

EASY NPS®

User Manual



Tecnostrutture s.r.l.

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INSTALLATION IN 3 STEPS

- 1) Visit www.tecnostrutture.eu/eng and select the Predesign Software from the "Design tools" section.
- 2) Log in for free to download the Easy NPS® software. Enter your credentials. Not registered yet? Sign in.
- 3) Download the Easy NPS® software for free.

USE

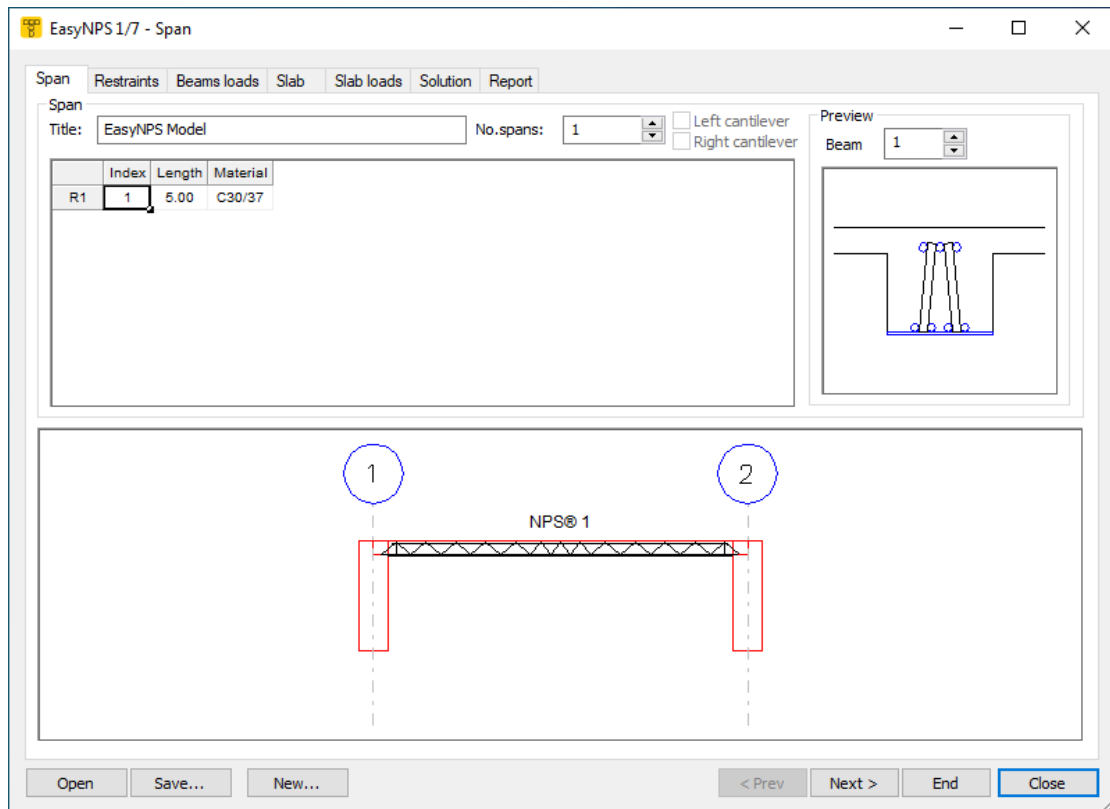
**FROM DATA
INPUT TO
RESULT**

ENTERING THE INPUT DATA

ENTER THE DIMENSION OF THE BEAMS

Select the number of spans and any cantilevers on the right or left.

Enter the length of the beam and the concrete class to be used for the top-casting.

