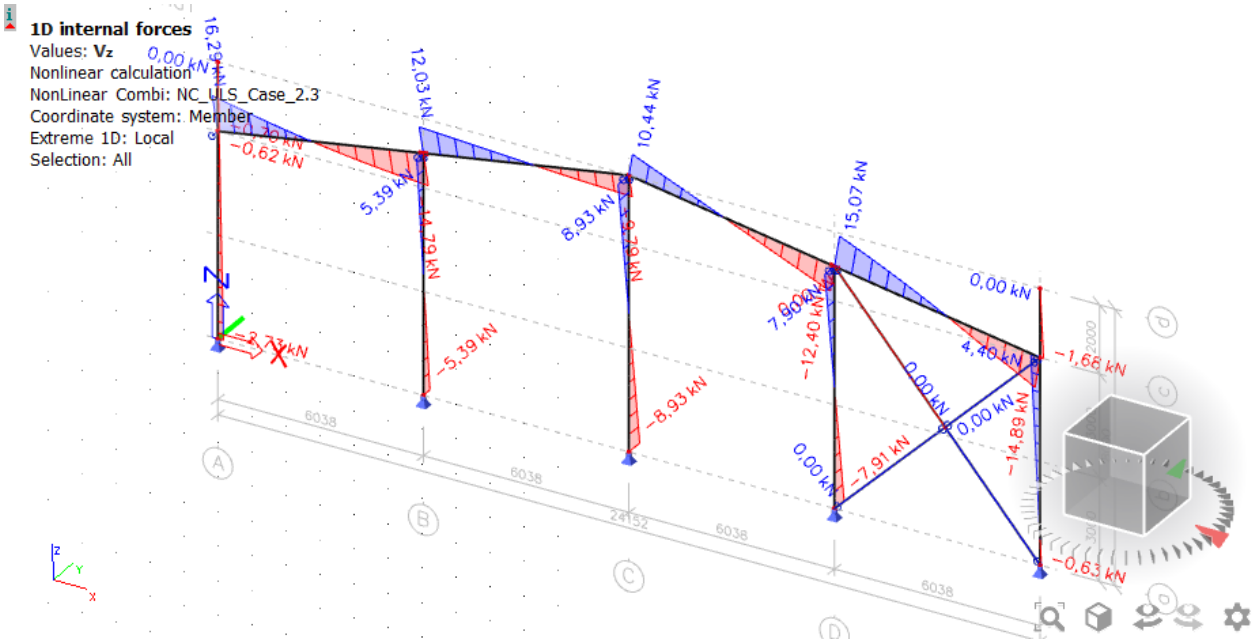

1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.7
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
2,15 kN
0,95 kN
0,96 kN
2,06 kN
0,00 kN
0,00 kN
1,17 kN
-1,90 kN
-1,51 kN
-4,92 kN
-0,21 kN
13,18 kN
14,88 kN
3,45 kN
-13,18 kN
-14,88 kN
8,98 kN
-8,98 kN
1,61 kN
6038
24152
2000

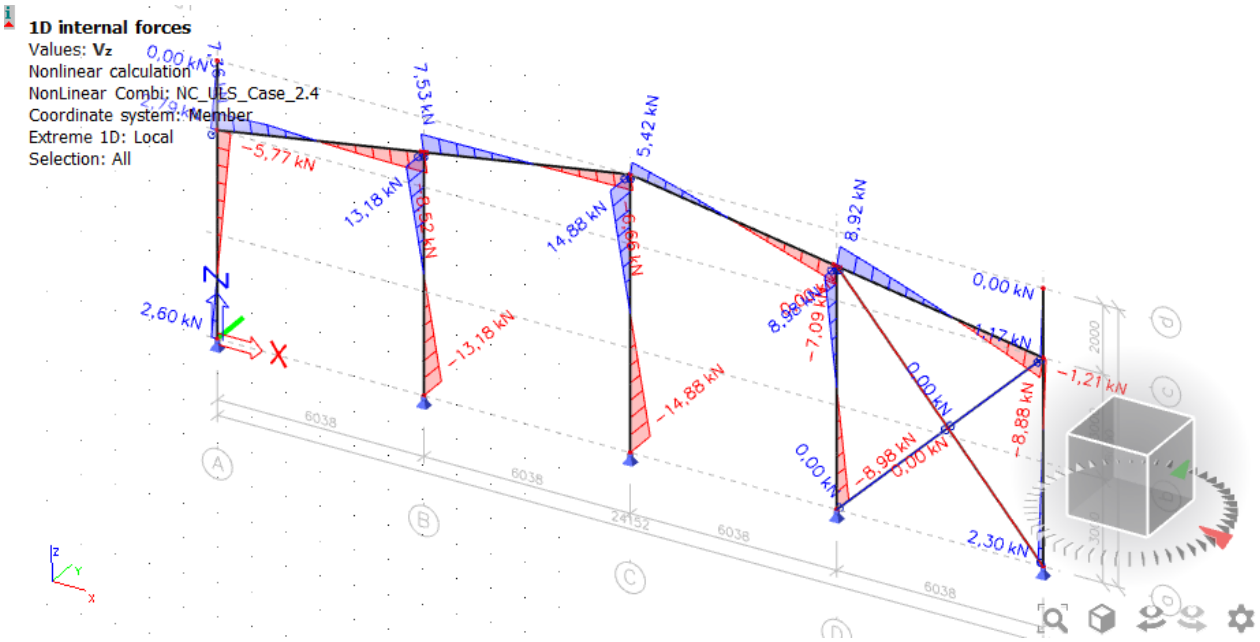

1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.8
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
0,86 kN
-11,39 kN
0,85 kN
-13,02 kN
0,78 kN
-11,39 kN
0,20 kN
0,00 kN
-8,42 kN
-4,71 kN
-1,38 kN
-0,08 kN
11,39 kN
13,02 kN
11,40 kN
5,71 kN
6038
24152
2000


1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.9
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
1,72 kN
2,12 kN
1,79 kN
8,98 kN
-8,98 kN
-14,88 kN
-13,18 kN
-3,39 kN
-2,79 kN
6038
24152

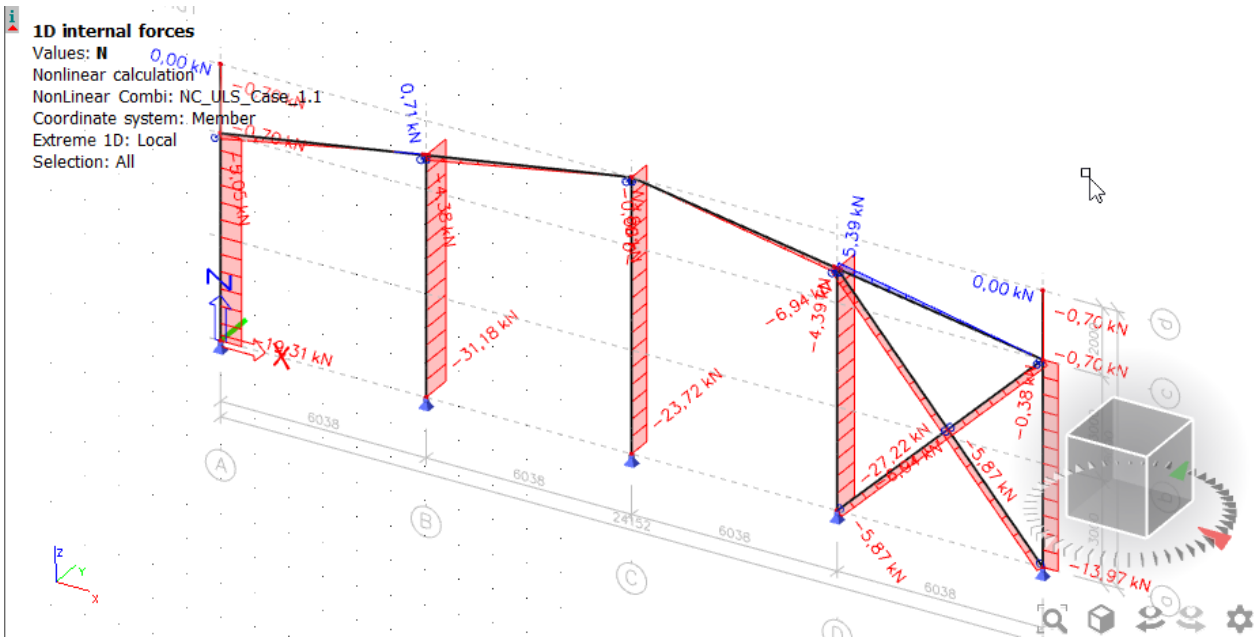

1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.1
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
12,30 kN
9,73 kN
15,22 kN
-4,68 kN
7,91 kN
-7,91 kN
-8,93 kN
-5,39 kN
-15,86 kN
2,37 kN
0,34 kN
6038
24152

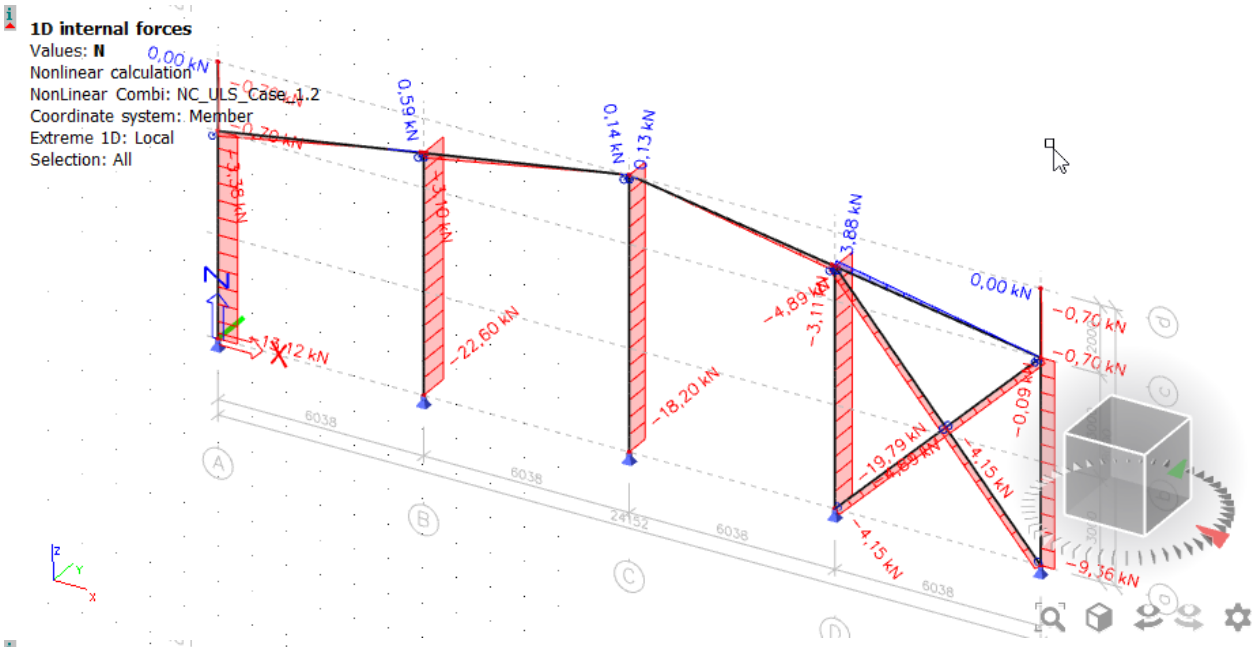

1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.2
Coordinate system: Member
Extreme 1D: Local
Selection: All
14,53 kN
0,00 kN
11,53 kN
9,67 kN
7,81 kN
14,45 kN
6,83 kN
0,00 kN
-11,61 kN
2,83 kN
-3,64 kN
0,00 kN
-14,06 kN
6,84 kN
7,81 kN
6,84 kN
4,83 kN
6038
24152
2000

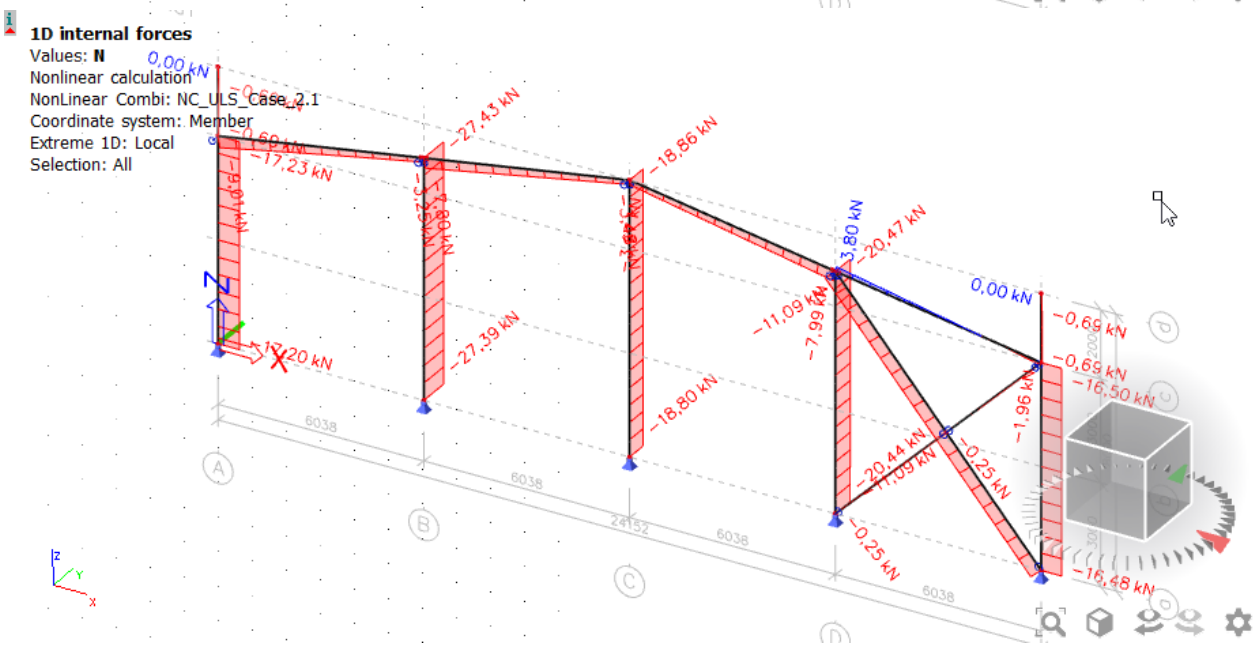

1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.3
Coordinate system: Member
Extreme 1D: Local
Selection: All
16,29 kN
0,00 kN
-0,62 kN
12,03 kN
5,39 kN
10,44 kN
8,93 kN
15,07 kN
0,00 kN
-12,40 kN
4,40 kN
-1,68 kN
0,00 kN
-14,89 kN
-5,39 kN
-8,93 kN
-7,91 kN
-0,63 kN
6038
24152
2000

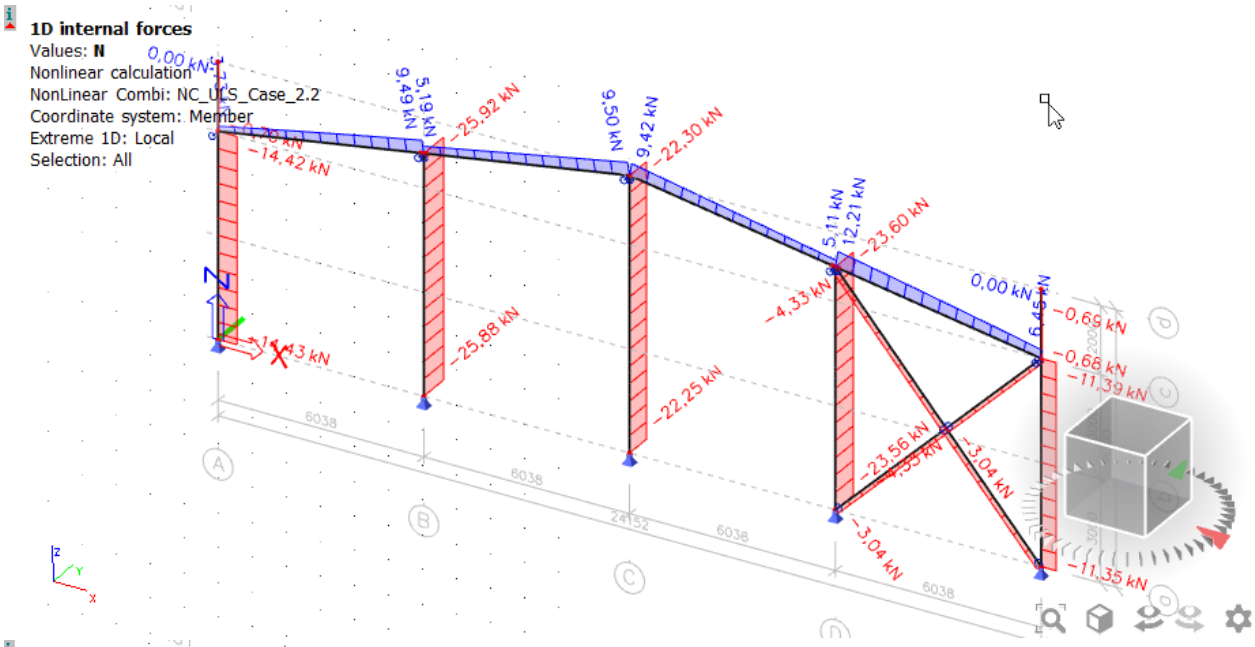


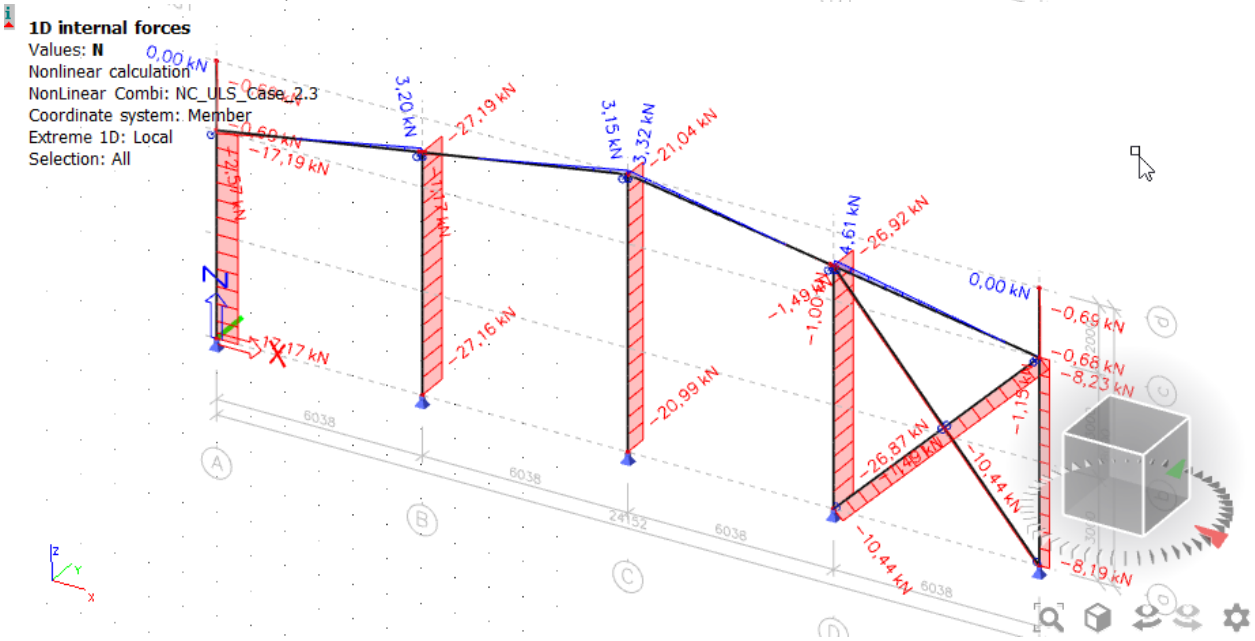
A axis - Normal forces along Y direction

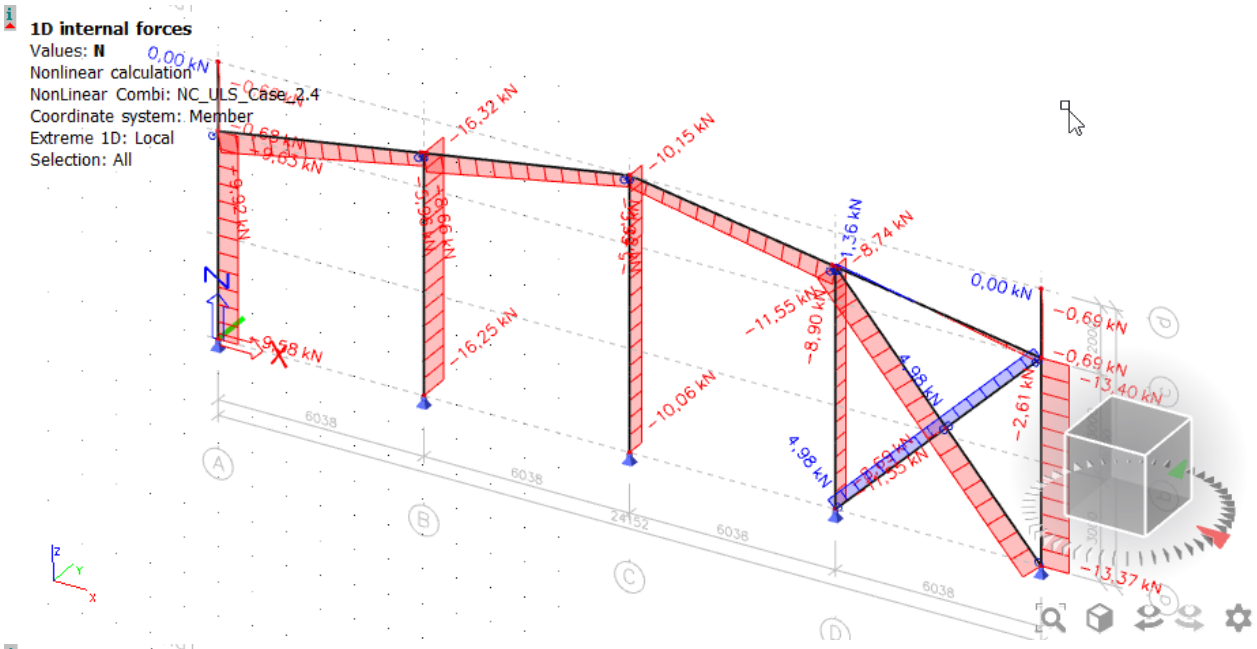


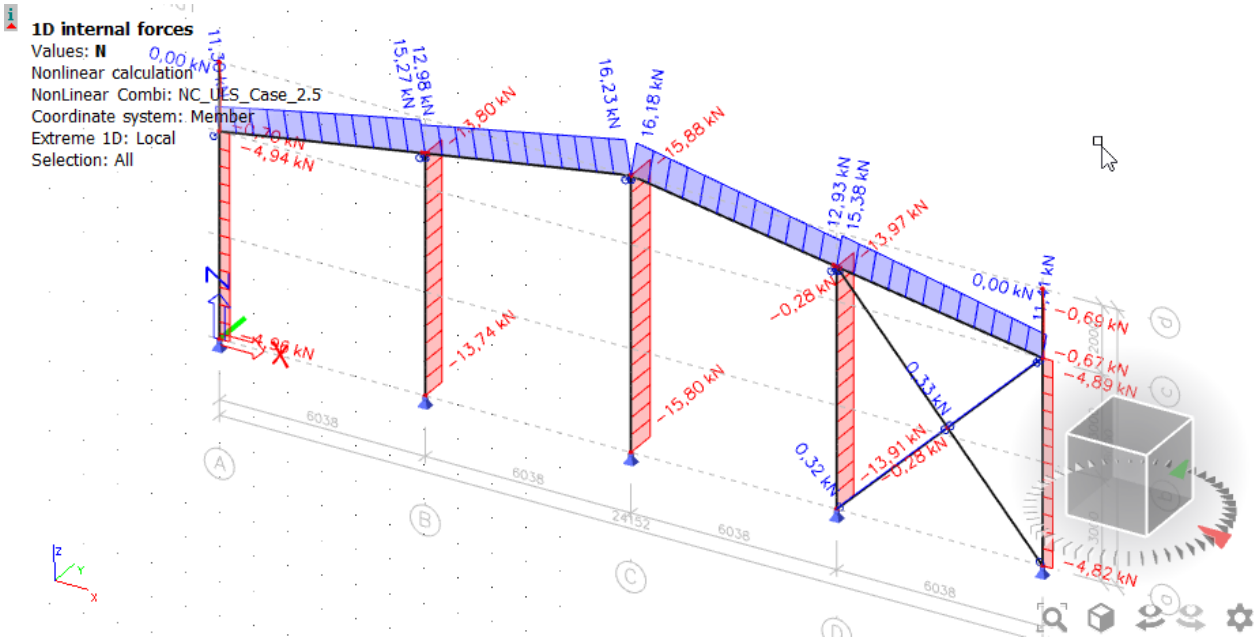

1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_1.2
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
0,59 kN
0,14 kN
0,13 kN
3,88 kN
0,00 kN
-0,70 kN
-0,70 kN
-0,69 kN
-4,89 kN
-3,11 kN
-22,60 kN
-18,20 kN
-19,79 kN
-4,15 kN
-4,15 kN
-9,36 kN
6038
24152
6038
6038