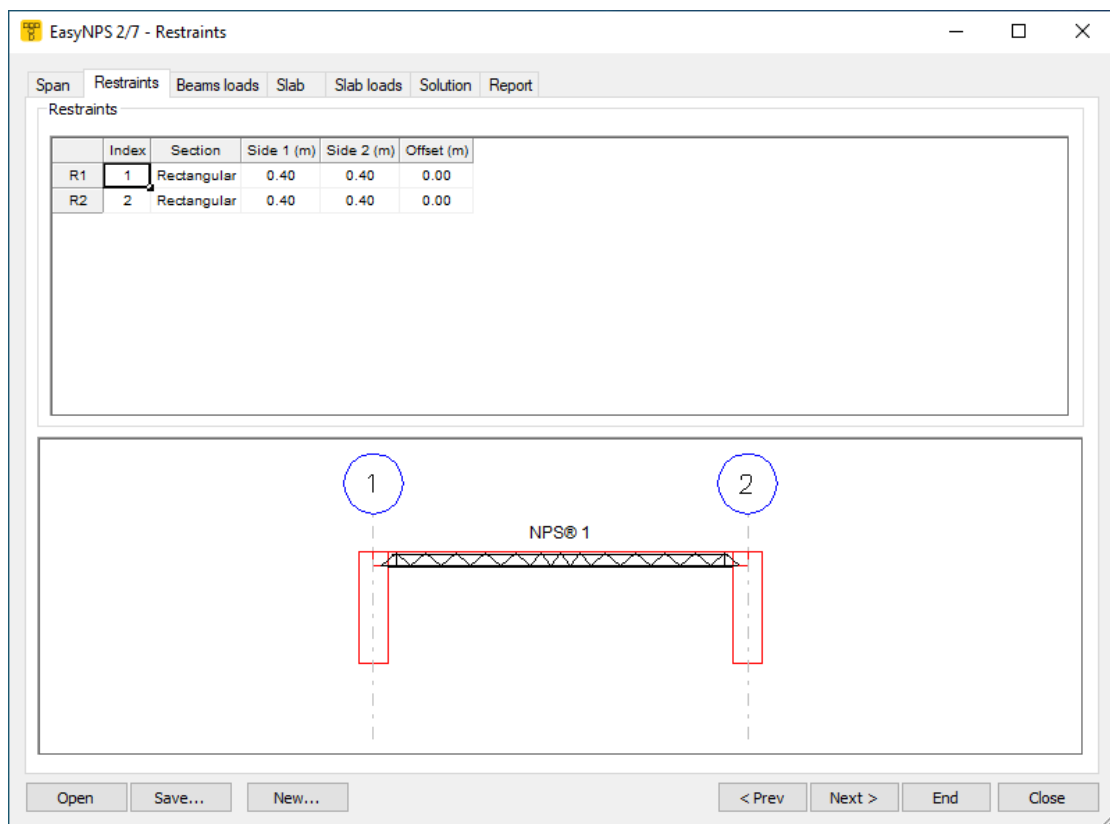


ENTER THE TYPE OF SUPPORTS

Select the type of supports (Restrains) from the options: Rectangular, circular, or cantilever.

Enter the size in meters (m) for each support.

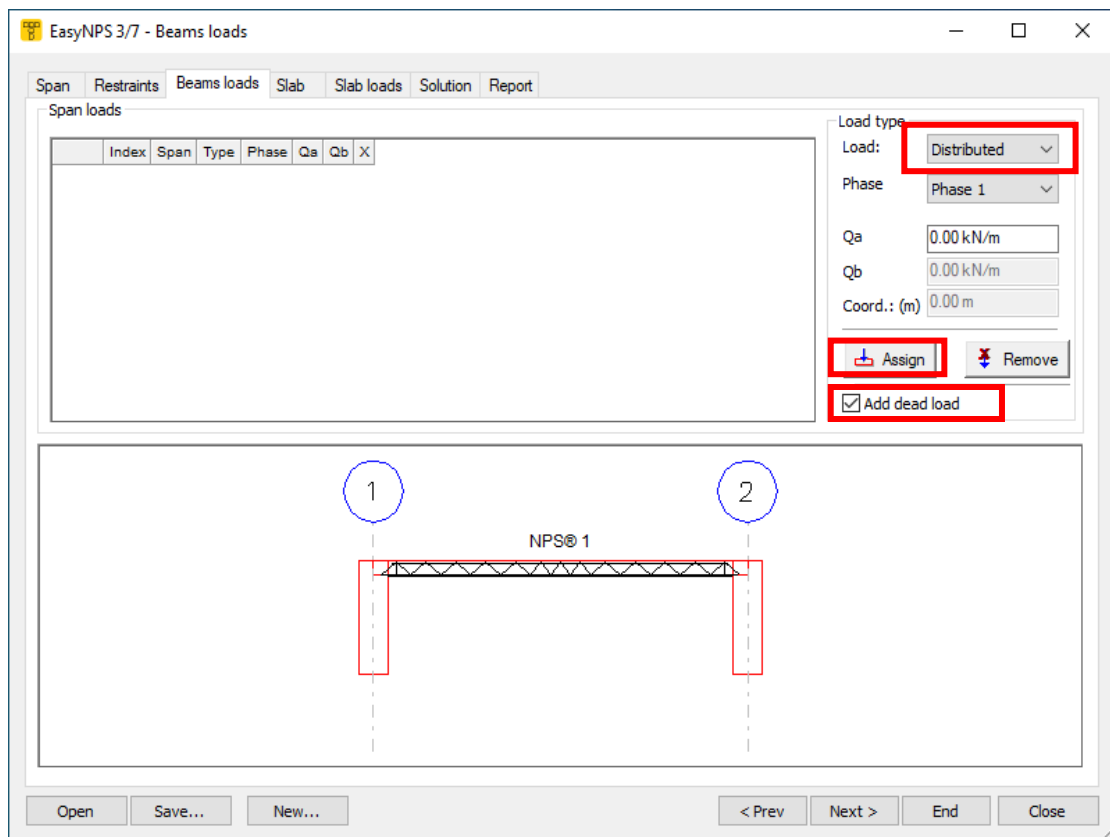
It is possible to assign an offset to the right or left of the axis of the support (column or wall).



ENTER THE LOADS ON THE BEAMS

Select the loads acting on the beams, choosing between distributed loads, trapezoidal, point force or point moment. Then click on "Assign" and on the span of the drawing to assign the value.

By leaving the "Add Dead Load" box selected, the program automatically calculates the weight of the beam.