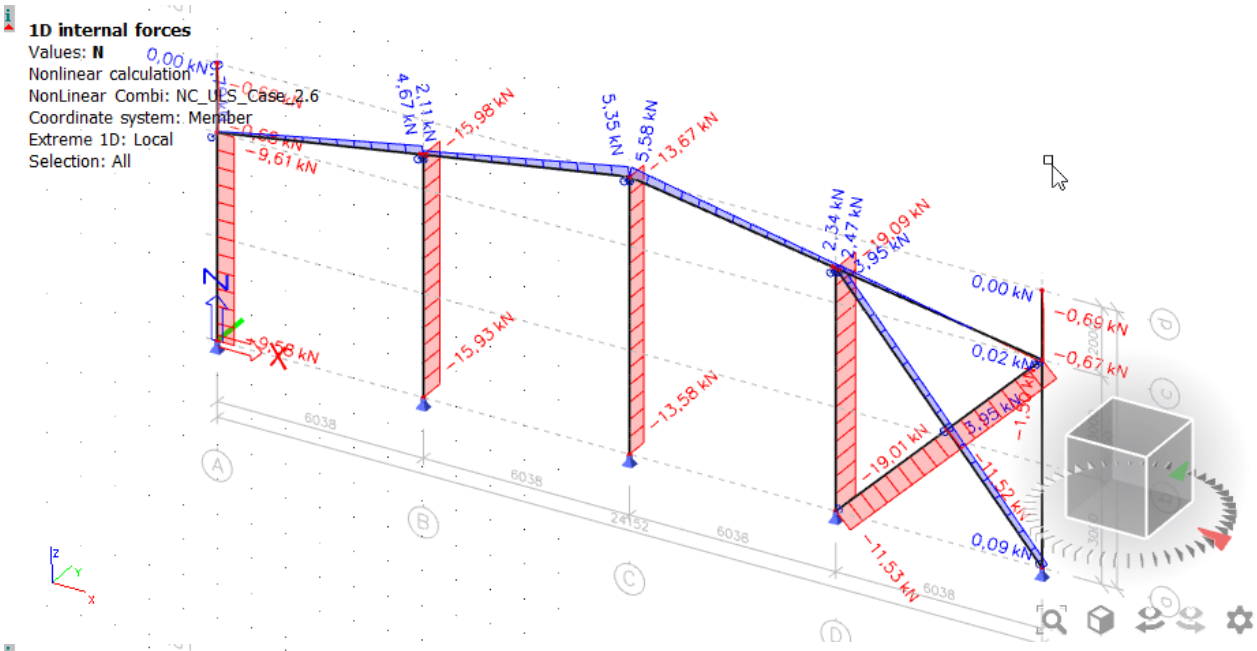

1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.1
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
-27,43 kN
-18,86 kN
-3,80 kN
-20,47 kN
0,00 kN
-0,69 kN
-0,69 kN
-16,50 kN
-11,09 kN
-7,99 kN
-1,96 kN
-27,39 kN
-18,80 kN
-20,44 kN
-11,09 kN
-0,25 kN
-0,25 kN
-16,48 kN
6038
24152
6038
6038

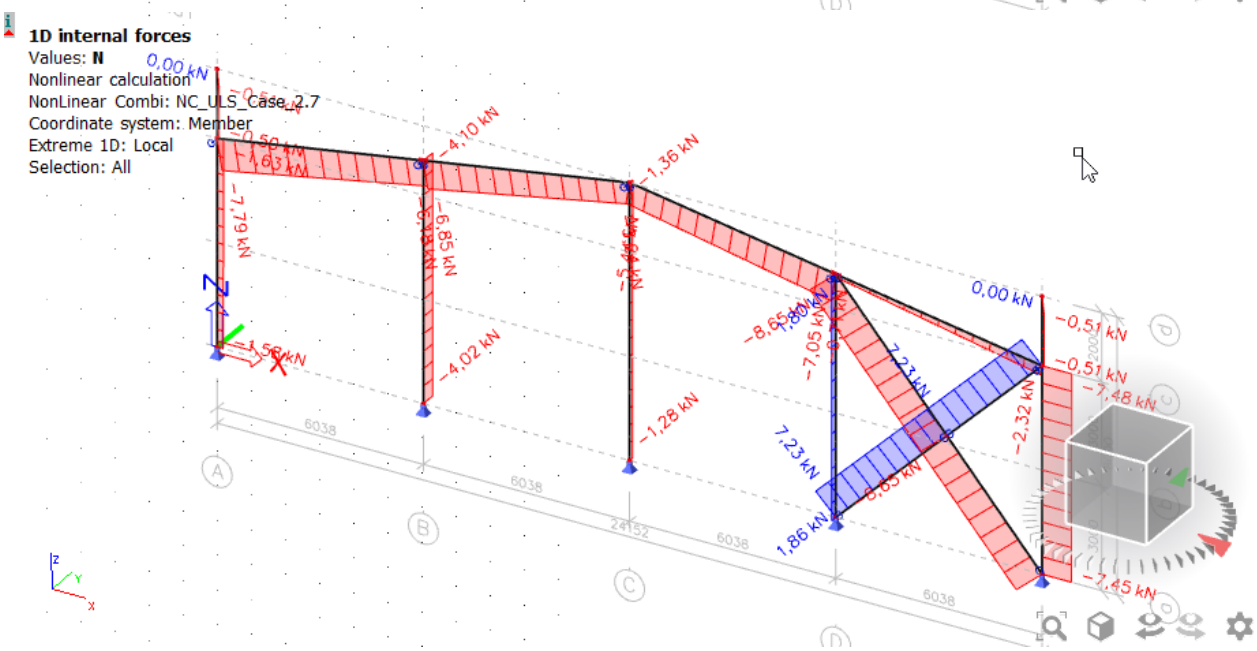

1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.2
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
9,49 kN
5,19 kN
-25,92 kN
9,50 kN
9,42 kN
-22,30 kN
5,11 kN
12,21 kN
-23,60 kN
0,00 kN
-14,42 kN
-25,88 kN
-22,25 kN
-4,33 kN
-0,69 kN
-0,68 kN
-11,39 kN
-23,56 kN
-3,04 kN
-3,04 kN
-11,35 kN
6038
24152
A
B
C
D

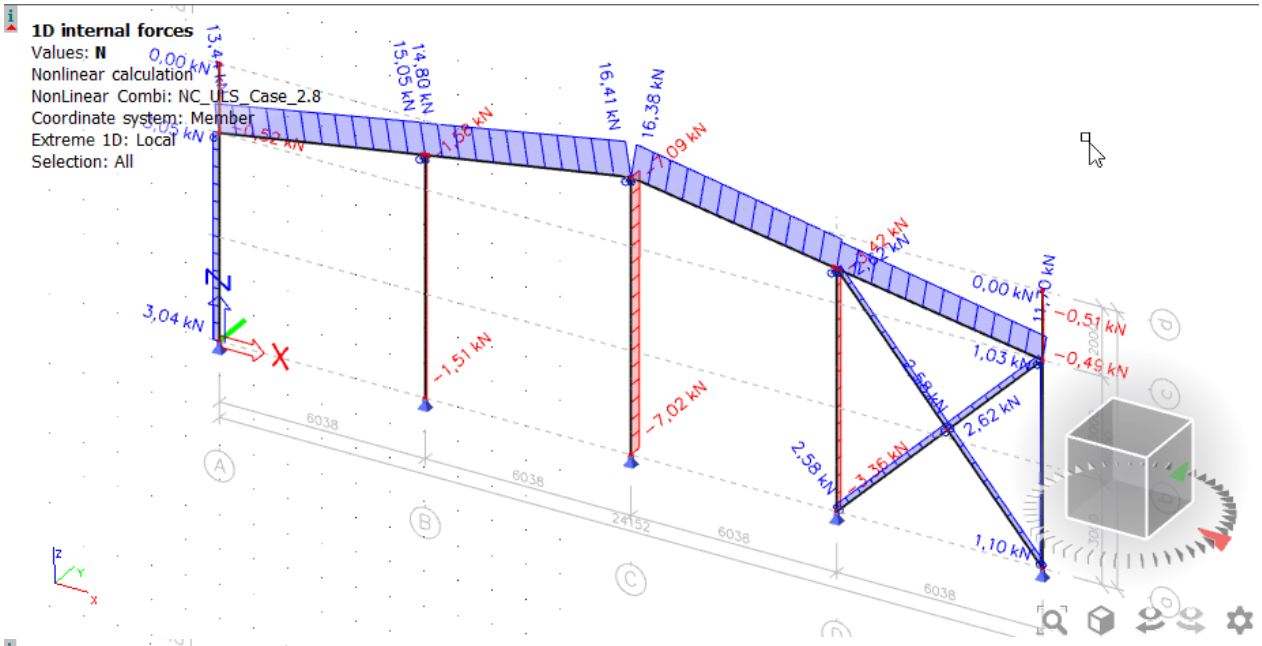

1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.3
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
3,20 kN
-27,19 kN
3,15 kN
3,32 kN
-21,04 kN
4,61 kN
-26,92 kN
-17,19 kN
-27,16 kN
-20,99 kN
-1,49 kN
-1,00 kN
0,00 kN
-0,69 kN
-0,68 kN
-8,23 kN
-26,87 kN
-10,44 kN
-10,44 kN
-8,19 kN
6038
24152
A
B
C
D

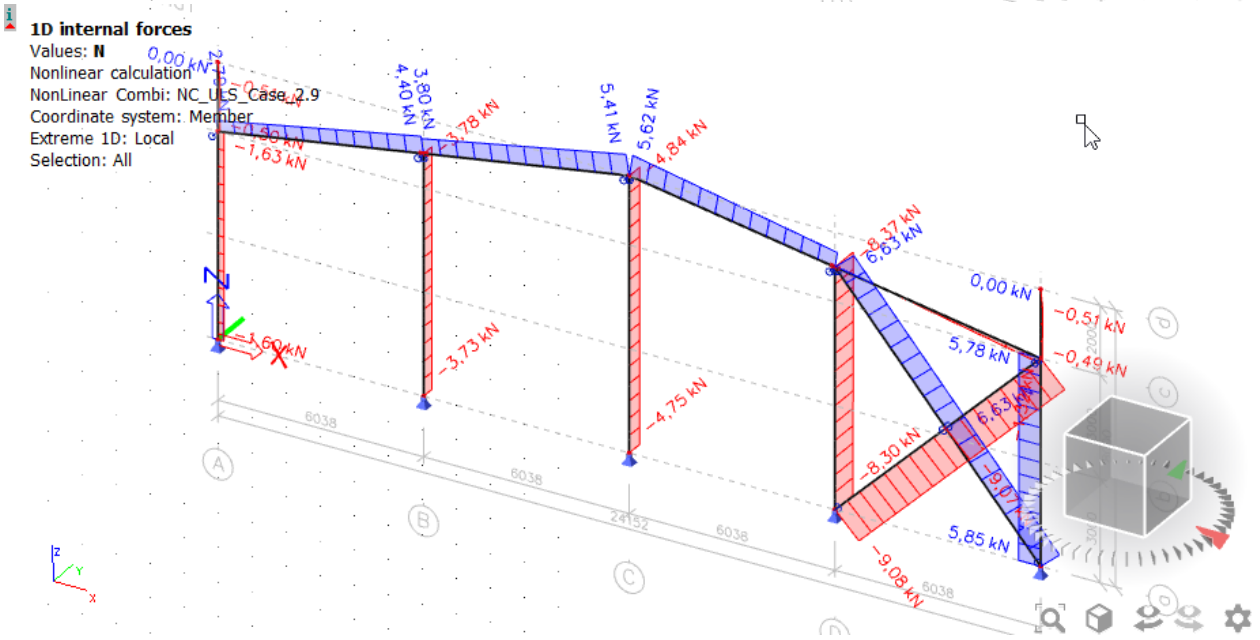

1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.4
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
-16,32 kN
-10,15 kN
-16,25 kN
-10,06 kN
-11,55 kN
-8,90 kN
-8,74 kN
4,98 kN
-2,61 kN
-0,69 kN
-13,40 kN
-13,37 kN
6038
24152


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.5
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
15,27 kN
12,98 kN
16,23 kN
16,18 kN
15,88 kN
12,93 kN
15,38 kN
13,97 kN
-4,94 kN
-13,74 kN
-15,80 kN
-0,28 kN
0,33 kN
0,32 kN
-13,91 kN
-0,69 kN
-0,67 kN
-4,89 kN
-4,82 kN
6038
24152


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.6
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
-9,61 kN
4,67 kN
2,11 kN
-15,98 kN
5,35 kN
5,58 kN
-13,67 kN
2,34 kN
2,47 kN
3,95 kN
-19,09 kN
-15,93 kN
-13,58 kN
-19,01 kN
-11,53 kN
0,00 kN
-0,69 kN
0,02 kN
-0,67 kN
0,09 kN
6038
24152


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.7
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
-4,10 kN
-1,36 kN
-7,79 kN
-6,85 kN
-4,02 kN
-1,28 kN
-7,05 kN
7,23 kN
1,86 kN
0,00 kN
-0,51 kN
-0,51 kN
-7,48 kN
-2,32 kN
-7,45 kN
6038
24152


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.8
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
13,41 kN
14,80 kN
15,05 kN
16,41 kN
16,38 kN
3,04 kN
-1,51 kN
-7,02 kN
2,58 kN
2,62 kN
1,03 kN
0,00 kN
-0,51 kN
-0,49 kN
1,10 kN
6038
24152


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_Case_2.9
Coordinate system: Member
Extreme 1D: Local
Selection: All
0,00 kN
3,80 kN
4,40 kN
5,41 kN
5,62 kN
-1,63 kN
-3,73 kN
-4,75 kN
-8,37 kN
6,63 kN
0,00 kN
5,78 kN
-8,30 kN
5,85 kN
-9,08 kN
-0,51 kN
-0,49 kN
6038
24152

APPENDIX B

Load combinations, deformations, internal forces on B axis

B1. Loads

This part contains the imposed loads on the B axis

B2. Load combinations

This part contains the load combination inputs to Scia Engineer software

B3. Deformations

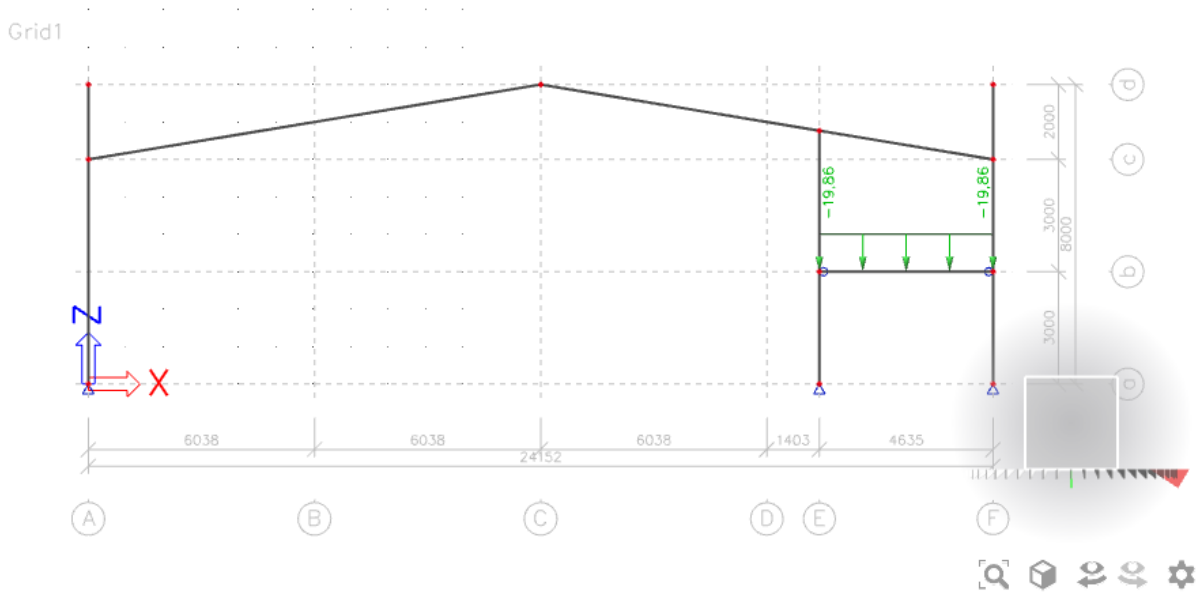
This part contains the deformation output from Scia Engineer software

B4. Internal forces

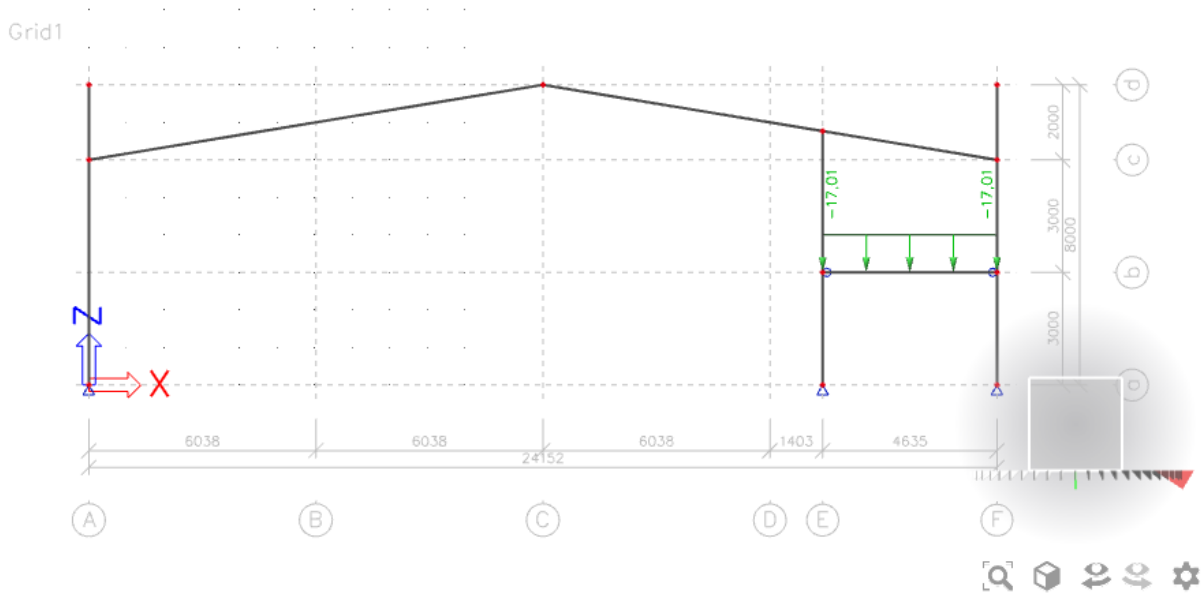
This part contains the internal forces output from Scia Engineer software

B Axis Loads

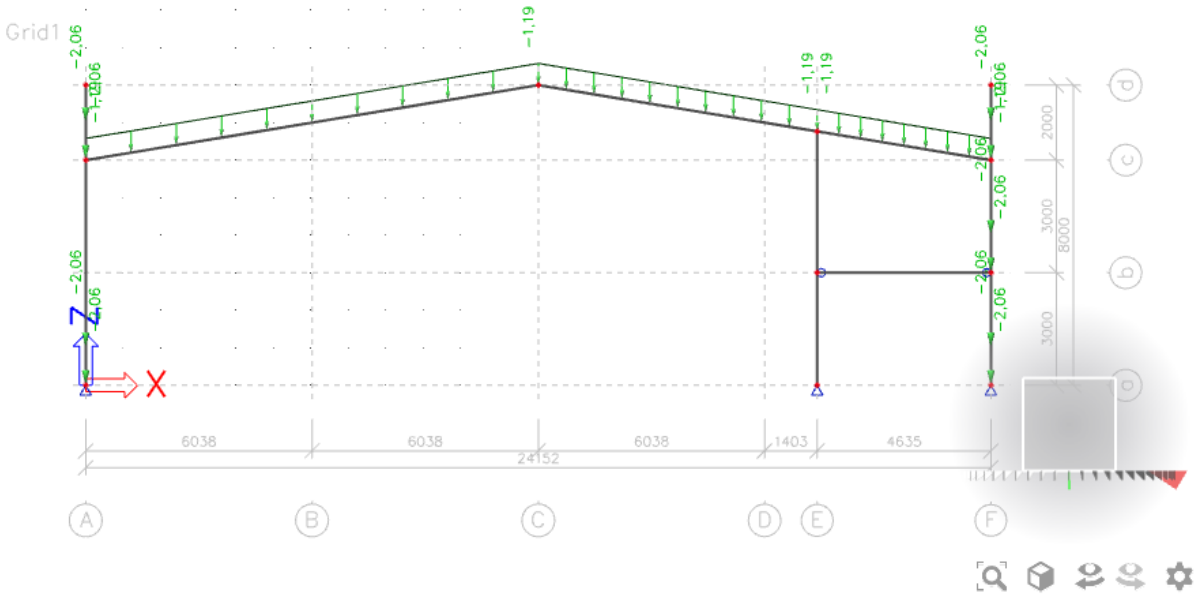
B Axis – Dead Load



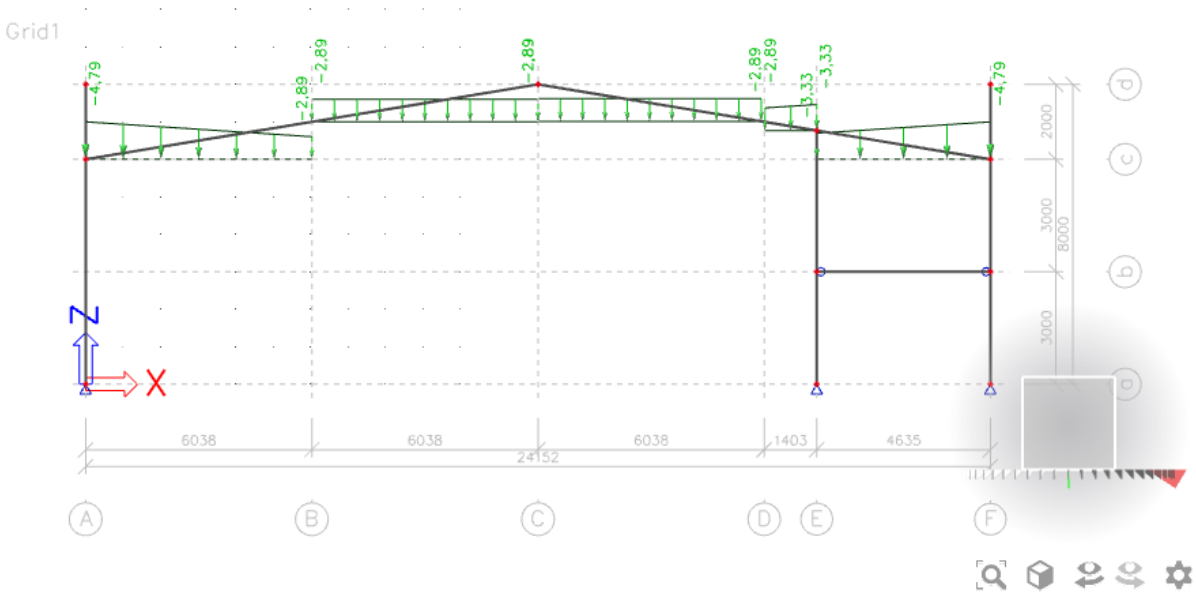
B Axis – Live Load



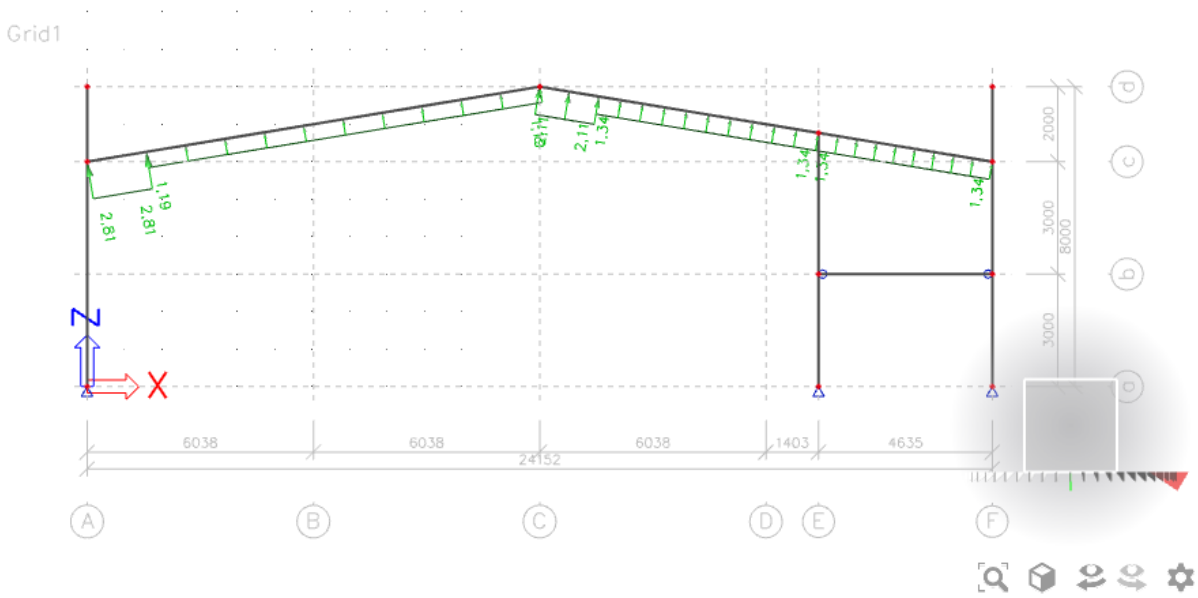
B Axis – Roof Load



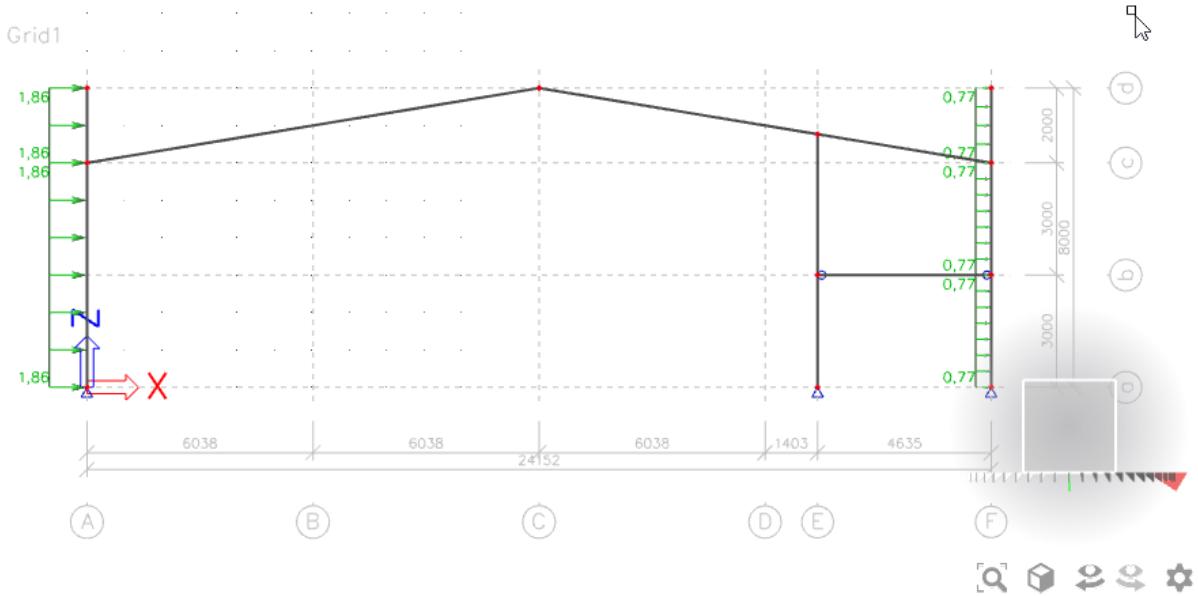
B Axis – Snow Load



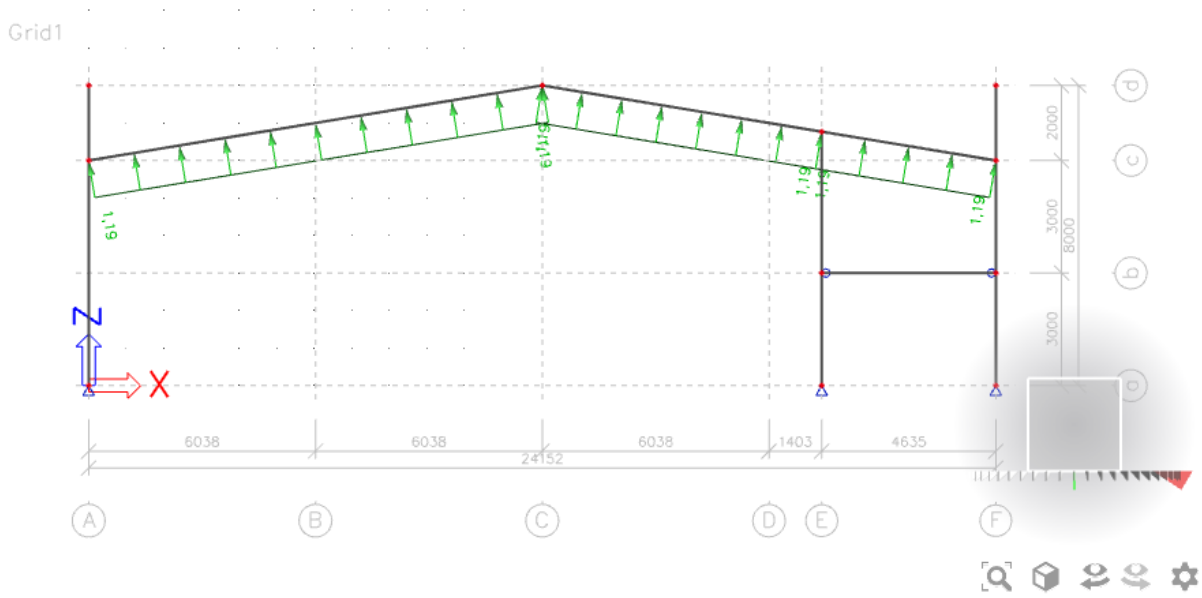
A Axis – Wind Load 1 - Roof



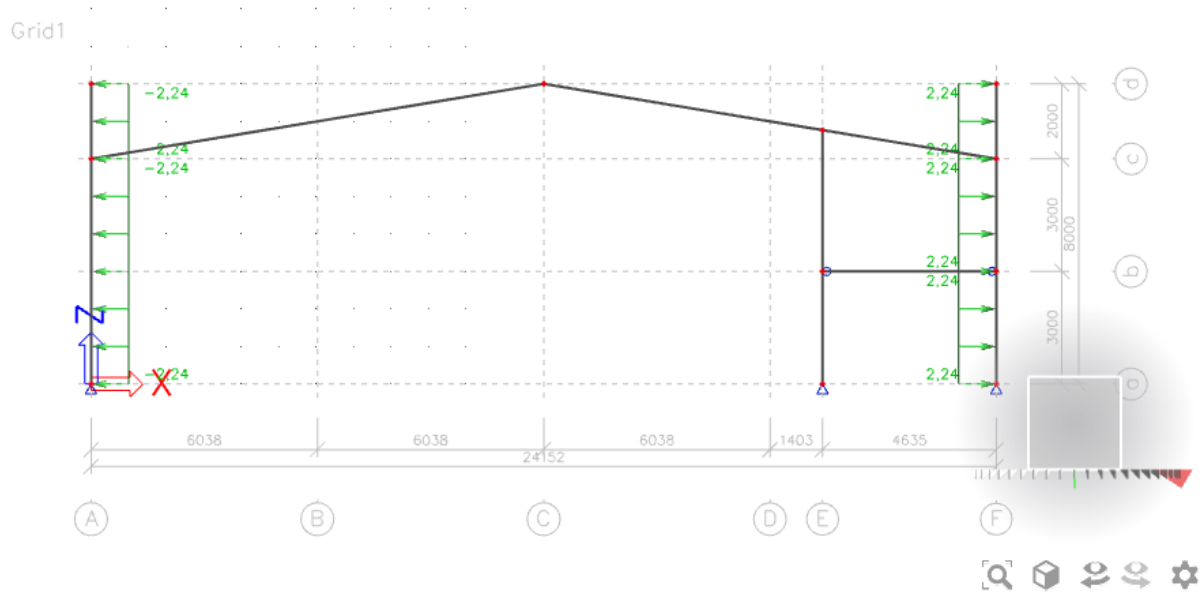
A Axis – Wind Load 1 - Walls



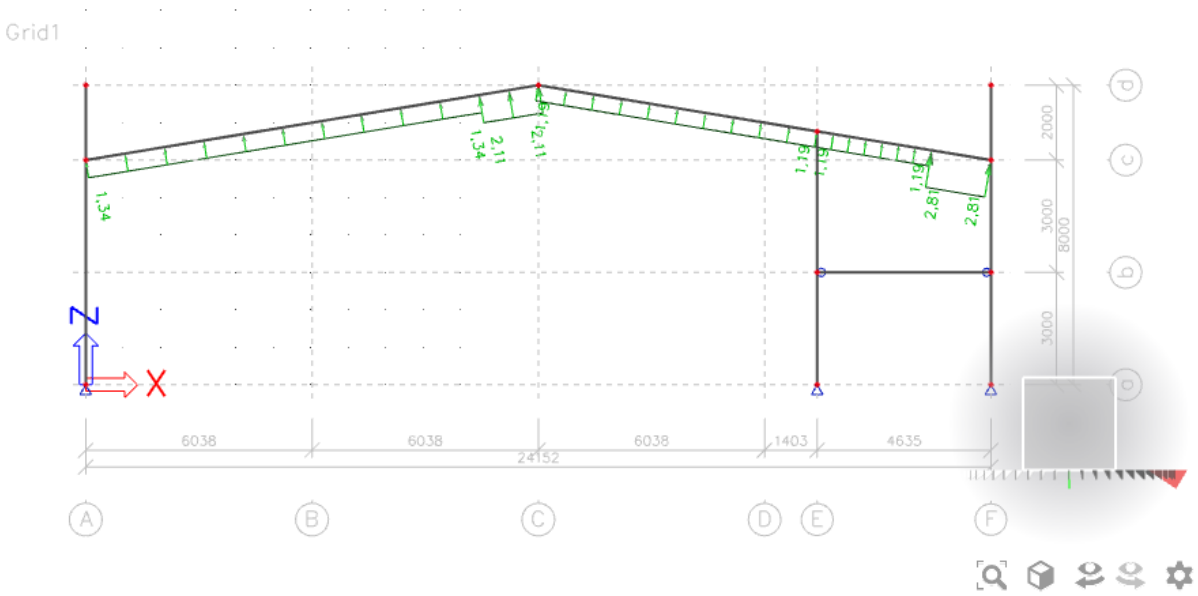
A Axis – Wind Load 2 - Roof



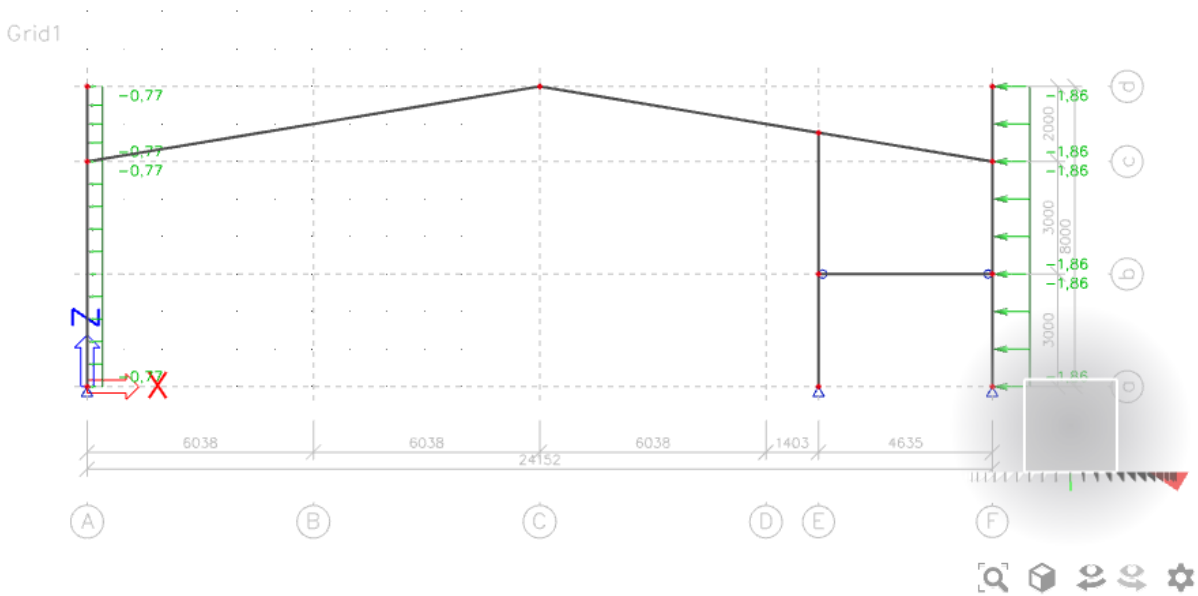
A Axis – Wind Load 2 - Walls



A Axis – Wind Load 3 - Roof



A Axis – Wind Load 3 - Walls



B Axis - SLS Cases

Name	SLS_1.1
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
RL - roof load [-]	1,00
LL - live load [-]	0,70
SL - snow load [-]	1,00

Name	SLS_1.2
Description	
Type	EN-SLS Characteristic
Structure	Building
Active coefficients	☑
Contents of combination	
RL - roof load [-]	1,00
LL - live load [-]	1,00
SL - snow load [-]	0,50

Name	SLS_2.1
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	0,60
WLR1 - wind load roof 1 [-]	0,60
LL - live load [-]	0,70
DL - dead load [-]	1,00
SL - snow load [-]	1,00

Name	SLS_2.2
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	0,60
WLR2 - wind load roof 2 [-]	0,60
LL - live load [-]	0,70
DL - dead load [-]	1,00
SL - snow load [-]	1,00

Name	SLS_2.3
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
LL - live load [-]	0,70
DL - dead load [-]	1,00
SL - snow load [-]	1,00
WLW3 - wind load walls 3 [-]	0,60
WLR3 - wind load roof 3 [-]	0,60

Name	SLS_2.4
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	1,00
WLR1 - wind load roof 1 [-]	1,00
LL - live load [-]	0,70
DL - dead load [-]	1,00
SL - snow load [-]	0,50

Name	SLS_2.5
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	1,00

Name	SLS_2.6
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
LL - live load [-]	0,70
DL - dead load [-]	1,00

Name	SLS_2.7
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	1,00
WLR1 - wind load roof 1 [-]	1,00
DL - dead load [-]	1,00

Name	SLS_2.8
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	1,00
WLR2 - wind load roof 2 [-]	1,00
DL - dead load [-]	1,00

Name	SLS_2.9
Description	
Type	Linear - serviceability
Contents of combination	
RL - roof load [-]	1,00
DL - dead load [-]	1,00
WLW3 - wind load walls 3 [-]	1,00
WLR3 - wind load roof 3 [-]	1,00

B Axis - ULS Cases

Name	NC_ULS_1.1
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
LL - live load [-]	1,05
SL - snow load [-]	1,50
Bow imperfection	None
Global imperfection	None

Name	NC_ULS_1.2
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
LL - live load [-]	1,50
SL - snow load [-]	0,75
Bow imperfection	None
Global imperfection	None

Name	NC_ULS_2.1
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
WLW1 - wind load walls 1 [-]	0,90
WLR1 - wind load roof 1 [-]	0,90
LL - live load [-]	1,05
DL - dead load [-]	1,35
SL - snow load [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9

Name	NC_ULS_2.2
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
WLW2 - wind load walls 2 [-]	0,90
WLR2 - wind load roof 2 [-]	0,90
LL - live load [-]	1,05
DL - dead load [-]	1,35
SL - snow load [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9

Name	NC_ULS_2.3
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
LL - live load [-]	1,05
DL - dead load [-]	1,35
SL - snow load [-]	1,50
WLW3 - wind load walls 3 [-]	0,90
WLR3 - wind load roof 3 [-]	0,90
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	-2,9

Name	NC_ULS_2.4
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
WLW1 - wind load walls 1 [-]	1,50
WLR1 - wind load roof 1 [-]	1,50
LL - live load [-]	1,05
DL - dead load [-]	1,35
SL - snow load [-]	0,75
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9

Name	NC_ULS_2.5
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
WLW2 - wind load walls 2 [-]	1,50
WLR2 - wind load roof 2 [-]	1,50
LL - live load [-]	1,05
DL - dead load [-]	1,35
SL - snow load [-]	0,75
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9

Name	NC_ULS_2.6
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,35
LL - live load [-]	1,05
DL - dead load [-]	1,35
SL - snow load [-]	0,75
WLW3 - wind load walls 3 [-]	1,50
WLR3 - wind load roof 3 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	-2,9

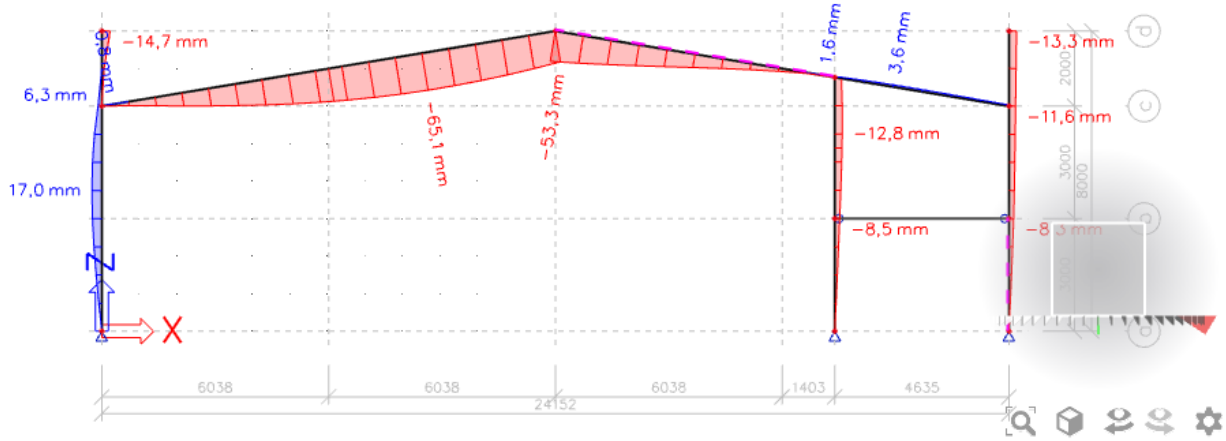
Name	NC_ULS_2.7
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,00
WLW1 - wind load walls 1 [-]	1,50
WLR1 - wind load roof 1 [-]	1,50
DL - dead load [-]	1,00
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9

Name	NC_ULS_2.8
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,00
WLW2 - wind load walls 2 [-]	1,50
WLR2 - wind load roof 2 [-]	1,50
DL - dead load [-]	1,00
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	2,9

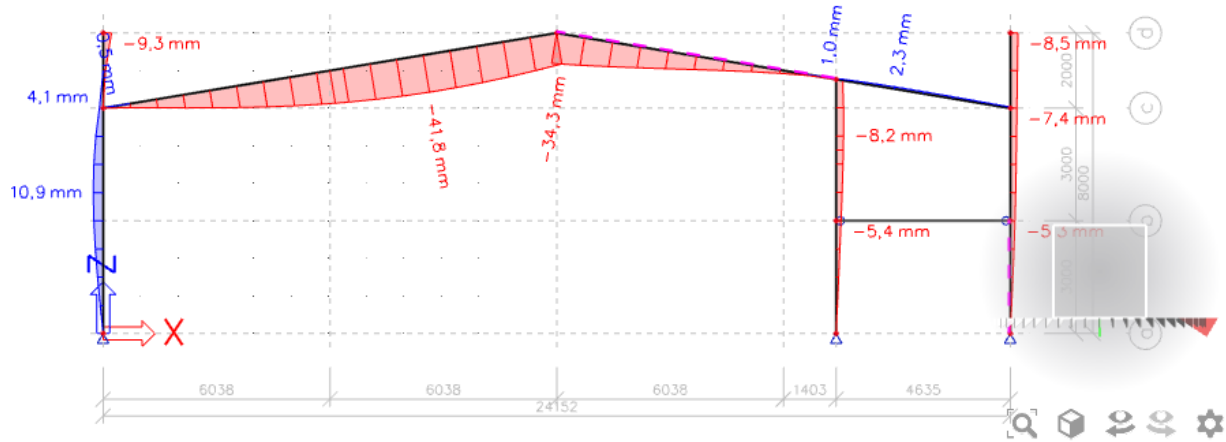
Name	NC_ULS_2.9
Description	
Type	Ultimate
Contents of combination	
RL - roof load [-]	1,00
DL - dead load [-]	1,00
WLW3 - wind load walls 3 [-]	1,50
WLR3 - wind load roof 3 [-]	1,50
Bow imperfection	None
Global imperfection	Simple inclination
dx [mm/m]	-2,9

B axis - Deformations

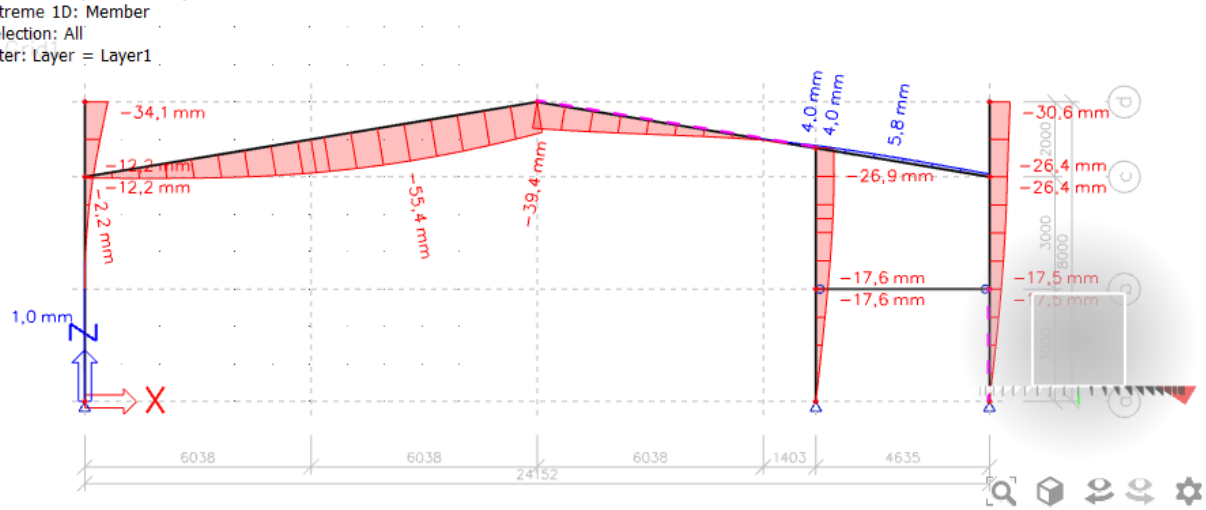
1D deformations
Values: uz
Linear calculation
Combination: SLS_1.1
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



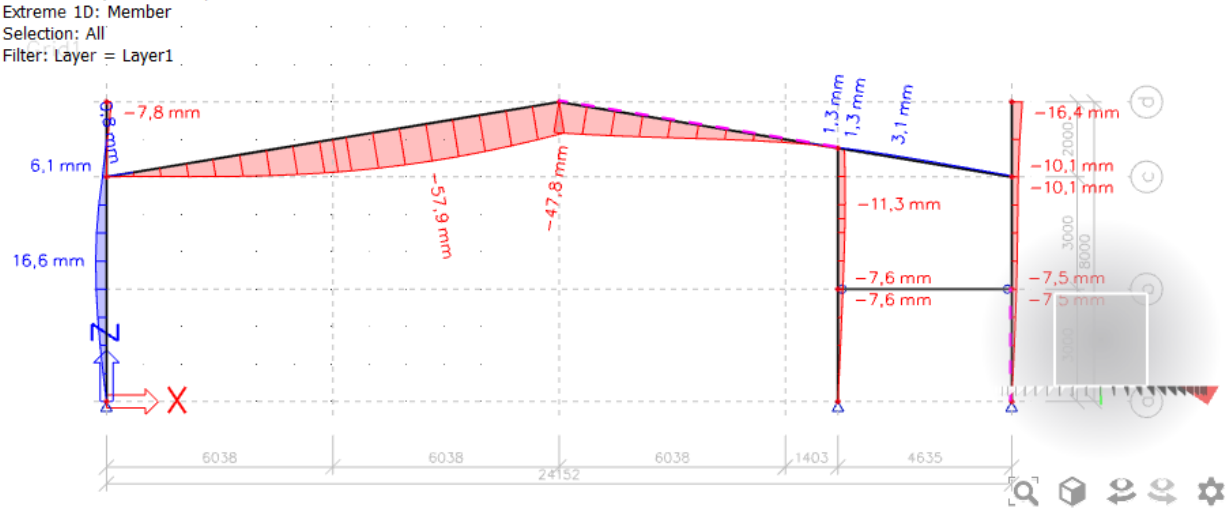
1D deformations
Values: uz
Linear calculation
Combination: SLS_1.2
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



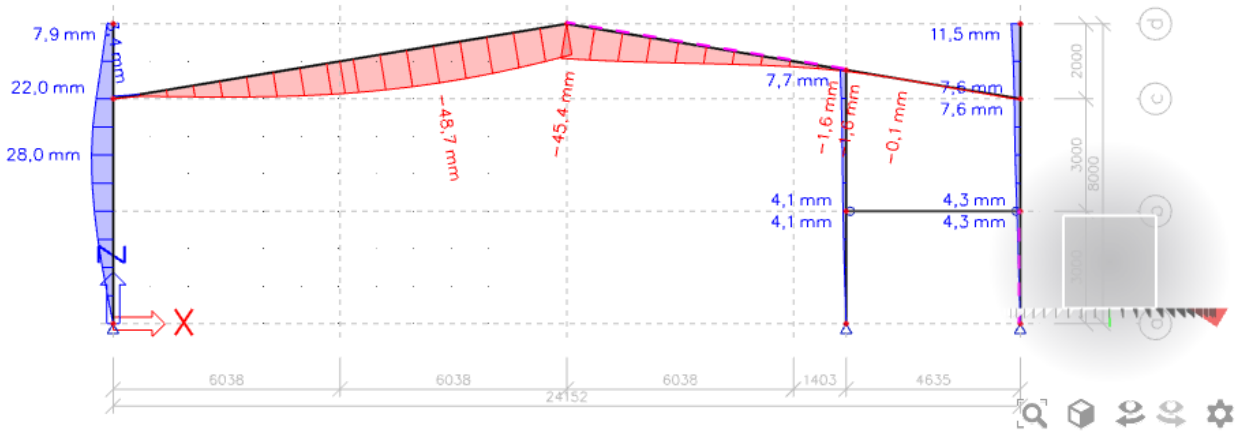
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.1
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



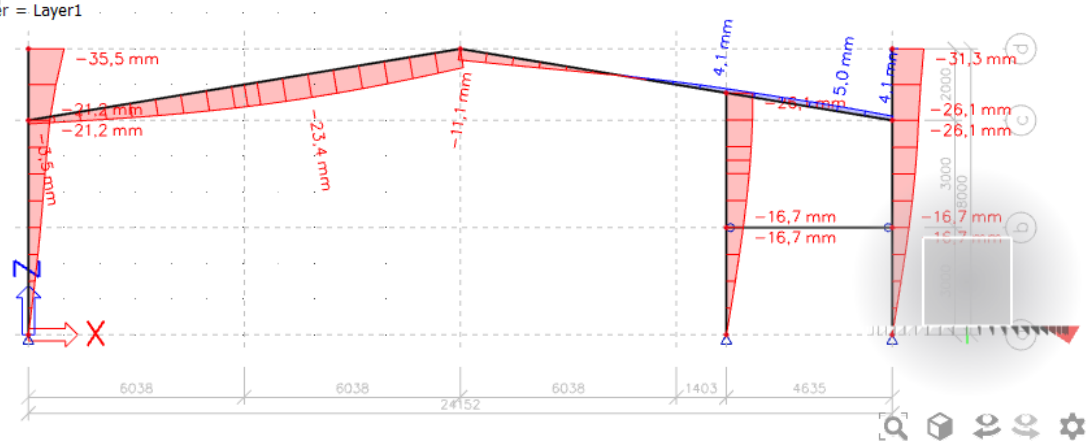
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.2
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



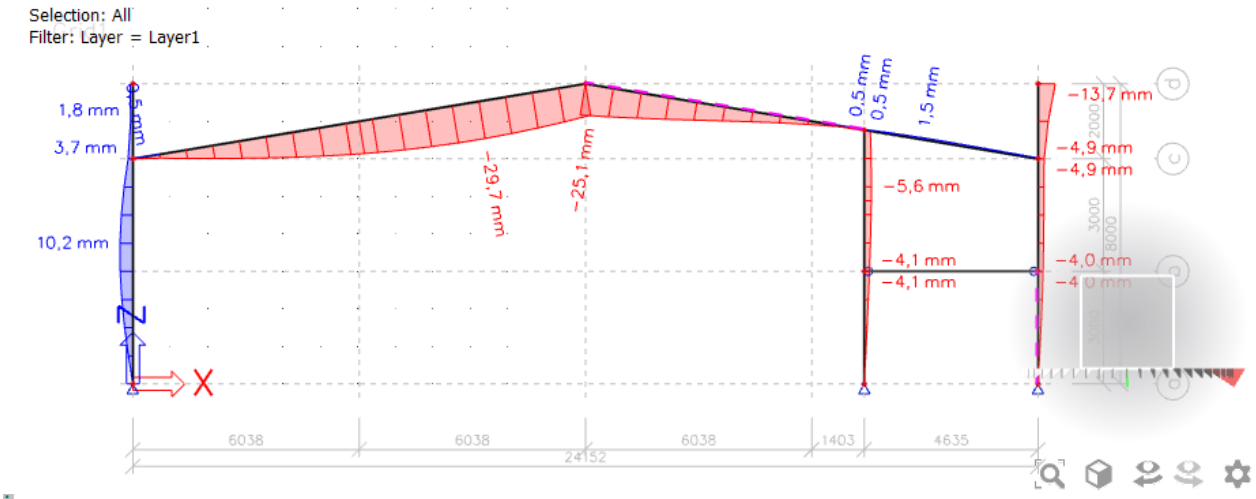
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.3
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