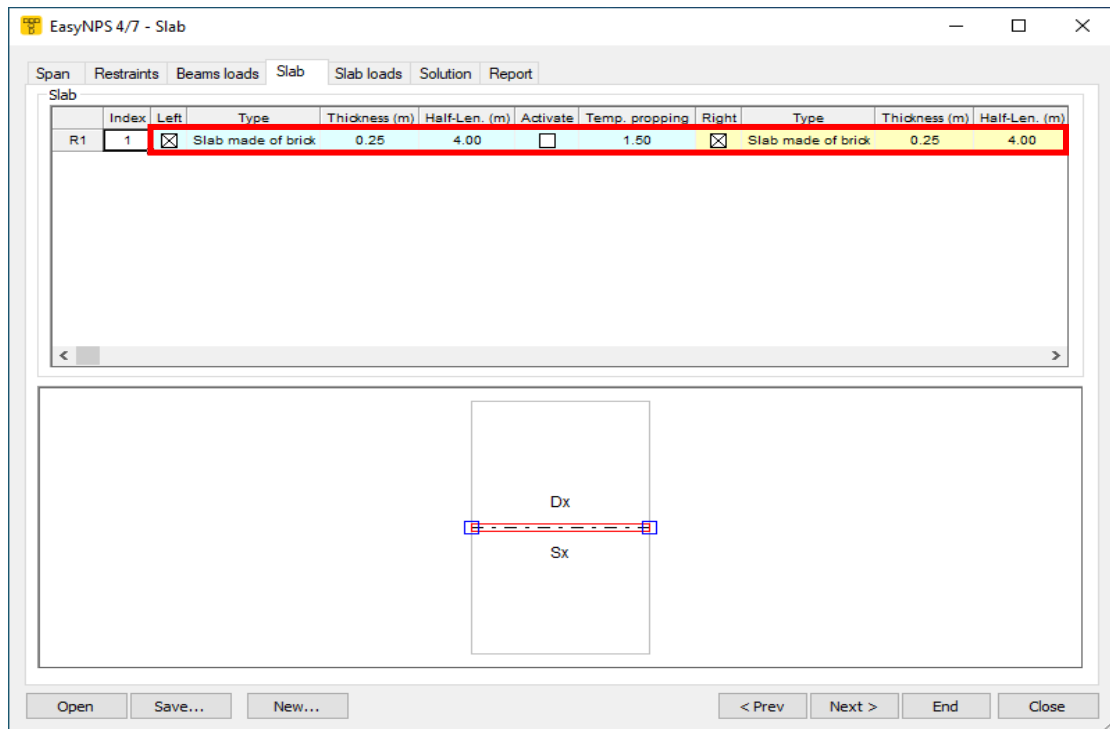
ENTER THE TYPE OF SLABS

Select the type of slab from the options in the drop-down menu:

- Slab made of brick
- Slab
- Filigree slab
- Hollow core slab
- Airpop
- Profiled steel decking

Enter the thickness and the area of influence of the floor (Half-Len), expressed in meters (m).

Select "Activate" to insert the props for floors that require to be supported and "Temp. propping" to specify the distance in meters (m).



ENTER LOADS ON THE SLAB

Enter the values of the loads acting on the slab, distinguishing between those of the 1st phase (construction phase until the concrete casting has not reached the design strength) and of the 2nd phase (final phase, when steel and concrete work together). Specify Death Loads and Live Loads.

	Beam	Slab	Phase 1 kN/m ²	Phase 2 (D.L.) kN/m ²	Phase 2 (L.L.) kN/m ²
R1	Beam 1	Left slab	0.00	0.00	0.00
R2		Right slab	0.00	0.00	0.00

The diagram below the table shows a vertical rectangle representing a slab. A horizontal dashed line is labeled 'Dx' and a solid line is labeled 'Sx'.