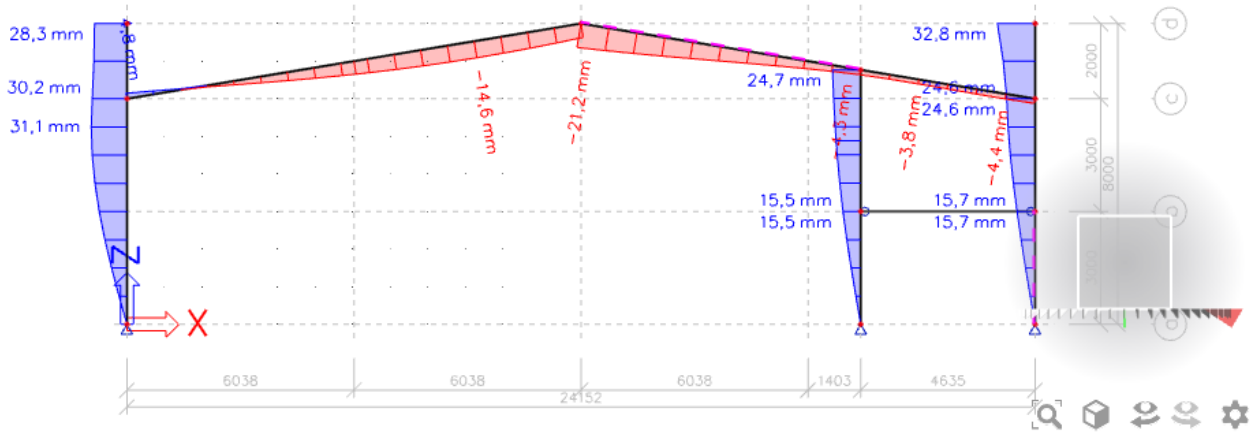
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.4
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



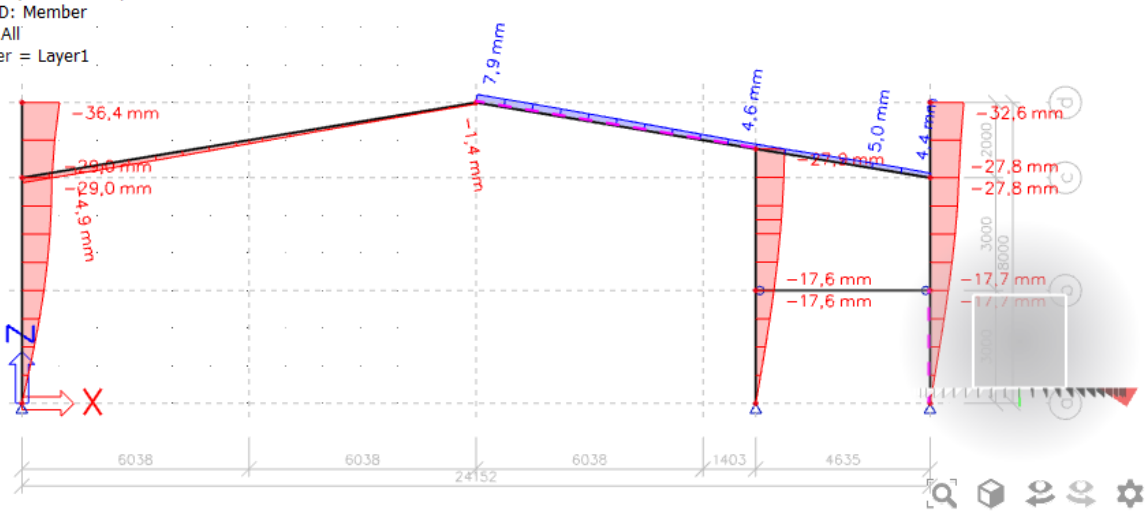
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.5
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



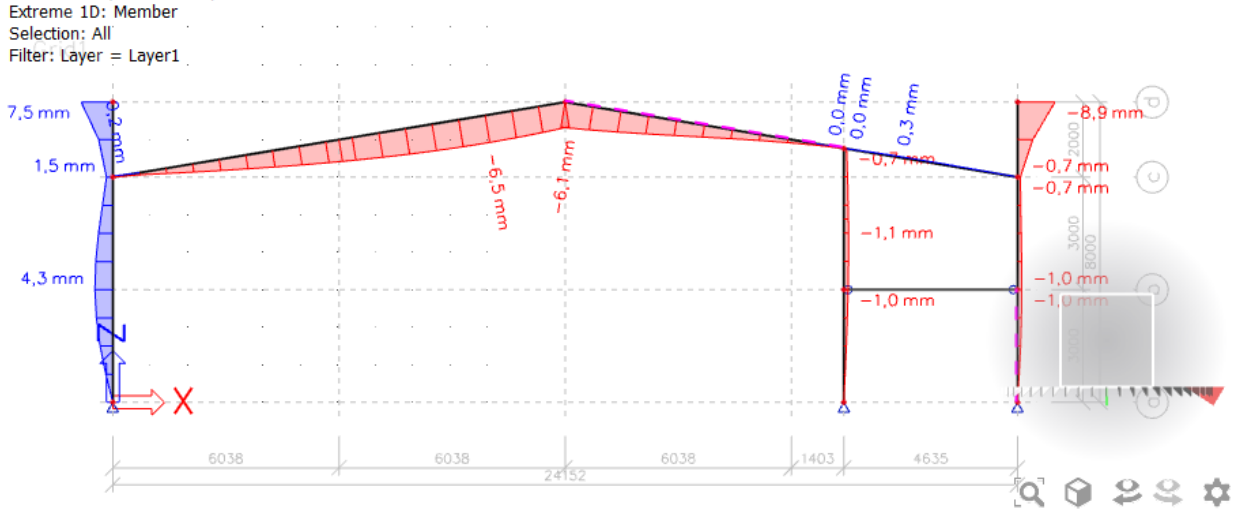
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.6
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



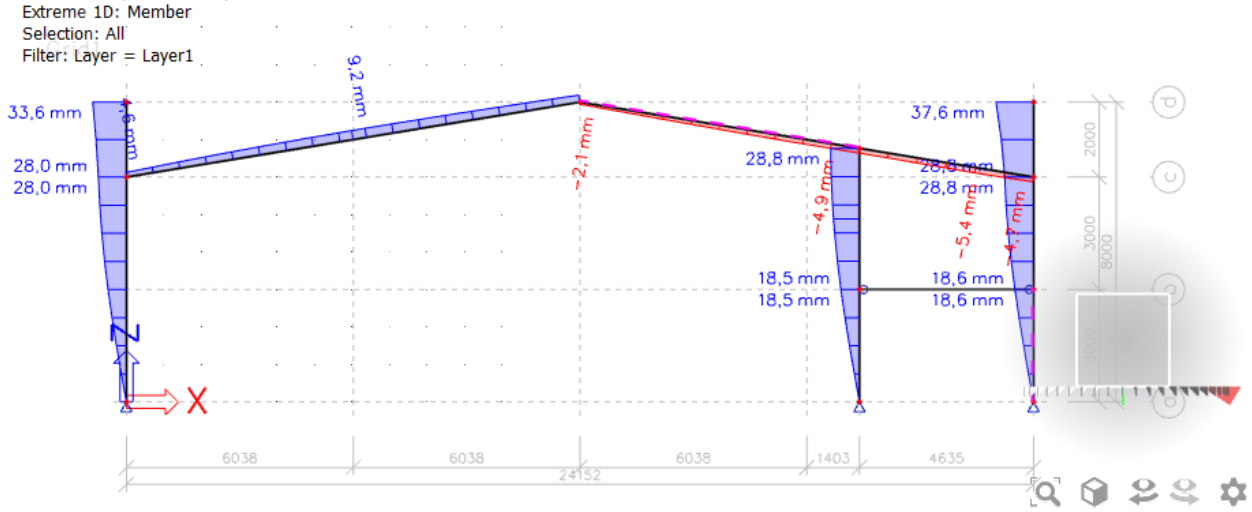
1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.7
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



1D deformations
Values: u_z
Linear calculation
Combination: SLS_2.8
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1

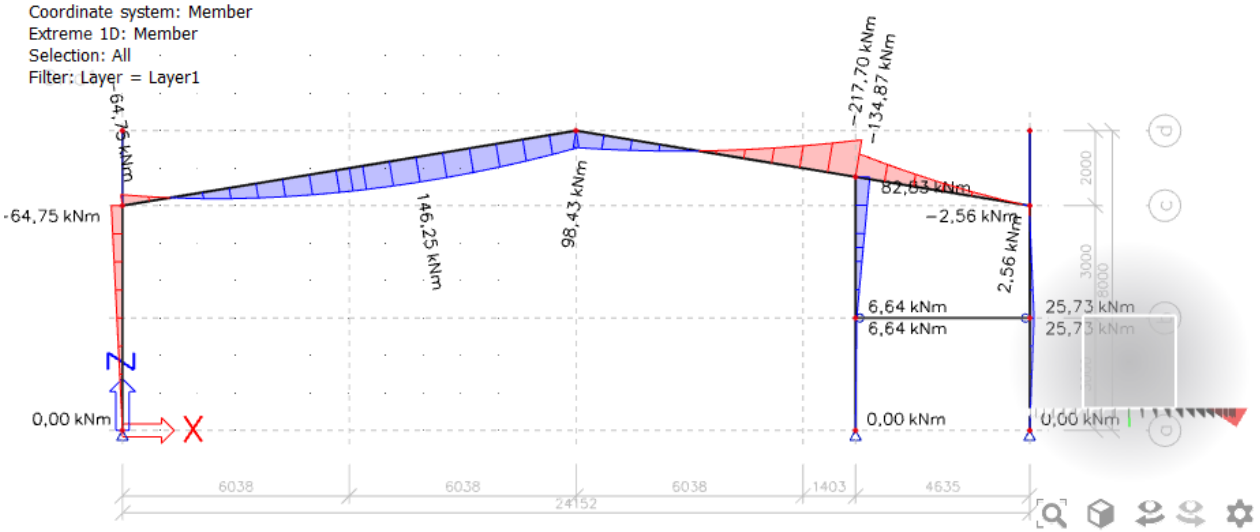


1D deformations
Values: uz
Linear calculation
Combination: SLS_2.9
Coordinate system: Principal
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1

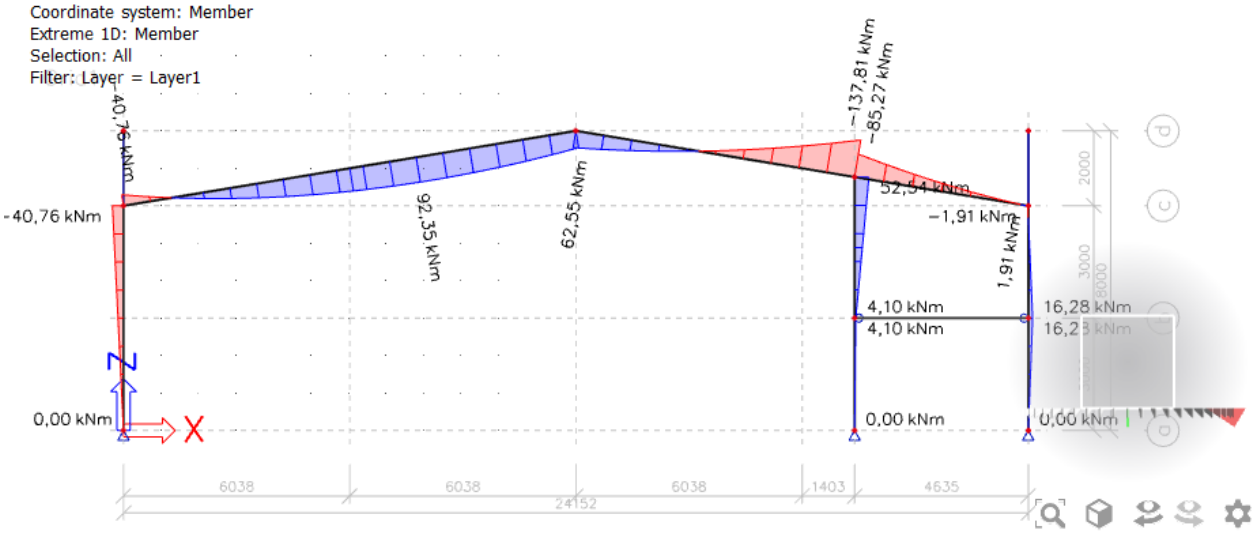


B Axis – Moment resistances

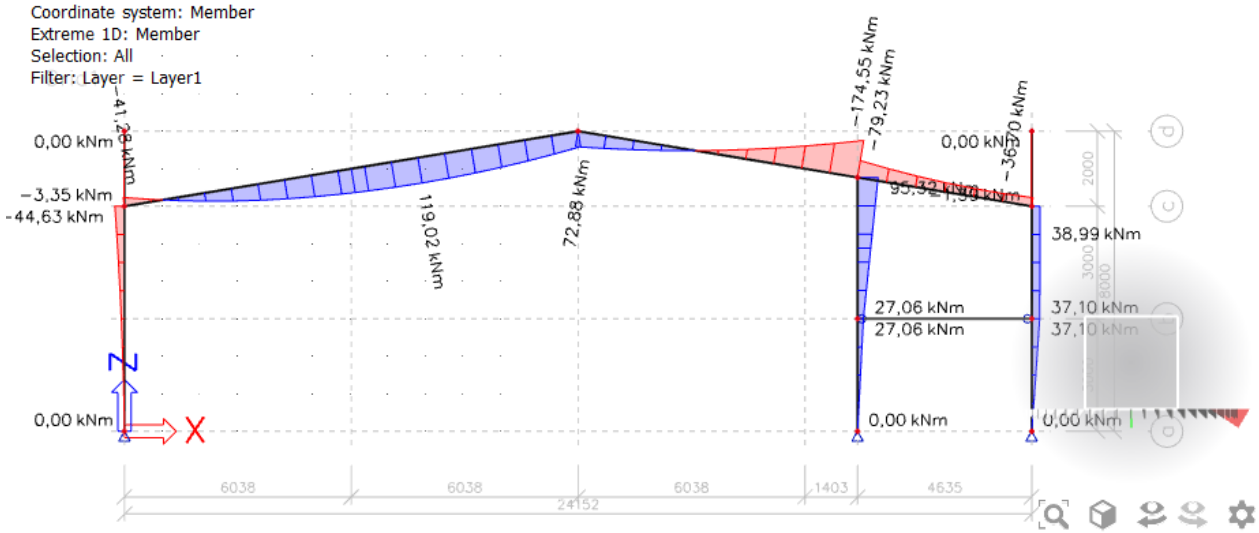
1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_1.1
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



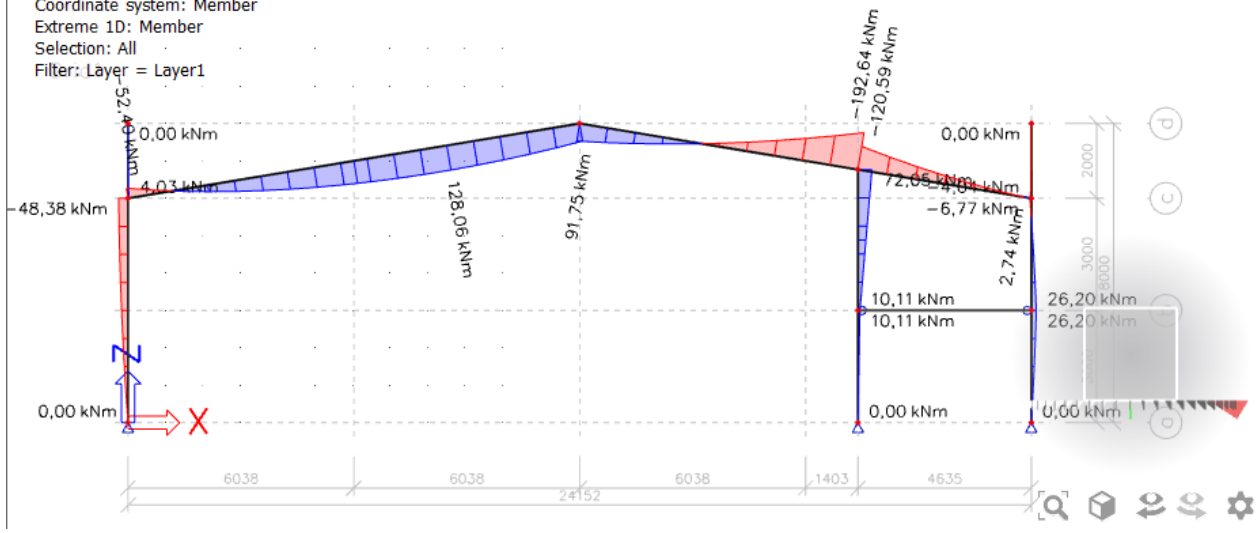
1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_1.2
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



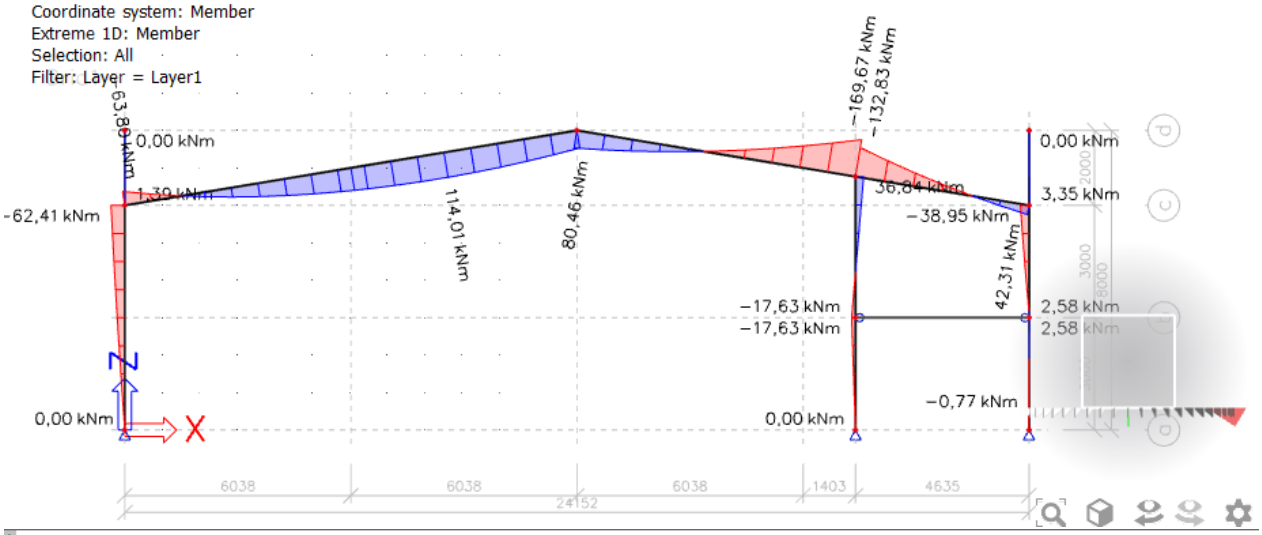
1D internal forces
Values: M_y
Nonlinear calculation
NonLinear Combi: NC_ULS_2.1
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



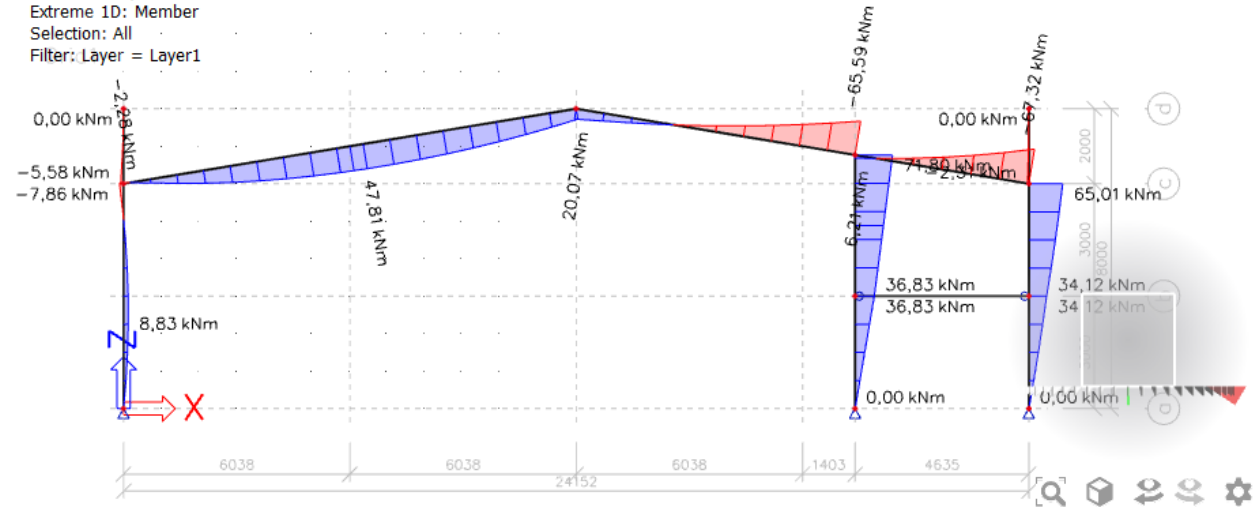
1D internal forces
Values: M_y
Nonlinear calculation
NonLinear Combi: NC_ULS_2.2
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



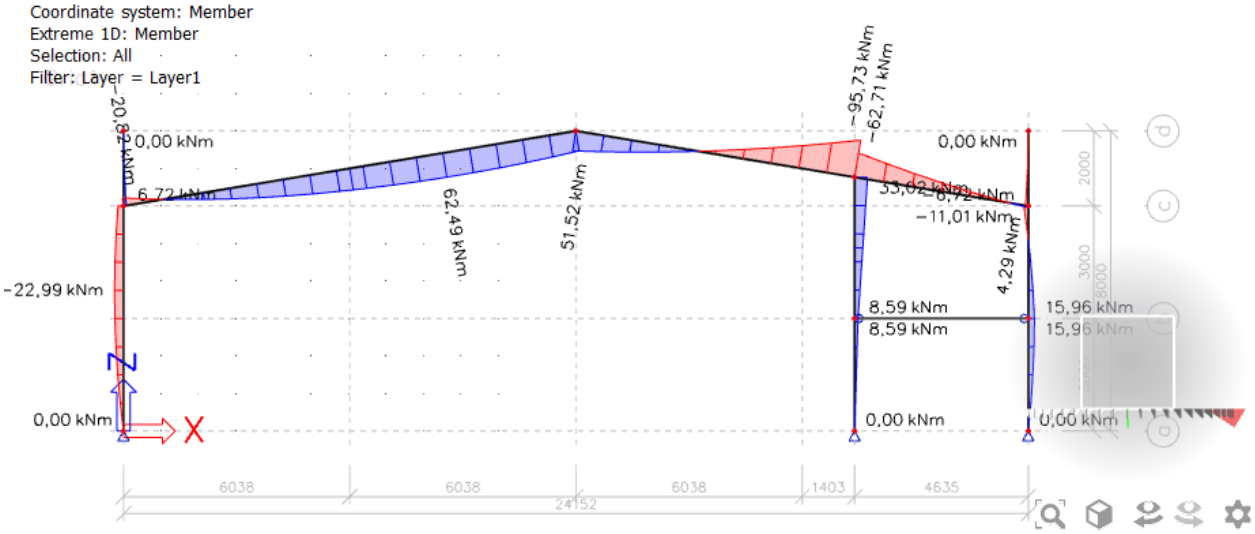
1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.3
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



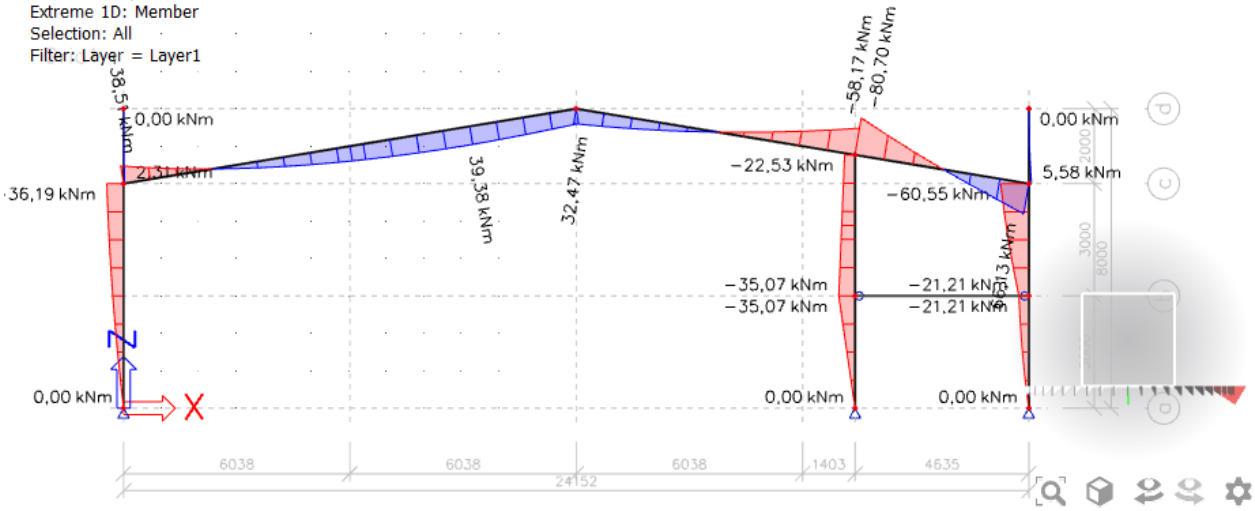
1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.4
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



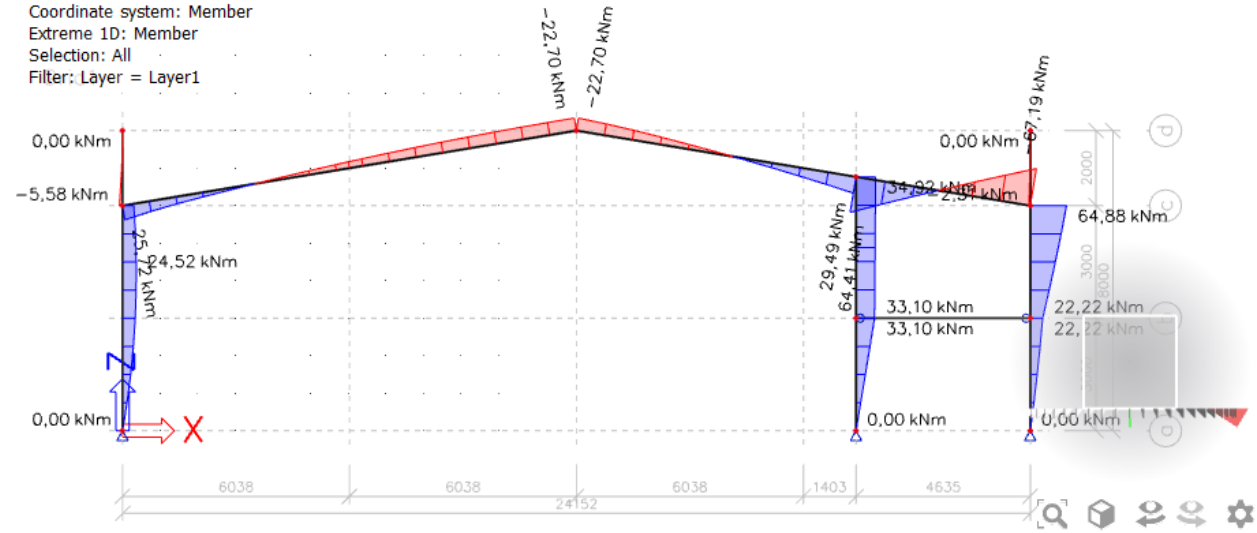
1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.5
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1



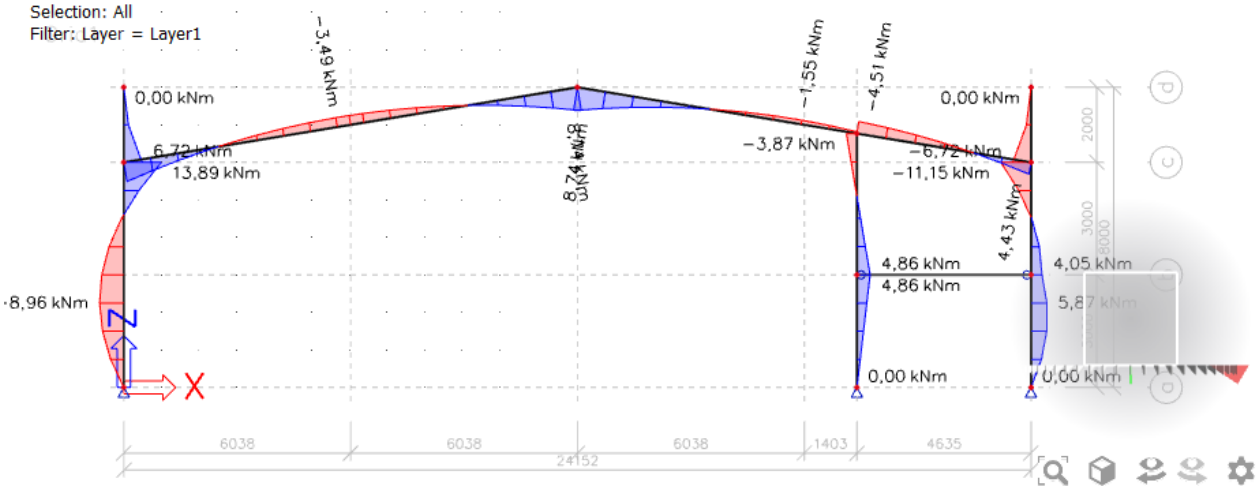
1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.6
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1

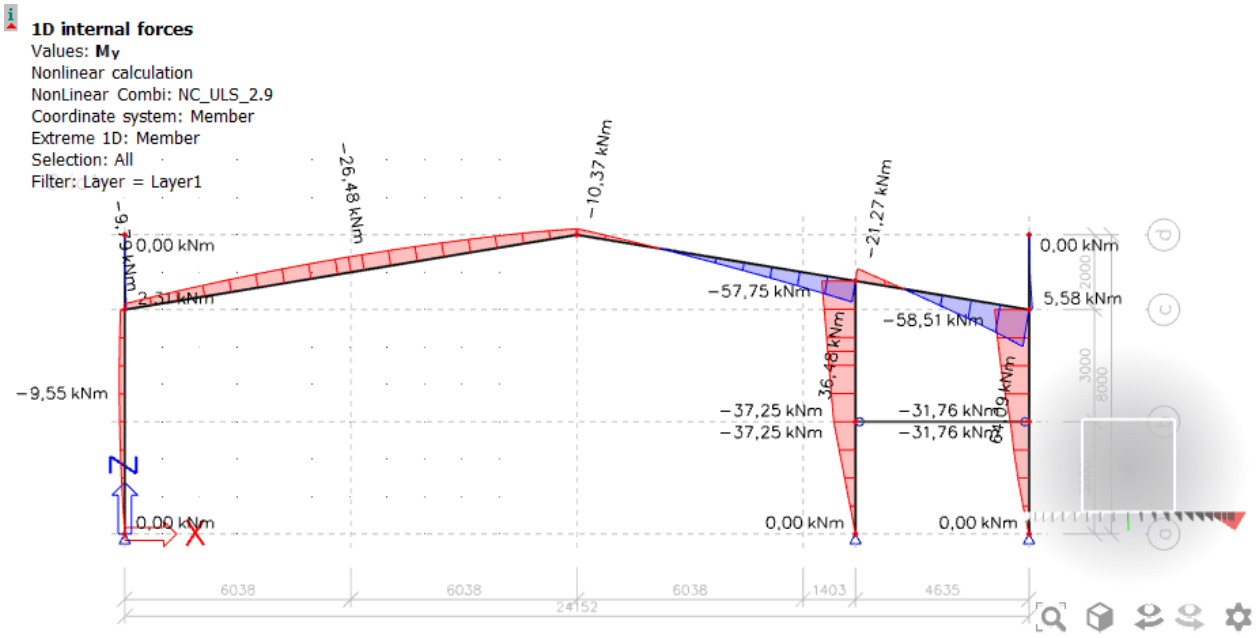


1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.7
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1

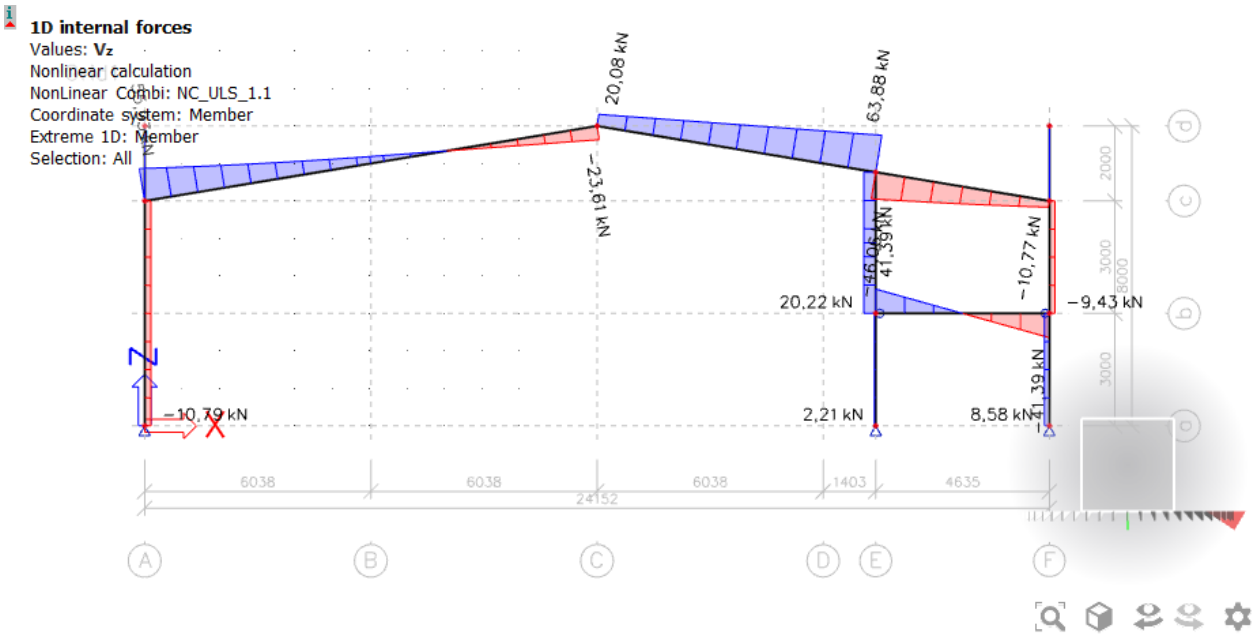


1D internal forces
Values: **My**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.8
Coordinate system: Member
Extreme 1D: Member
Selection: All
Filter: Layer = Layer1

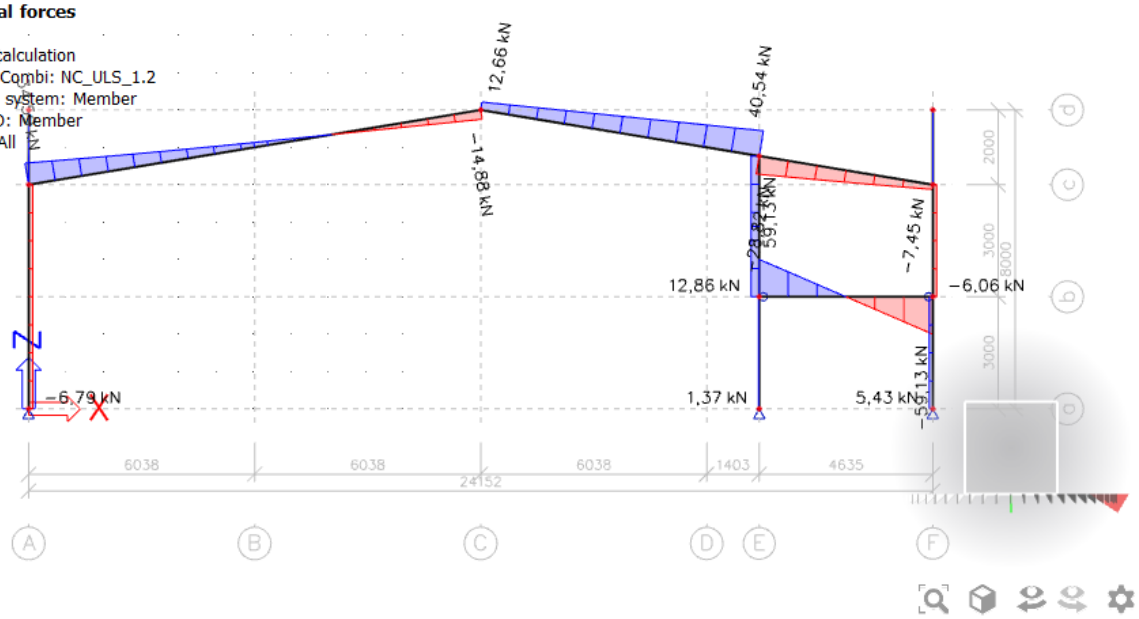




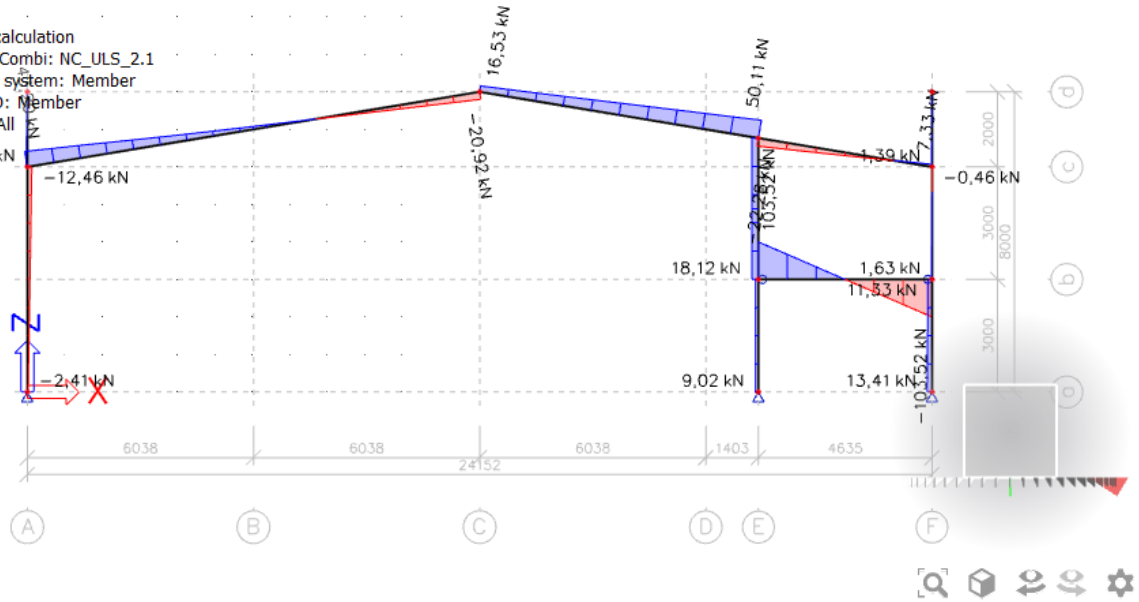
B Axis – Shear Forces



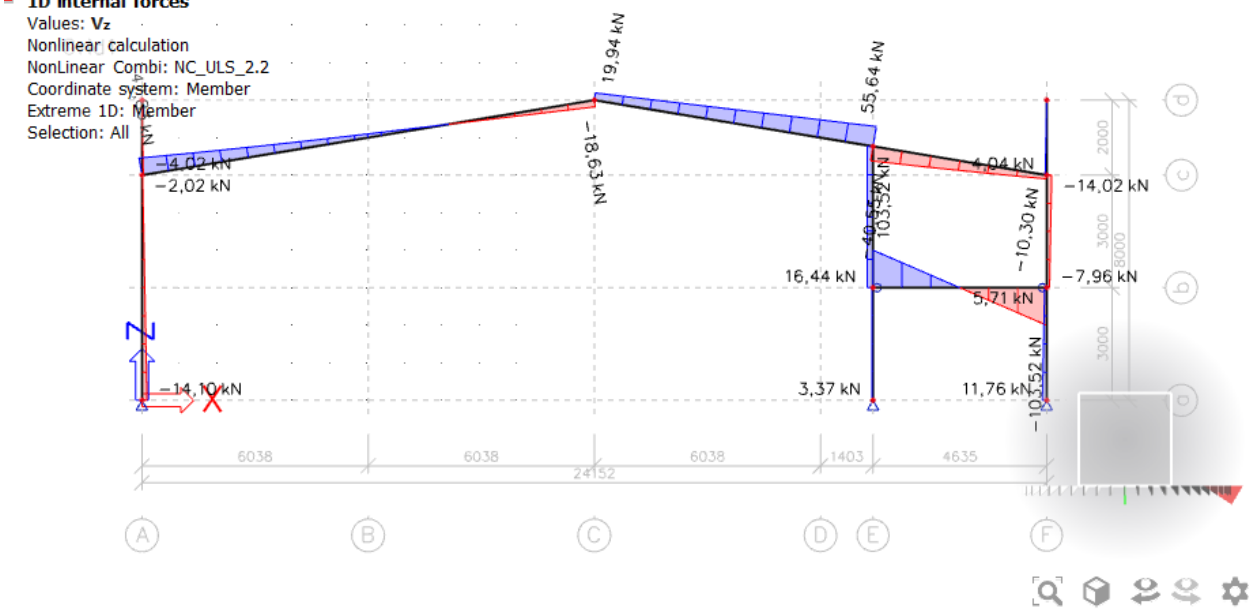
1D internal forces
Values: V_z
Nonlinear calculation
NonLinear Combi: NC_ULS_1.2
Coordinate system: Member
Extreme 1D: Member
Selection: All



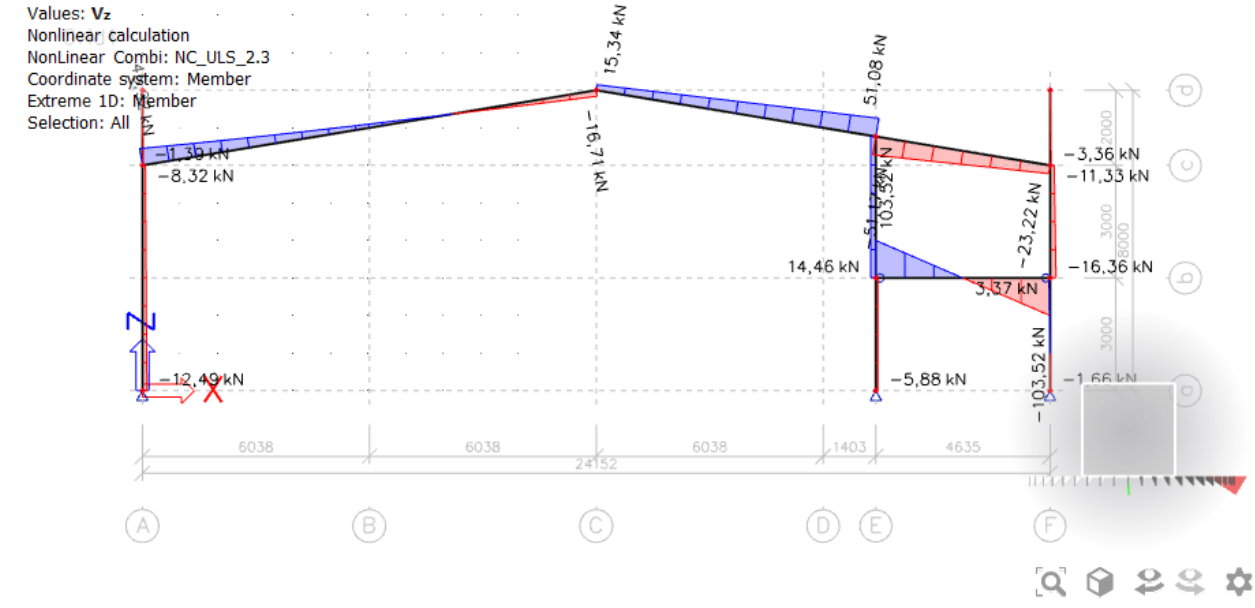
1D internal forces
Values: V_z
Nonlinear calculation
NonLinear Combi: NC_ULS_2.1
Coordinate system: Member
Extreme 1D: Member
Selection: All

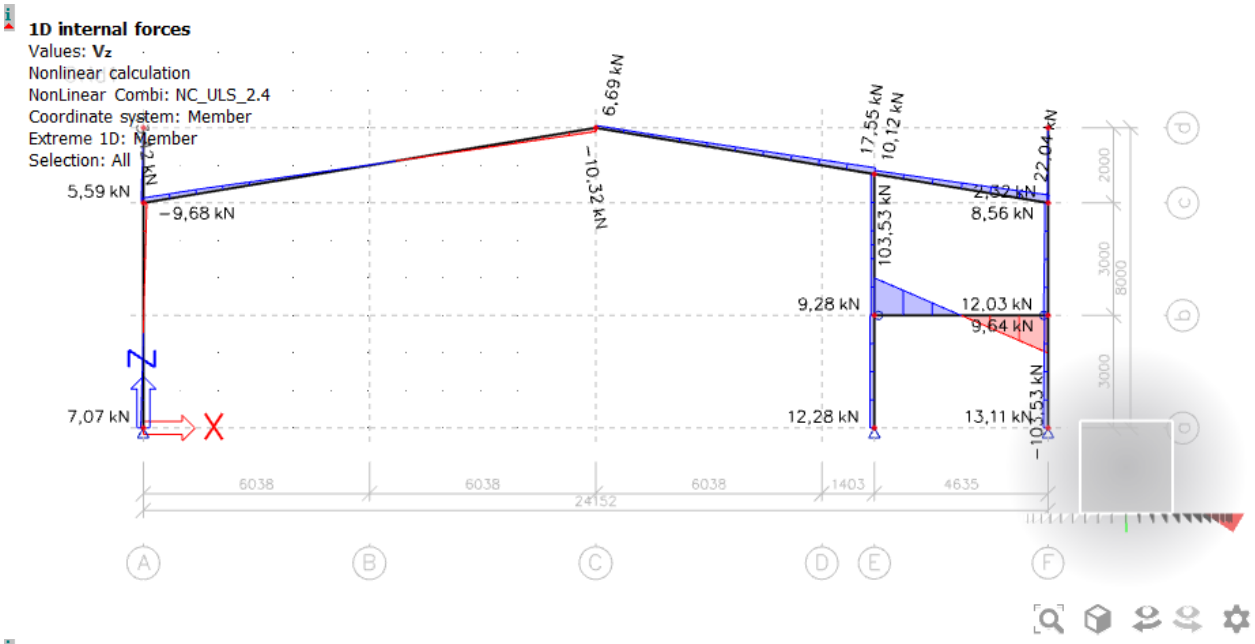


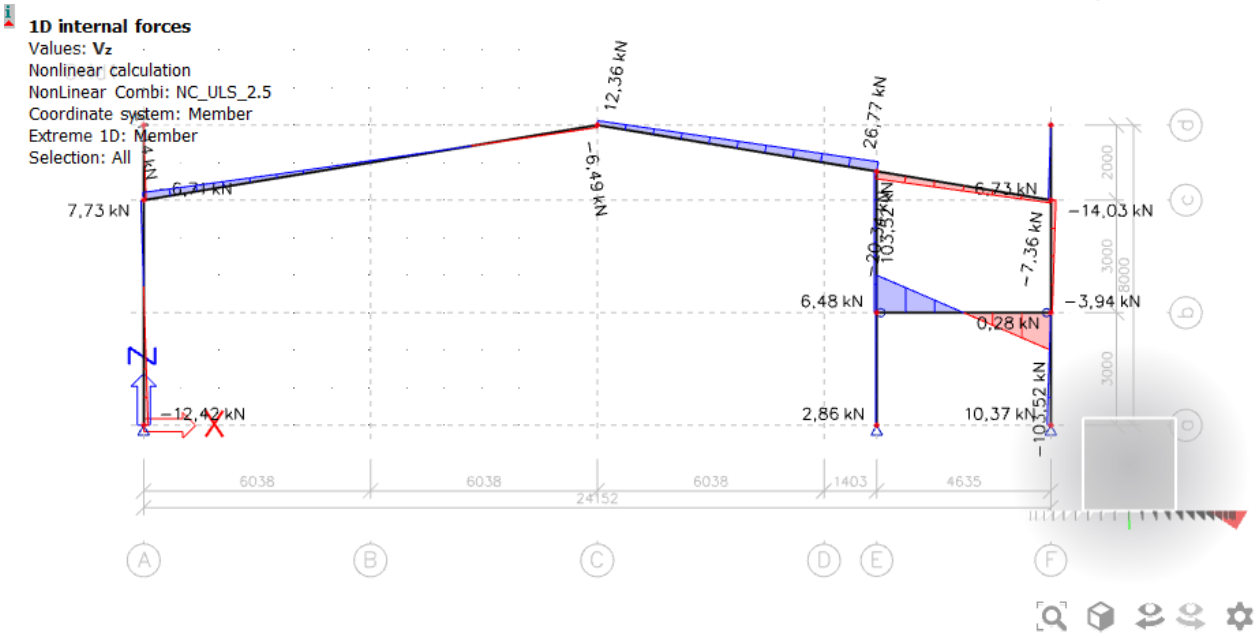
1D internal forces
Values: V_z
Nonlinear calculation
NonLinear Combi: NC_ULS_2.2
Coordinate system: Member
Extreme 1D: Member
Selection: All



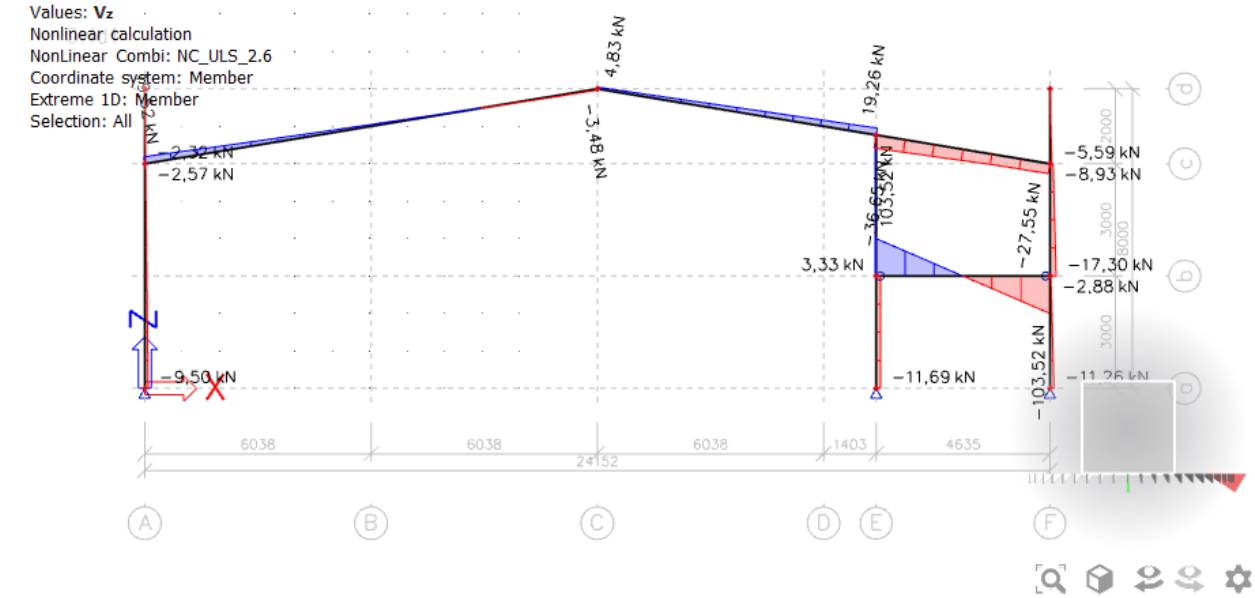
1D internal forces
Values: V_z
Nonlinear calculation
NonLinear Combi: NC_ULS_2.3
Coordinate system: Member
Extreme 1D: Member
Selection: All