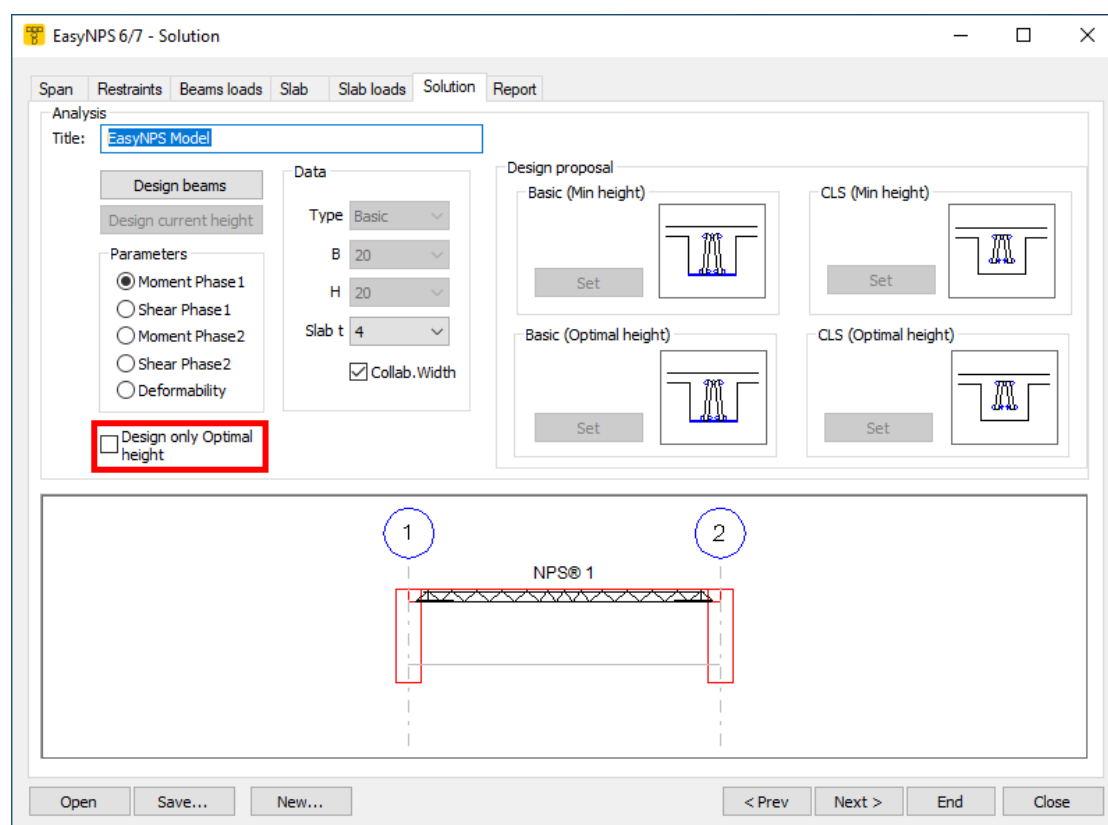
CALCULATE THE SECTION

TWO WAYS

It is possible to choose whether to calculate the section manually (by changing the parameters suggested by the program) or directly by obtaining the section with optimal height.

If you choose to proceed with the calculation of the beam with optimal height, select the "Design only optimal height" option, click on "Design Beams" and go to the "DIAGRAM AND EXPORT" section.

To calculate the section manually, follow the next steps.



CALCULATE EACH PROPOSED SECTION

Click "Design beams" to calculate the minimum and optimal sections of NPS® Basic and NPS® CLS beams proposed by EASY NPS®. This calculation can take several minutes.

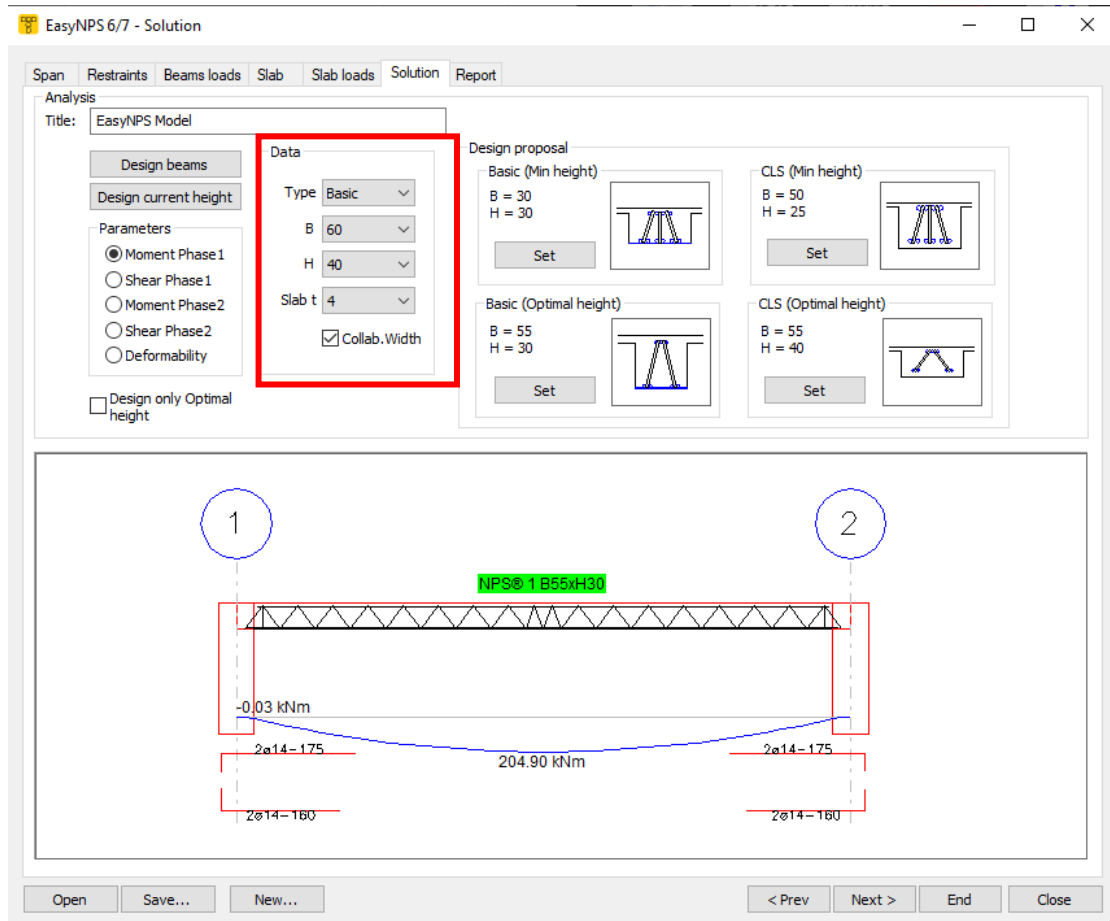
Select the type of section proposed with the "Set" button.