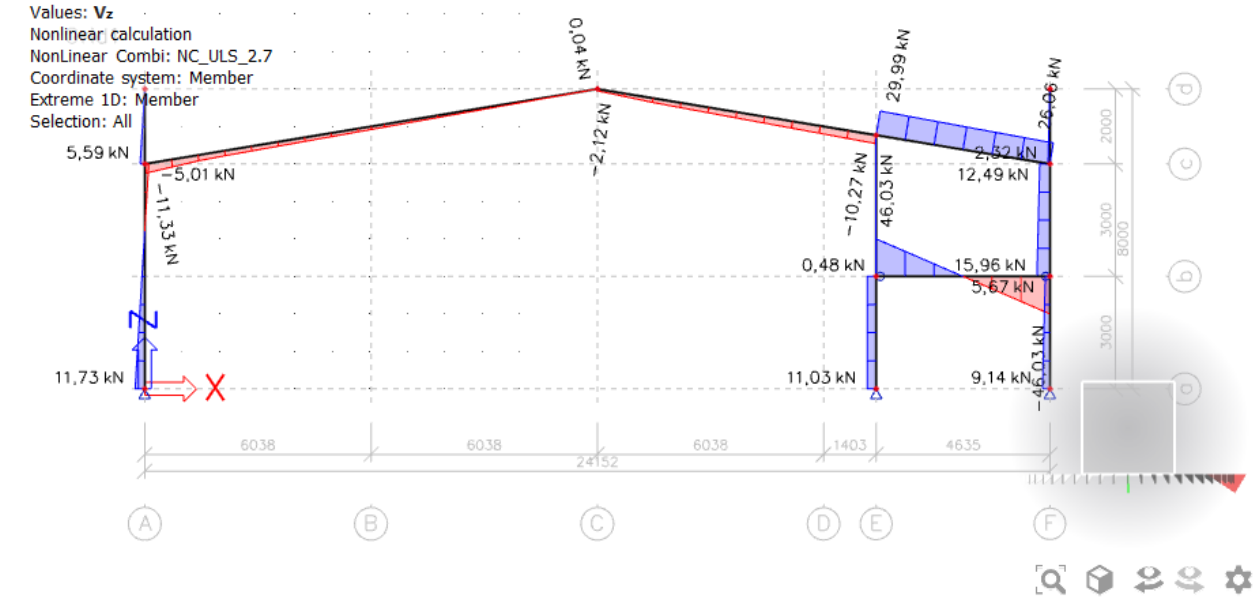

1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_2.4
Coordinate system: Member
Extreme 1D: Member
Selection: All
5,59 kN
−9,68 kN
6,69 kN
−10,32 kN
17,55 kN
10,12 kN
22,04 kN
2,32 kN
8,56 kN
103,53 kN
9,28 kN
12,03 kN
9,64 kN
7,07 kN
12,28 kN
13,11 kN
−103,53 kN
6038
6038
6038
1403
4635
24152
2000
3000
8000
3000
A
B
C
D
E
F


1D internal forces
Values: Vz
Nonlinear calculation
NonLinear Combi: NC_ULS_2.5
Coordinate system: Member
Extreme 1D: Member
Selection: All
7,73 kN
−6,71 kN
12,36 kN
−6,49 kN
26,77 kN
−6,73 kN
−14,03 kN
−7,36 kN
6,48 kN
−3,94 kN
0,28 kN
−12,42 kN
2,86 kN
10,37 kN
−103,52 kN
6038
6038
6038
1403
4635
24152
2000
3000
8000
3000
A
B
C
D
E
F

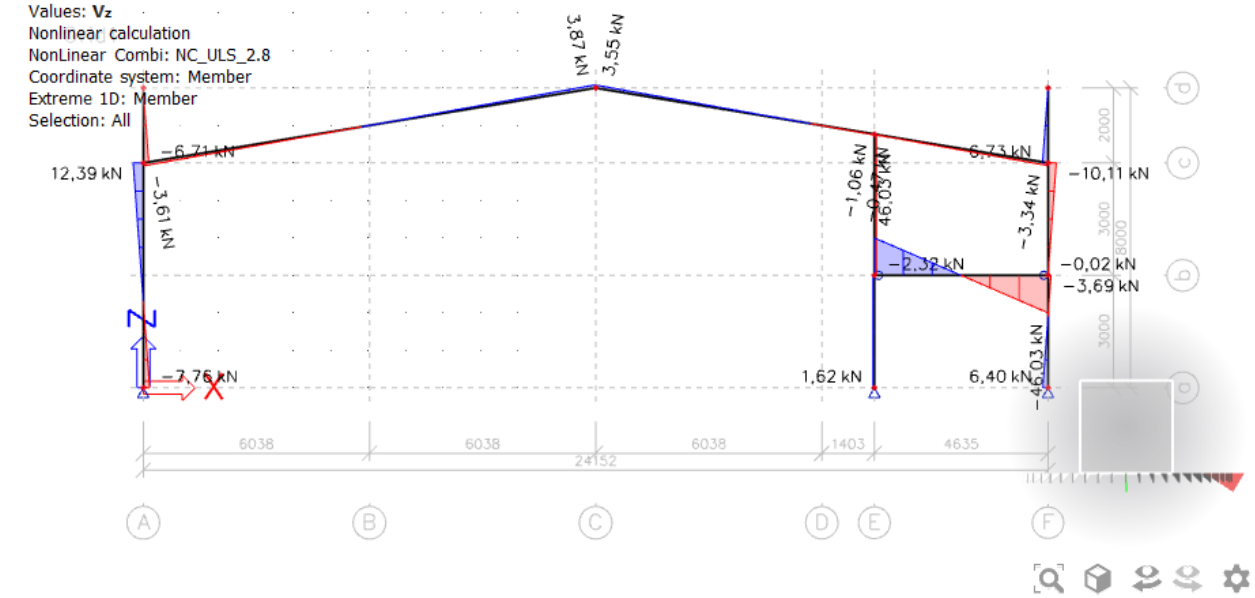
1D internal forces
Values: V_z
Nonlinear calculation
NonLinear Combi: NC_ULS_2.6
Coordinate system: Member
Extreme 1D: Member
Selection: All



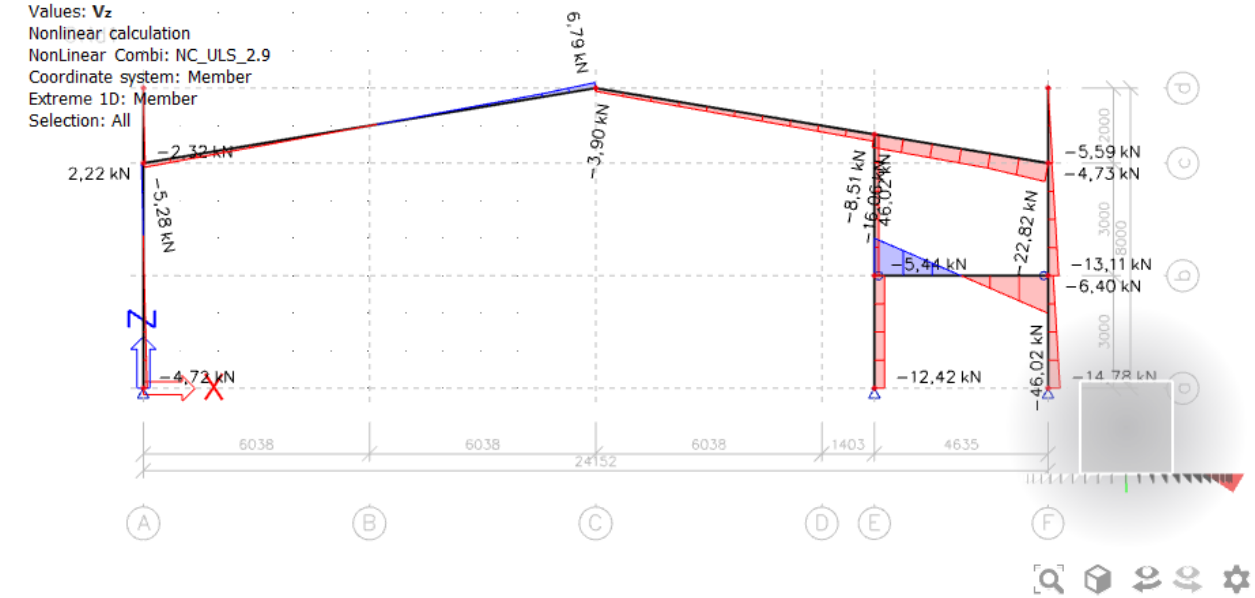
1D internal forces
Values: V_z
Nonlinear calculation
NonLinear Combi: NC_ULS_2.7
Coordinate system: Member
Extreme 1D: Member
Selection: All



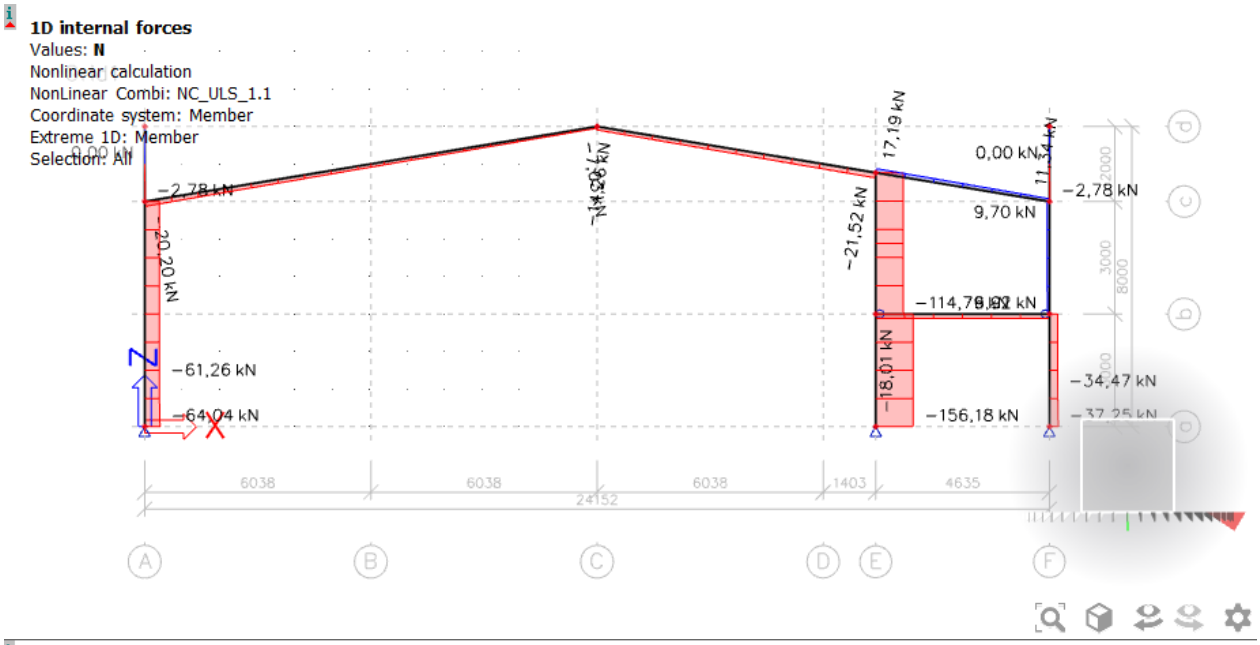
1D internal forces
Values: **Vz**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.8
Coordinate system: Member
Extreme 1D: Member
Selection: All

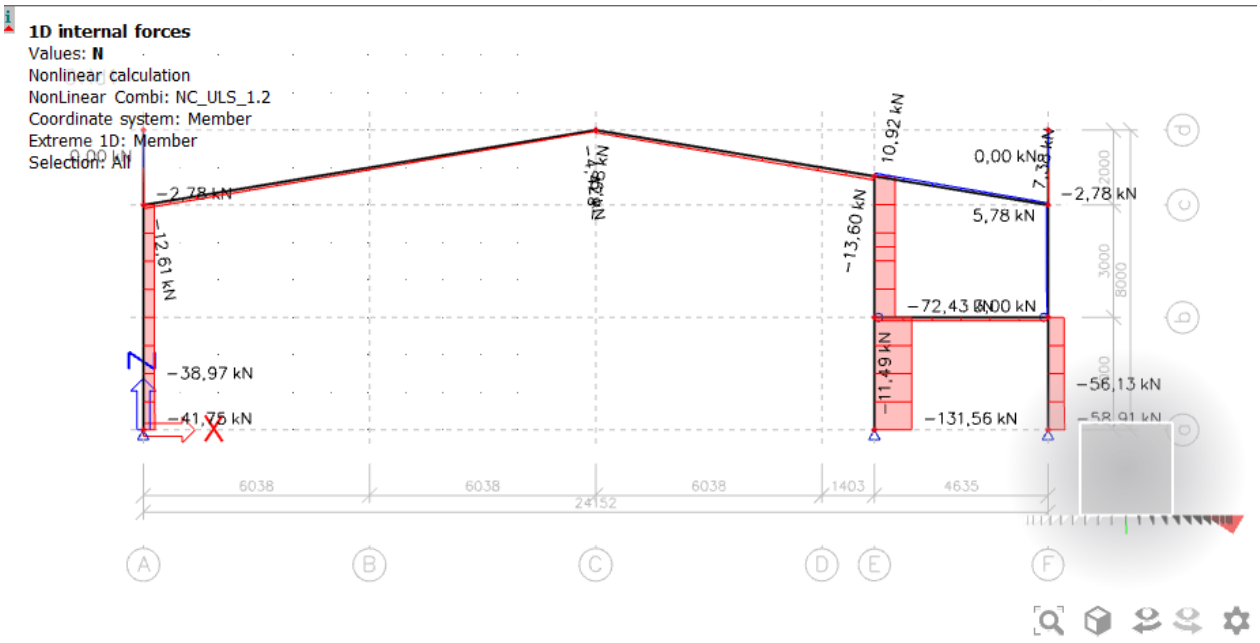


1D internal forces
Values: **Vz**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.9
Coordinate system: Member
Extreme 1D: Member
Selection: All

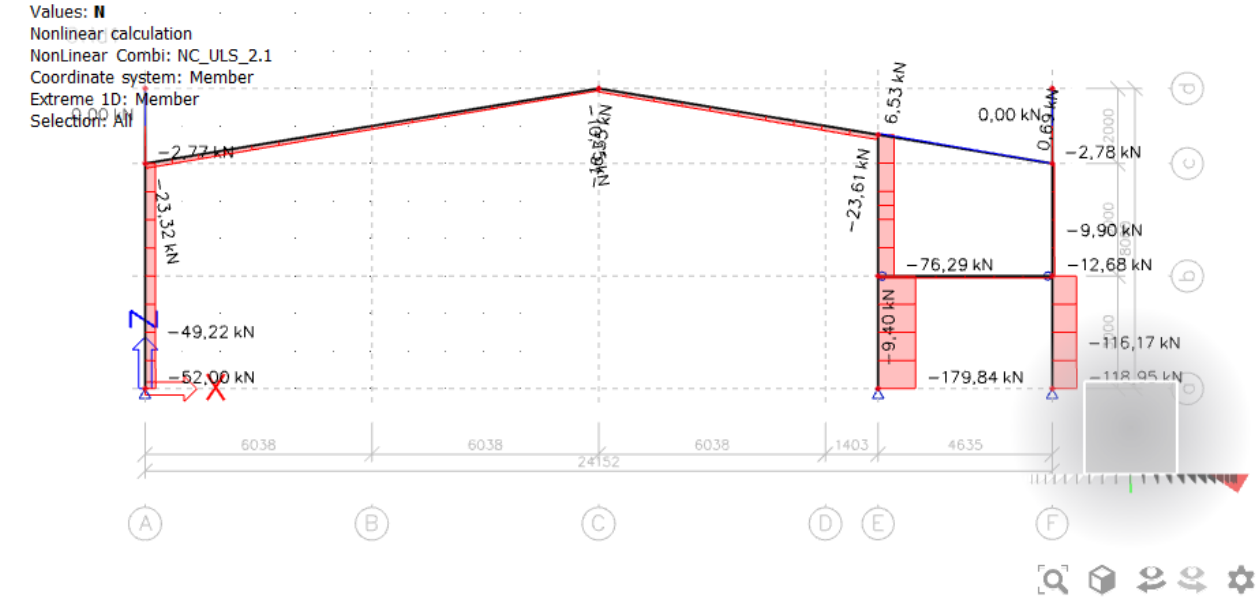


B Axis – Normal forces

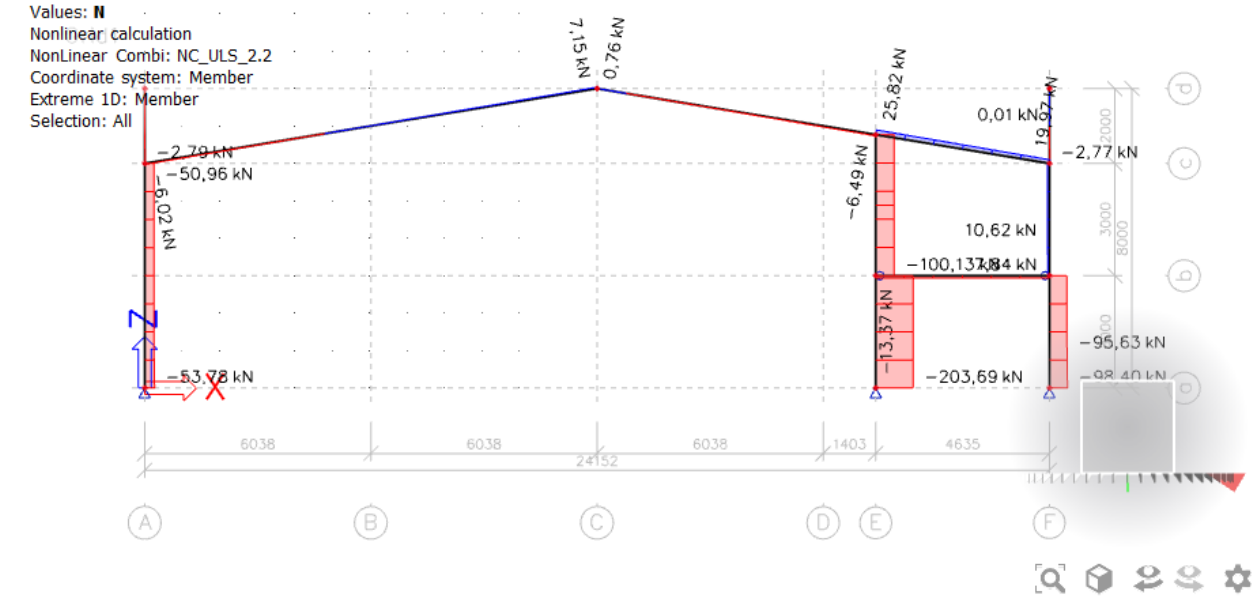




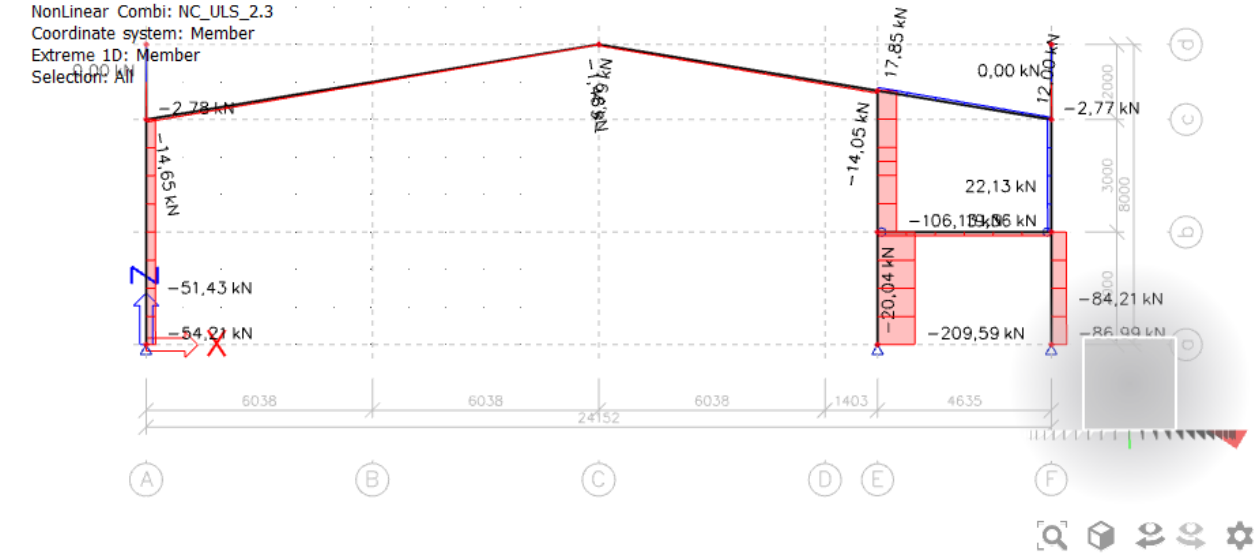
1D internal forces
Values: **N**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.1
Coordinate system: Member
Extreme 1D: Member
Selection: All



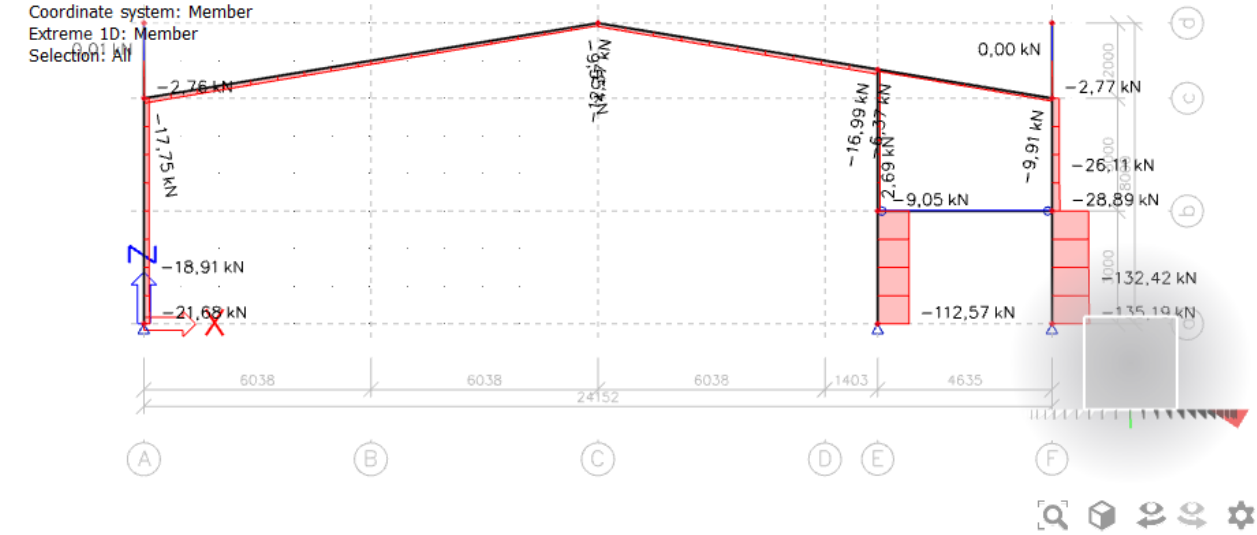
1D internal forces
Values: **N**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.2
Coordinate system: Member
Extreme 1D: Member
Selection: All

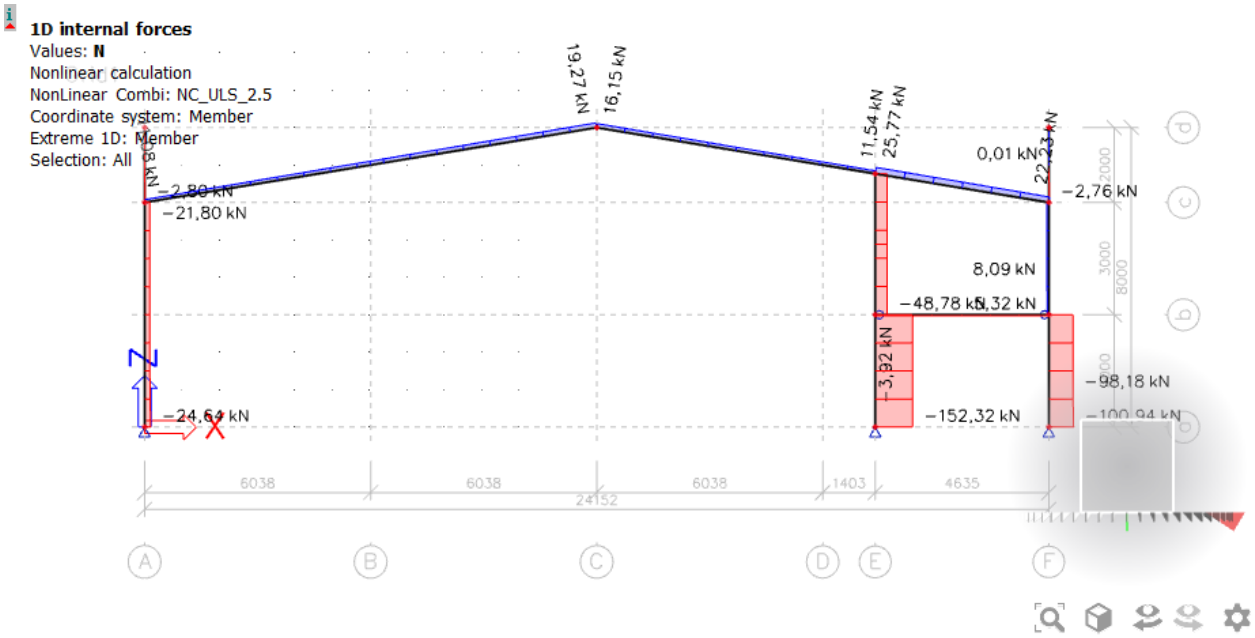


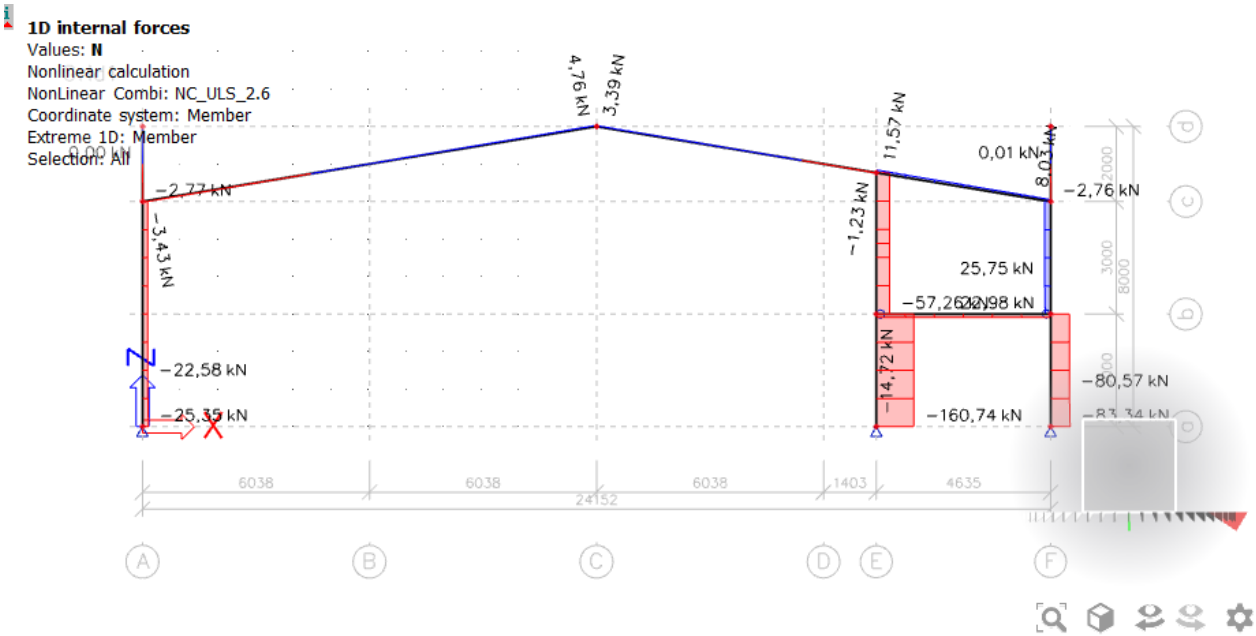
1D internal forces
Values: **N**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.3
Coordinate system: Member
Extreme 1D: Member
Selection: All

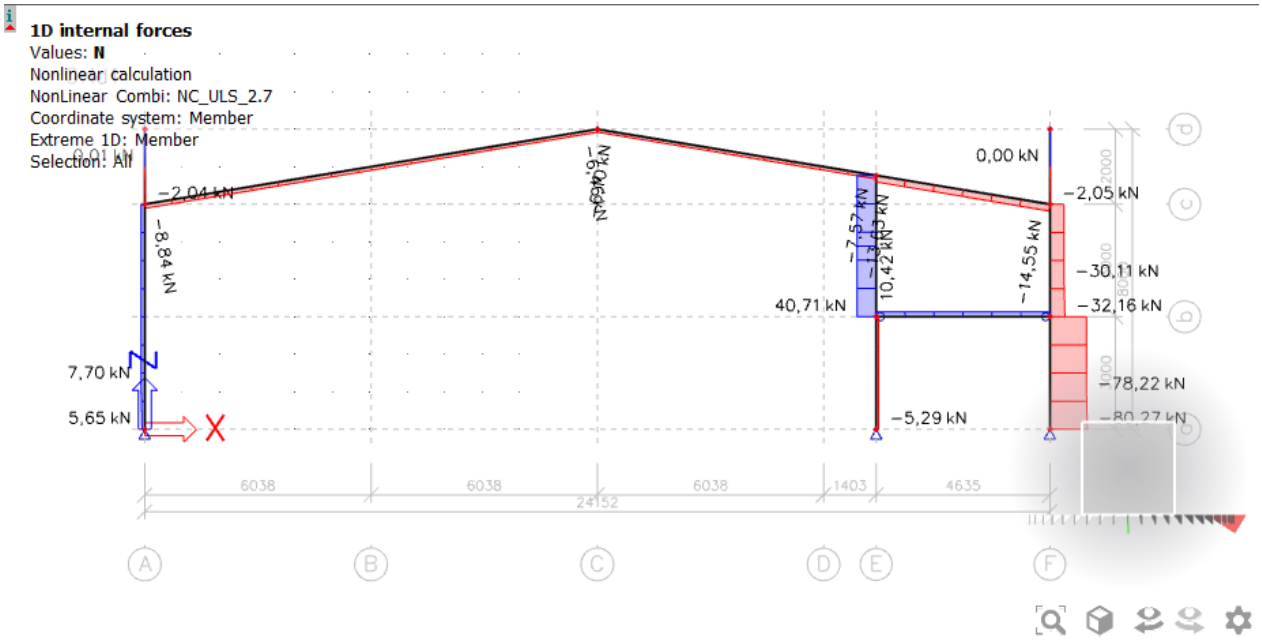


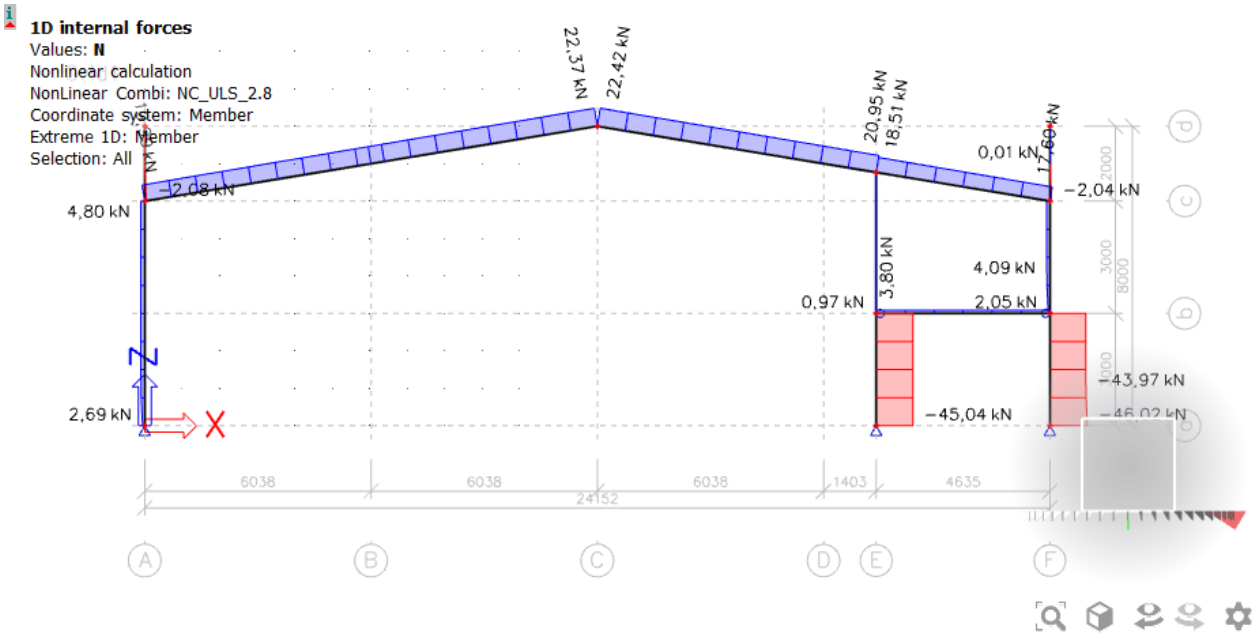
1D internal forces
Values: **N**
Nonlinear calculation
NonLinear Combi: NC_ULS_2.4
Coordinate system: Member
Extreme 1D: Member
Selection: All

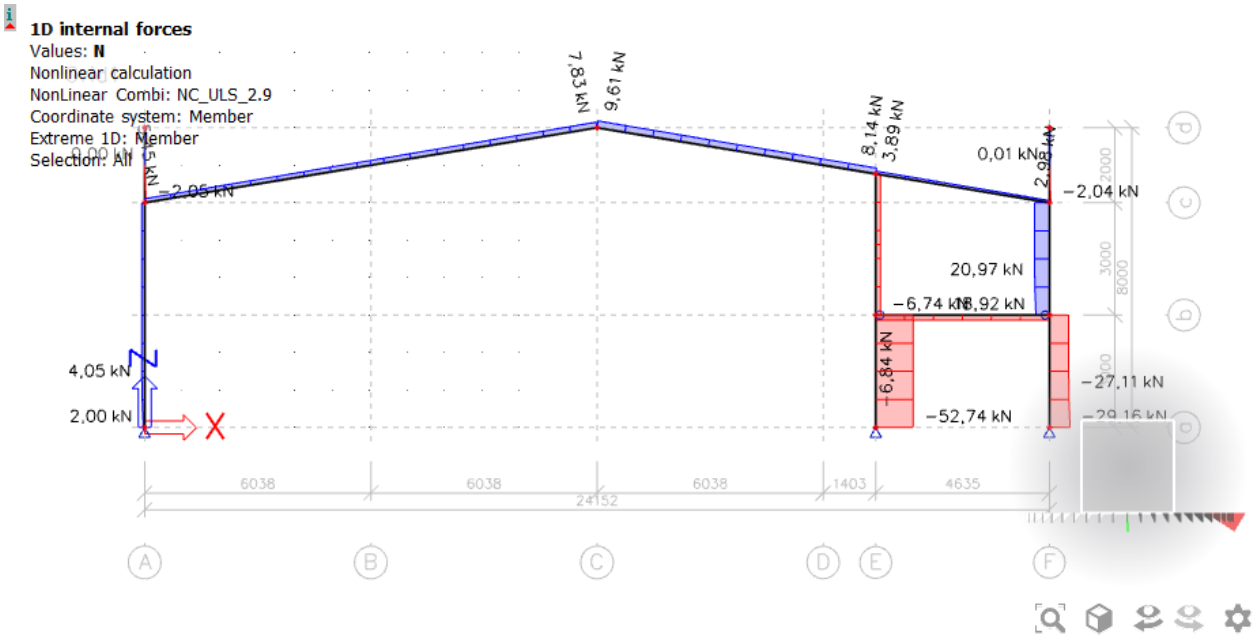



1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_2.5
Coordinate system: Member
Extreme 1D: Member
Selection: All
19,27 kN
16,15 kN
11,54 kN
25,77 kN
0,01 kN
22,23 kN
−2,76 kN
−2,80 kN
−21,80 kN
8,09 kN
−48,78 kN
−3,92 kN
−98,18 kN
−24,64 kN
−152,32 kN
6038
6038
6038
1403
4635
24152
A
B
C
D
E
F


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_2.6
Coordinate system: Member
Extreme 1D: Member
Selection: All
4,76 kN
3,39 kN
11,57 kN
0,01 kN
8,03 kN
−2,76 kN
−2,77 kN
−3,43 kN
−1,23 kN
25,75 kN
−14,72 kN
−80,57 kN
−22,58 kN
−160,74 kN
6038
6038
6038
1403
4635
24152
A
B
C
D
E
F


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_2.7
Coordinate system: Member
Extreme 1D: Member
Selection: All
0,01 kN
−2,04 kN
−8,84 kN
−6,46 kN
0,00 kN
−2,05 kN
−7,57 kN
−13,63 kN
10,42 kN
−14,55 kN
−30,11 kN
−32,16 kN
40,71 kN
7,70 kN
5,65 kN
−78,22 kN
−5,29 kN
6038
6038
6038
1403
4635
24152
A
B
C
D
E
F


1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_2.8
Coordinate system: Member
Extreme 1D: Member
Selection: All
22,37 kN
22,42 kN
20,95 kN
18,51 kN
17,60 kN
0,01 kN
−2,08 kN
−2,04 kN
4,80 kN
3,80 kN
4,09 kN
0,97 kN
2,05 kN
−43,97 kN
−45,04 kN
2,69 kN
6038
6038
6038
1403
4635
24152
A
B
C
D
E
F

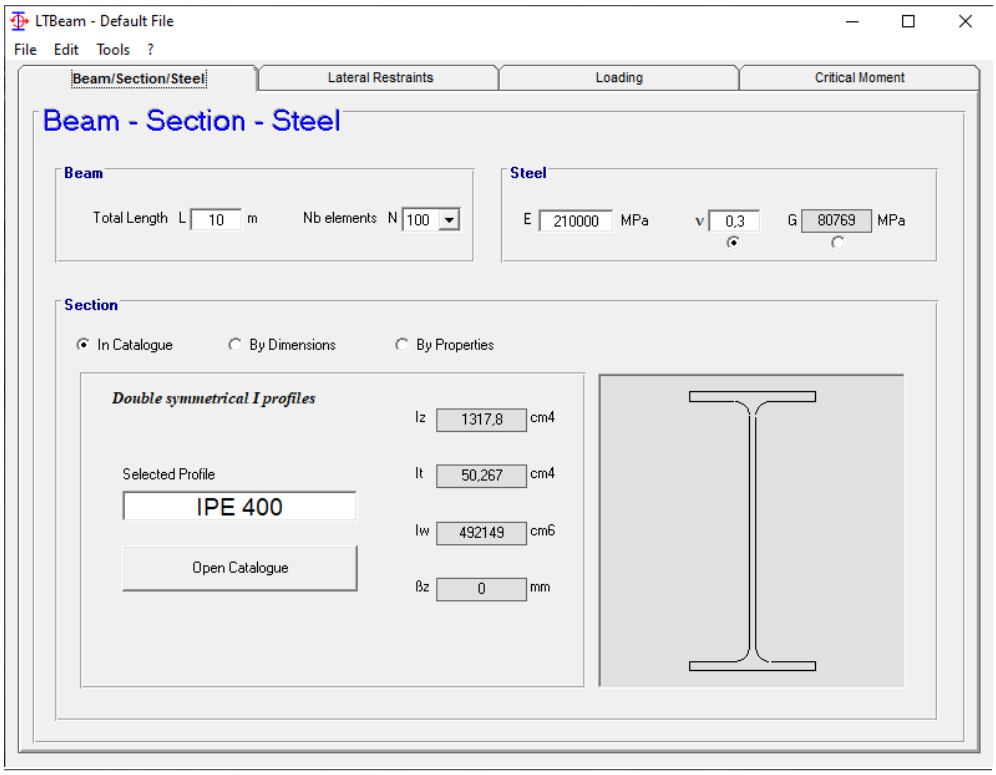

1D internal forces
Values: N
Nonlinear calculation
NonLinear Combi: NC_ULS_2.9
Coordinate system: Member
Extreme 1D: Member
Selection: All
7,83 kN
9,61 kN
8,14 kN
3,89 kN
0,01 kN
2,94 kN
−2,04 kN
20,97 kN
−6,74 kN
8,92 kN
−6,84 kN
−27,11 kN
−52,74 kN
4,05 kN
2,00 kN
6038
6038
6038
1403
4635
24152
A
B
C
D
E
F

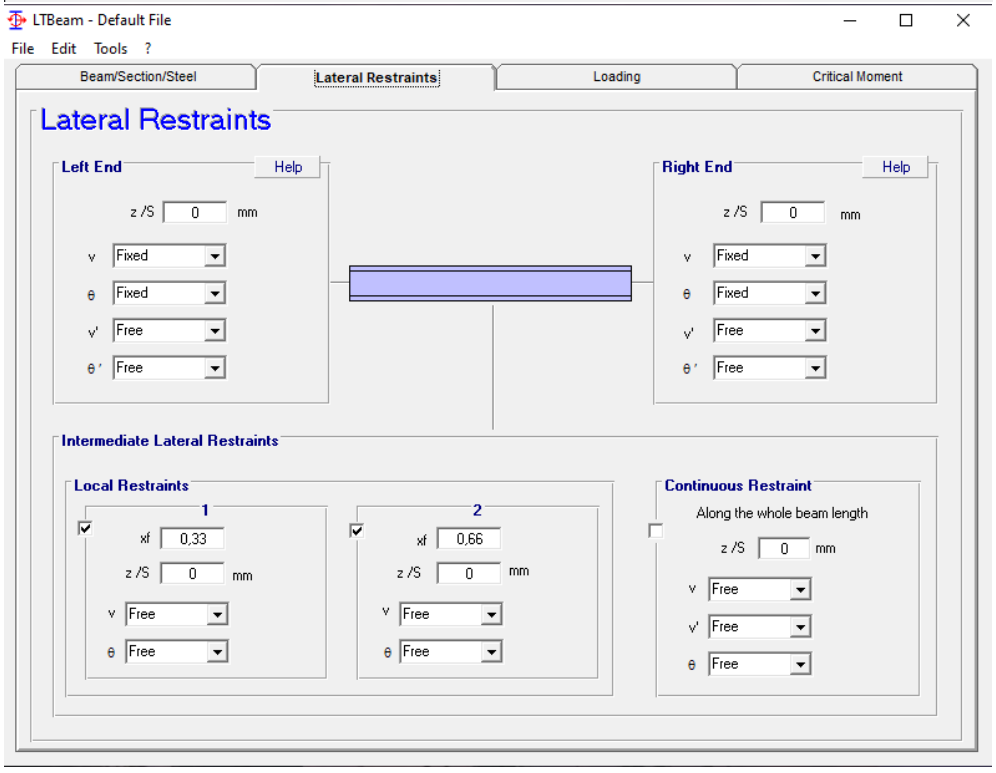
APPENDIX C

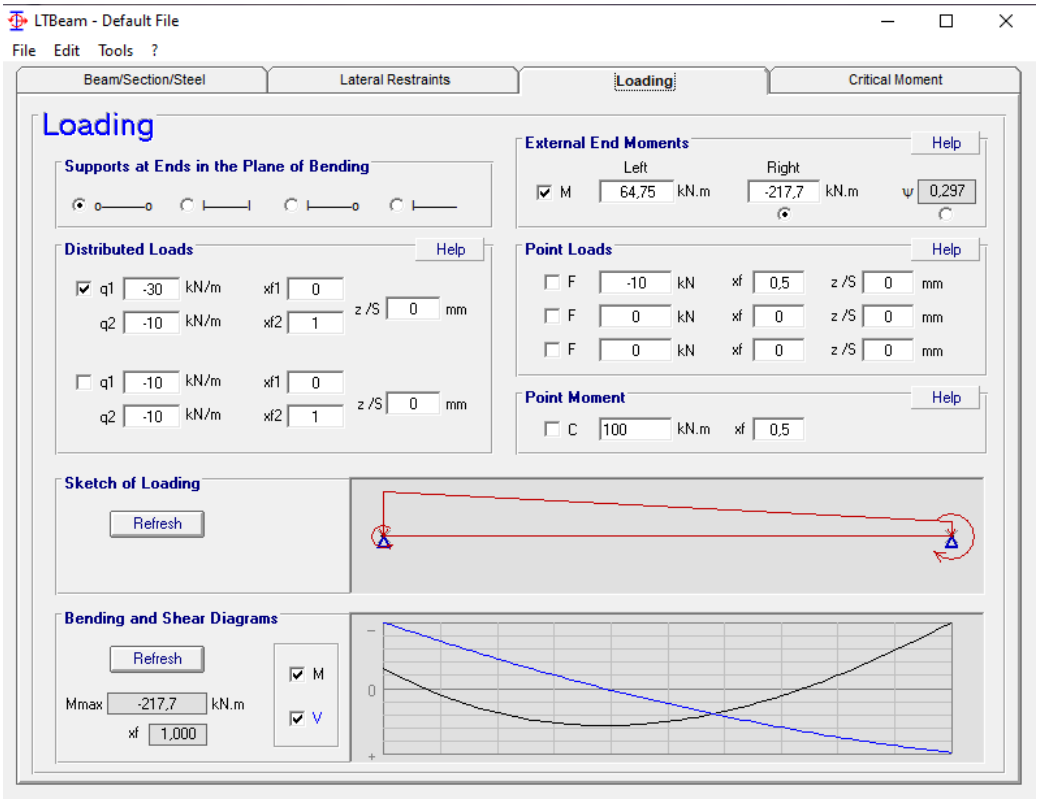
Results from LTBeam for the beam on B axis

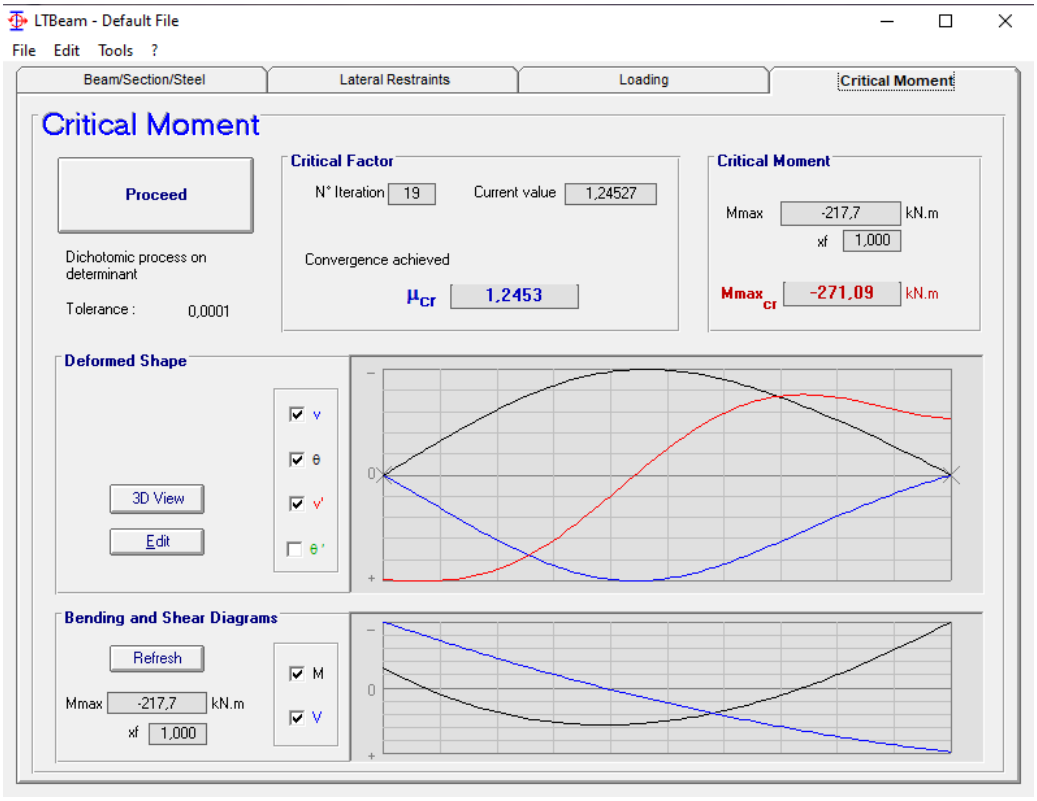
This part contains the output for the main beam on B axis

LT Beam results






LTBeam - Default File
File Edit Tools ?
Beam/Section/Steel
Lateral Restraints
Loading
Critical Moment
Loading
Supports at Ends in the Plane of Bending
External End Moments
Help
Left
Right
M 64,75 kN.m -217,7 kN.m ψ 0,297
Distributed Loads
Help
q1 -30 kN/m xf1 0
q2 -10 kN/m xf2 1 z /S 0 mm
q1 -10 kN/m xf1 0
q2 -10 kN/m xf2 1 z /S 0 mm
Point Loads
Help
F -10 kN xf 0,5 z /S 0 mm
F 0 kN xf 0 z /S 0 mm
F 0 kN xf 0 z /S 0 mm
Point Moment
Help
C 100 kN.m xf 0,5
Sketch of Loading
Refresh
Bending and Shear Diagrams
Refresh
Mmax -217,7 kN.m
xf 1,000
M
V


LTBeam - Default File
File Edit Tools ?
Beam/Section/Steel
Lateral Restraints
Loading
Critical Moment
Critical Moment
Proceed
Dichotomic process on determinant
Tolerance : 0,0001
Critical Factor
N° Iteration 19
Current value 1,24527
Convergence achieved
μCr 1,2453
Critical Moment
Mmax -217,7 kN.m
xf 1,000
Mmax cr -271,09 kN.m
Deformed Shape
3D View
Edit
v
θ
v'
θ'
Bending and Shear Diagrams
Refresh
Mmax -217,7 kN.m
xf 1,000
M
V

APPENDIX D

Trapozedial sheets for the mezzanine and the roof

Trapozeidal sheet for mezzanine

Nominální tl. t_{nom} [mm]	Vlastní tíha g [kg/m²]	Mezní stav	TR 50/250, spojitý nosník o čtyřech polích, pozitivní poloha										
			Rozpon [m]										
			1,00	1,50	2,00	2,50	3,00	3,50	4,00	4,50	5,00	5,50	6,00
0,63	6,30	q_{Rd1}	10,24	5,54	3,49	2,41	1,76	1,35	1,06	0,86	0,69	0,57	0,48
		q_{Rd2}	7,40	4,87	3,13	2,19	1,62	1,25	0,99	0,81	0,67	0,57	0,48
		q_{Rk}	25,60	7,59	3,20	1,64	0,95	0,60	0,40	0,28	0,20	0,15	0,12
0,75	7,50	q_{Rd1}	14,43	7,77	4,88	3,36	2,46	1,87	1,48	1,17	0,95	0,79	0,66
		q_{Rd2}	10,90	6,84	4,38	3,06	2,26	1,74	1,38	1,12	0,93	0,79	0,66
		q_{Rk}	32,57	9,65	4,07	2,08	1,21	0,76	0,51	0,36	0,26	0,20	0,15
0,88	8,80	q_{Rd1}	19,32	10,28	6,41	4,39	3,19	2,43	1,87	1,48	1,20	0,99	0,83
		q_{Rd2}	15,39	9,08	5,78	4,01	2,95	2,26	1,79	1,45	1,20	0,99	0,83
		q_{Rk}	40,61	12,03	5,08	2,60	1,50	0,95	0,63	0,45	0,32	0,24	0,19
1,00	10,00	q_{Rd1}	24,26	12,80	7,94	5,41	3,93	2,95	2,26	1,79	1,45	1,20	1,00
		q_{Rd2}	20,17	11,34	7,17	4,96	3,64	2,78	2,20	1,78	1,45	1,20	1,00
		q_{Rk}	48,61	14,40	6,08	3,11	1,80	1,13	0,76	0,53	0,39	0,29	0,23
1,13	11,30	q_{Rd1}	30,06	15,74	9,70	6,59	4,77	3,52	2,69	2,13	1,73	1,43	1,20
		q_{Rd2}	25,87	13,96	8,79	6,06	4,43	3,38	2,67	2,13	1,73	1,43	1,20
		q_{Rk}	58,60	17,36	7,32	3,75	2,17	1,37	0,92	0,64	0,47	0,35	0,27
1,25	12,50	q_{Rd1}	35,79	18,61	11,43	7,74	5,52	4,06	3,11	2,46	1,99	1,65	1,38
		q_{Rd2}	30,83	16,54	10,37	7,13	5,20	3,96	3,11	2,46	1,99	1,65	1,38
		q_{Rk}	68,29	20,23	8,54	4,37	2,53	1,59	1,07	0,75	0,55	0,41	0,32

Trapozeidal sheet for roofing

BALEXMETAL

Trapezoidal sheet TR 85.280.1120 POSITIVE

3-span configuration

Nominal thickness t_{nom} [mm]	Mass [kg/m²]	J_x [cm⁴] min / max	Positive Condition	Span spread between supports [m]															
				1,50	1,80	2,10	2,40	2,70	3,00	3,30	3,60	3,90	4,20	4,50	4,80	5,10	5,40	5,70	6,00
0,75	7,89	88,41	SGN	8,03	6,69	5,74	4,98	4,16	3,53	3,04	2,65	2,33	2,06	1,84	1,65	1,49	1,35	1,23	1,13
			L/150	8,03	6,69	5,74	4,98	4,16	3,53	3,04	2,65	2,33	2,06	1,84	1,65	1,41	1,19	1,02	0,87
		97,16	L/200	8,03	6,69	5,74	4,98	4,16	3,53	3,04	2,65	2,33	1,89	1,55	1,28	1,07	0,91	0,77	0,67
			L/300	8,03	6,69	5,74	4,98	4,16	3,44	2,61	2,03	1,60	1,29	1,06	0,87	0,73	0,61	0,52	0,45
0,88	9,25	109,16	SGN	11,35	9,46	7,97	6,50	5,41	4,59	3,94	3,42	3,00	2,66	2,37	2,12	1,91	1,73	1,58	1,45
			L/150	11,35	9,46	7,97	6,50	5,41	4,59	3,94	3,42	3,00	2,66	2,37	2,02	1,70	1,43	1,22	1,05
		114,00	L/200	11,35	9,46	7,97	6,50	5,41	4,59	3,94	3,42	2,83	2,28	1,86	1,53	1,28	1,08	0,92	0,79
			L/300	11,35	9,46	7,97	6,50	5,41	4,16	3,15	2,42	1,91	1,53	1,24	1,02	0,85	0,72	0,61	0,52
1,00	10,51	129,23	SGN	14,89	12,41	9,85	8,00	6,65	5,63	4,83	4,19	3,67	3,24	2,88	2,58	2,33	2,11	1,92	1,75
			L/150	14,89	12,41	9,85	8,00	6,65	5,63	4,83	4,19	3,67	3,24	2,82	2,33	1,94	1,63	1,39	1,19
		129,55	L/200	14,89	12,41	9,85	8,00	6,65	5,63	4,83	4,13	3,25	2,60	2,12	1,74	1,45	1,22	1,04	0,89
			L/300	14,89	12,41	9,85	8,00	6,53	4,76	3,58	2,76	2,17	1,74	1,41	1,16	0,97	0,82	0,69	0,60
1,25	13,14	161,94	SGN	23,43	17,80	14,02	11,35	9,40	7,93	6,78	5,86	5,13	4,52	4,01	3,59	3,23	2,92	2,66	2,42
			L/150	23,43	17,80	14,02	11,35	9,40	7,93	6,78	5,86	5,13	4,34	3,53	2,91	2,42	2,04	1,74	1,49
		161,94	L/200	23,43	17,80	14,02	11,35	9,40	7,93	6,71	5,17	4,06	3,25	2,65	2,18	1,82	1,53	1,30	1,12
			L/300	23,43	17,80	14,02	11,35	8,16	5,95	4,47	3,44	2,71	2,17	1,76	1,45	1,21	1,02	0,87	0,74

NOTE: The boundary values of the design load-bearing capacity (SGN) should be compared with design loads. The boundary values of the loads (SGU) due to the deflection should be compared with characteristic loads. The calculations were made in compliance with ENV 1993-1-3:1996/AC:1997 guidelines and respectively γ_m =1.10 was assumed.

APPENDIX E

Additional results from B1 moment connection

Bolts

Name	Bolt assembly	Diameter [mm]	fu [MPa]	Gross area [mm^2]
M16 8.8	M16 8.8	16	800,0	201

Load effects

Name	Member	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	B	-13,1	0,0	-55,1	0,0	51,3	0,0

Check

Rotational stiffness

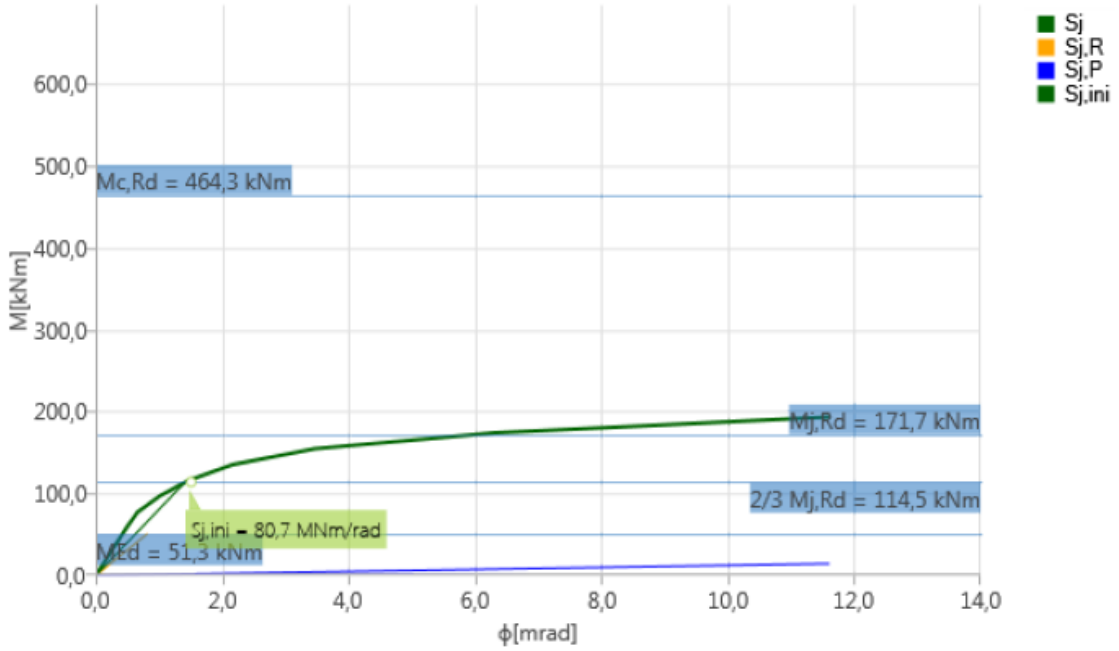
Name	Comp.	Loads	Mj,Rd [kNm]	Sj,ini [MNm/rad]	Φc [mrad]	L [m]	Sj,R [MNm/rad]	Sj,P [MNm/rad]	Class.
B	My	LE1	171,7	80,7	11,6	19,40	62,6	1,3	Rigid

Secant rotational stiffness

Name	Comp.	Loads	M [kNm]	Sjs [MNm/rad]	Φ [mrad]
B	My	LE1	51,3	120,2	0,4

Symbol explanation

$M_{j,Rd}$	Bending resistance
$S_{j,ini}$	Initial rotational stiffness
$S_{j,s}$	Secant rotational stiffness
Φ	Rotational deformation
Φc	Rotational capacity
$S_{j,R}$	Limit value - rigid joint
$S_{j,P}$	Limit value - nominally pinned joint



Stiffness diagram My - ϕy, LE1

Axial stiffness

Name	Component	Loads	N [kN]	Nj,Rd [kN]	dx [mm]	St [MN/m]
B	N	LE1	-13,1	-9,7	0,1	140

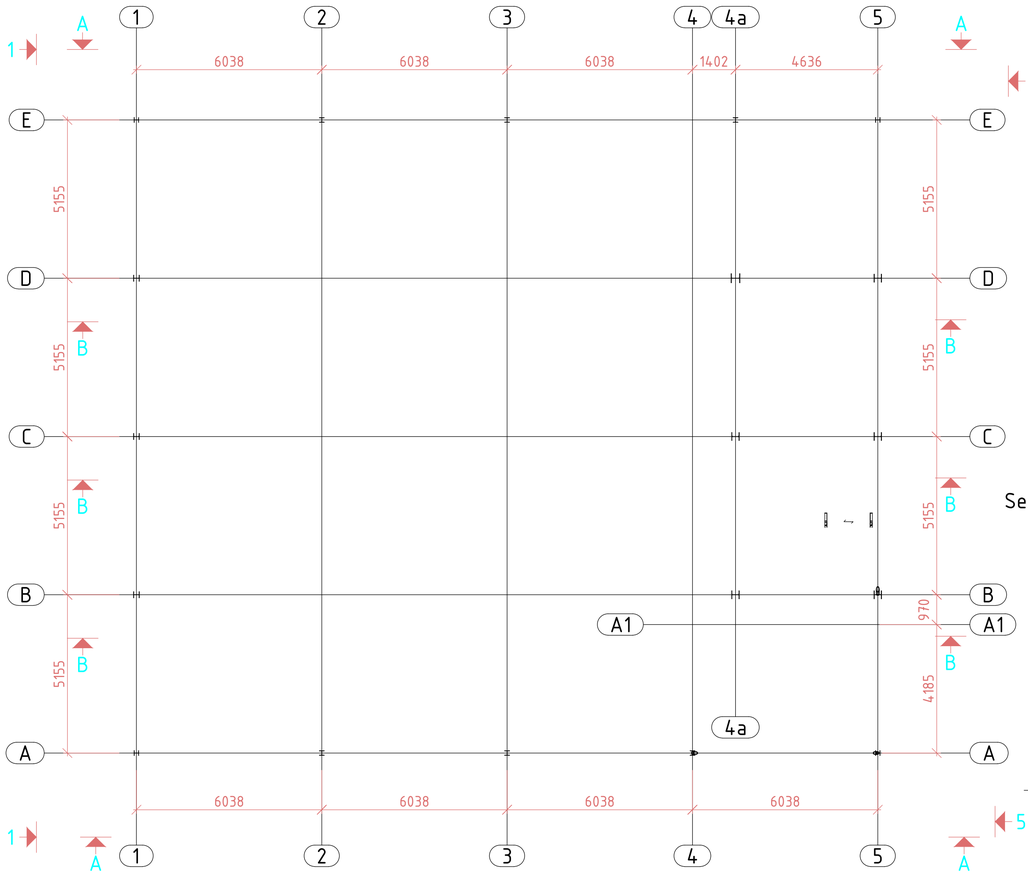
Symbol explanation

$N_{j,Rd}$	Tension (compression) resistance
S_t	Secant axial stiffness
δ	Logitundial deformation

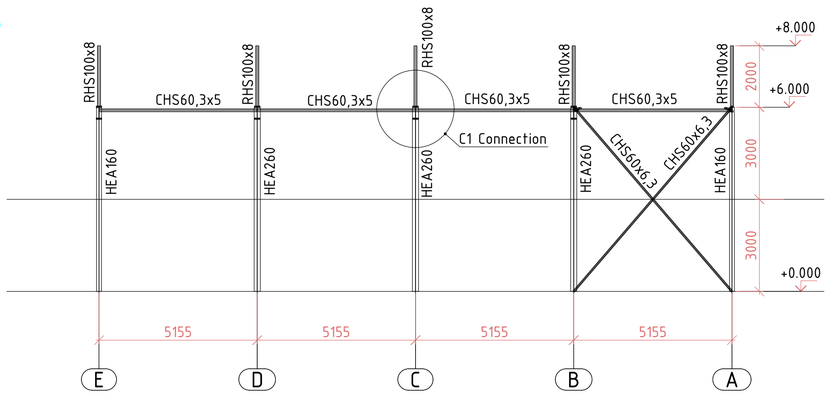
APPENDIX F

Technical Drawings

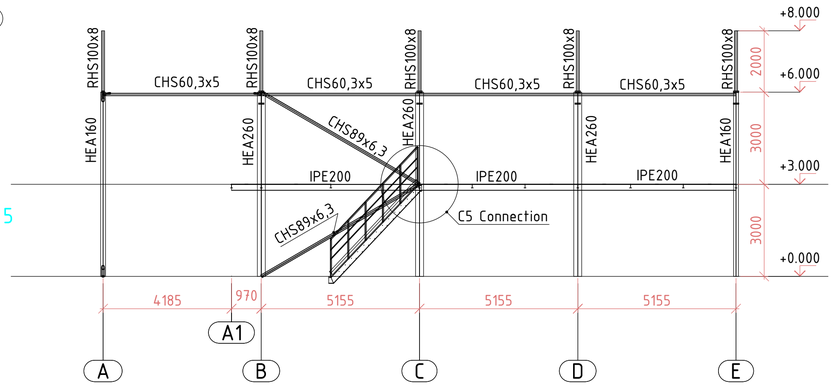
LAYOUT +0.000 1:100



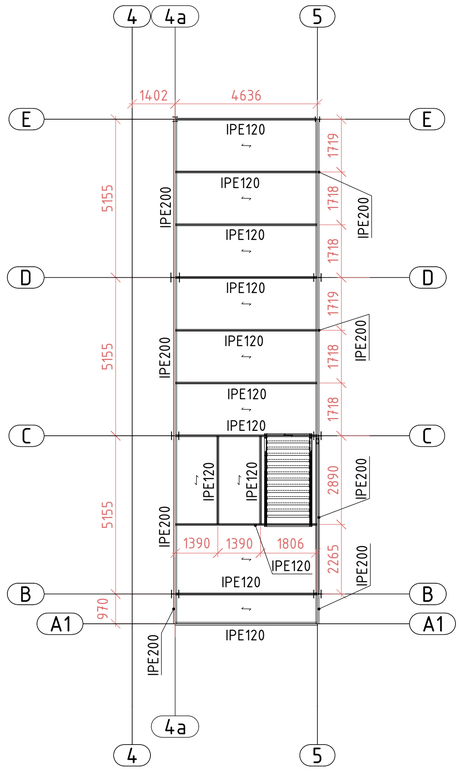
Section 1 - 1 1:100



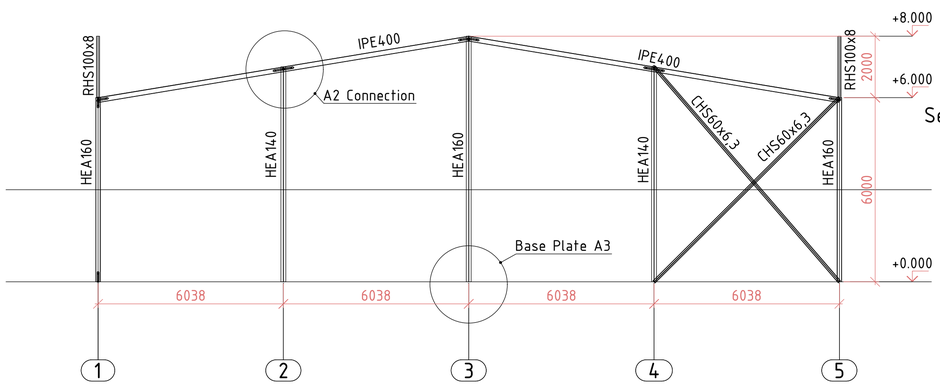
Section 5 -5 1:100



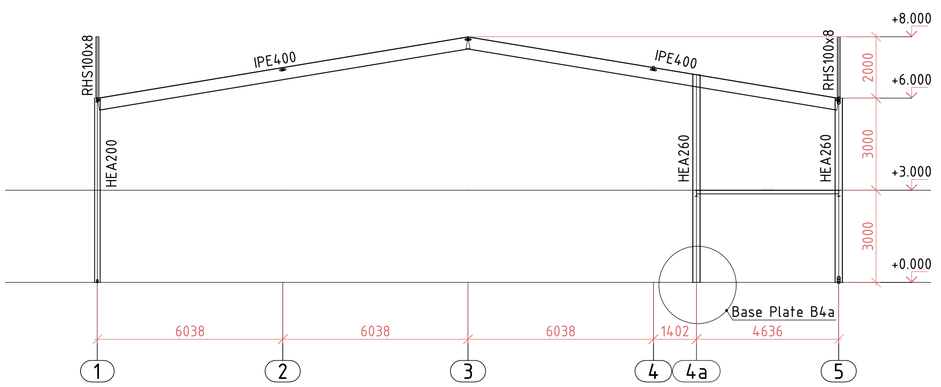
LAYOUT +3.000 1:100



Section A - A 1:100



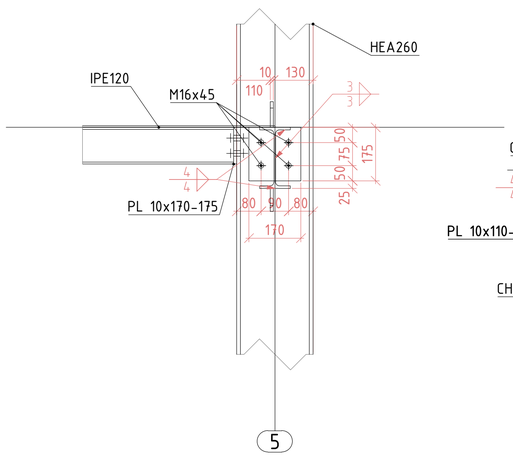
Section B - B 1:100



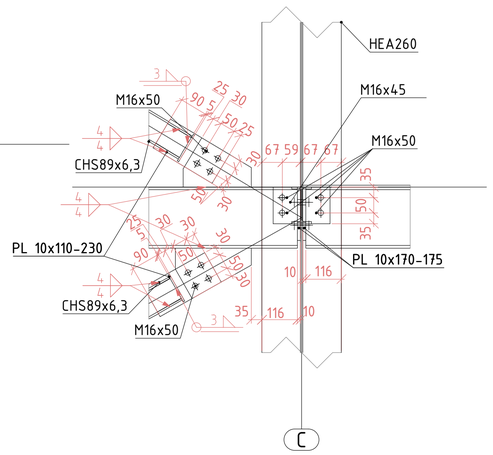
STEEL	S355J2 S320 GD (trapezodial metal sheet)
CONCRETE	C25/30

FACULTY OF CIVIL ENGINEERING AT CTU DEPARTMENT OF STEEL AND TIMBER STRUCTURES	
STUDENT Bc. OĞUZ DEMİRBAŞ	SUPERVISOR doc. Ing. MICHAL JANDERA, Ph.D
TOPIC OF THE MASTER PROJECT ŠKODA SHOWROOM	DATE Jan 2022
TITLE OF APPENDIX LAYOUTS AND SECTIONS	SCALE 1:100 NUMBER 01

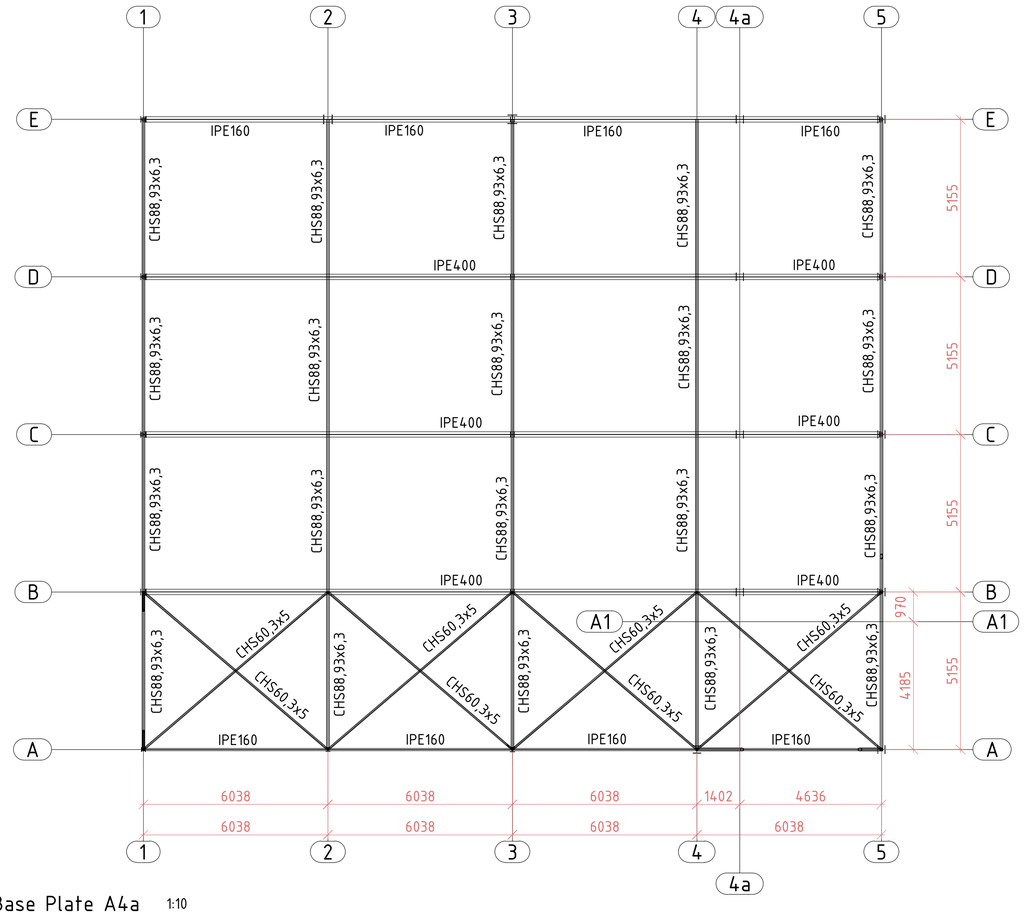
C5 - Connection 1:10



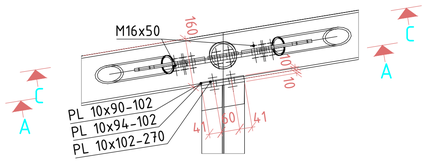
C5 - Connection 1:10



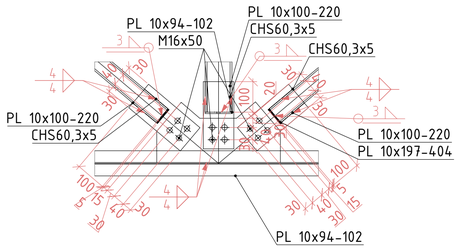
LAYOUT +8.000 1:100



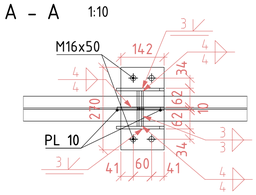
A2 Connection 1:10



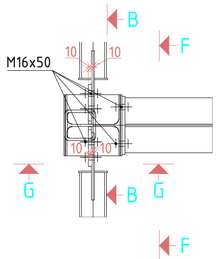
C - C 1:10



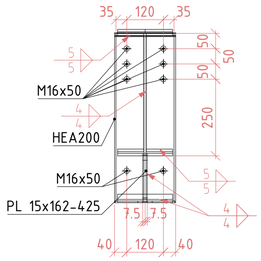
A - A 1:10



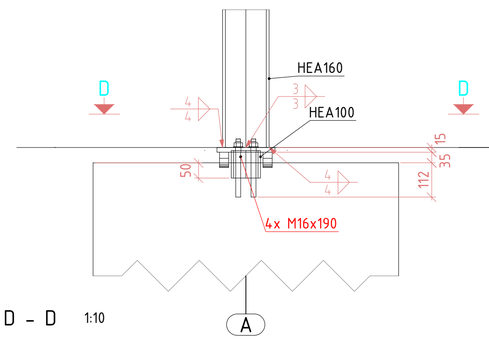
C1 Connetion Layout 1:10



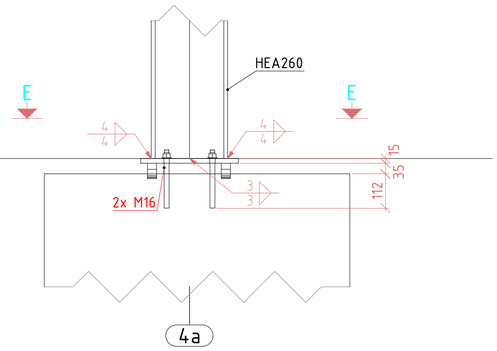
F - F 1:10



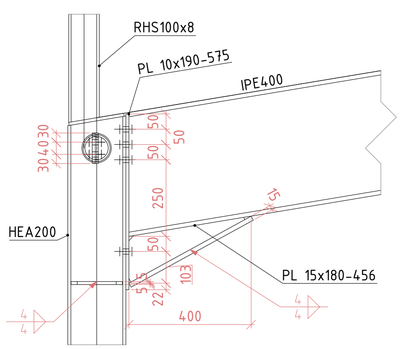
Base Plate A3 1:10



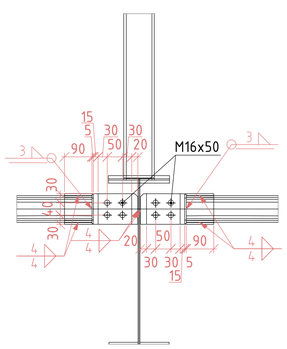
Base Plate A4a 1:10



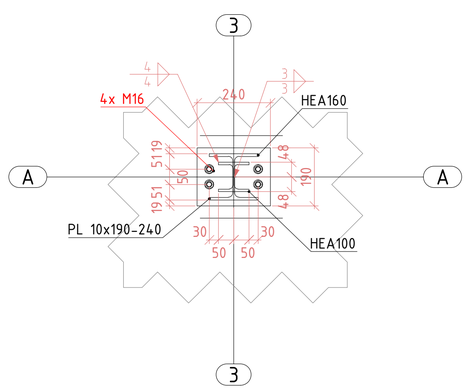
G - G 1:10



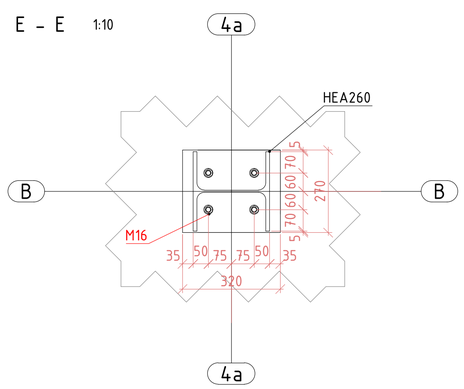
B - B 1:10



D - D 1:10



E - E 1:10



STEEL S355J2
S320 GD (trapezodial metal sheet)
CONCRETE C25/30

FACULTY OF CIVIL ENGINEERING AT CTU DEPARTMENT OF STEEL AND TIMBER STRUCTURES	
STUDENT Bc. OĞUZ DEMİRBAŞ	SUPERVISOR doc. Ing. MICHAL JANDERA, Ph.D
TOPIC OF THE MASTER PROJECT ŠKODA SHOWROOM	DATE Jan 2022
TITLE OF APPENDIX CONNECTION DETAILS AND ROOF LAYOUT	SCALE 1:10 1:100 NUMBER 02