The screenshot displays the 'EasyNPS 6/7 - Solution' software interface. The 'Solution' tab is active, showing the 'Design beams' section. The 'Analysis' title is 'EasyNPS Model'. The 'Design current height' is set to 'Basic'. The 'Parameters' section includes 'Moment Phase1' (selected), 'Shear Phase1', 'Moment Phase2', 'Shear Phase2', and 'Deformability'. The 'Data' section shows 'Type: Basic', 'B: 55', 'H: 30', 'Slab t: 4', and 'Collab. Width' checked. The 'Design proposal' section is highlighted with a red box and contains four options: 'Basic (Min height)' (B=30, H=30), 'CLS (Min height)' (B=50, H=25), 'Basic (Optimal height)' (B=55, H=30), and 'CLS (Optimal height)' (B=55, H=40). Each option has a 'Set' button and a small diagram of the beam cross-section. Below the design proposal is a diagram of a beam between two supports labeled '1' and '2'. The beam is labeled 'NPS® 1 B55xH30'. The diagram shows a bending moment curve with a maximum value of 204.90 kNm and a minimum value of -0.03 kNm. The beam is supported by '2ø14-175' columns and has a slab thickness of '2ø14-160'.

MODIFY THE PARAMETERS

To manually change the parameters of the proposed sections, fill in the boxes inside the "Data" box.

If, on the other hand, the "Design proposal" section meets the requirements, go to the "Parameters" verification diagram.



VERIFY THE MODIFIED SECTION

Click "Design current height" to check the section of the span with the modified parameters of the "Data" box.

The screenshot displays the 'EasyNPS 6/7 - Solution' software interface. The 'Analysis' tab is active, showing the title 'EasyNPS Model'. The 'Design beams' section has 'Design current height' highlighted with a red box. The 'Data' section includes the following parameters:

- Type: Basic
- B: 60
- H: 40
- Slab t: 4
- Collab. Width:

The 'Design proposal' section shows four options:

- Basic (Min height): B = 30, H = 30
- CLS (Min height): B = 50, H = 25
- Basic (Optimal height): B = 55, H = 30
- CLS (Optimal height): B = 55, H = 40

The main diagram shows a beam section between two supports labeled 1 and 2. The beam is labeled 'NPS® 1 B60xH40'. The diagram includes a moment diagram with values: -0.03 kNm at the left support, 215.83 kNm at the center, and -0.03 kNm at the right support. Reinforcement details are shown as 2ø14-185 at the top and 2ø18-185 at the bottom.

SELECT THE VERIFICATION DIAGRAM

Select the type of diagram you want to check for the pre-dimensioning of the span:

- Moment Phase 1 (construction phase)
- Shear Phase 1 (construction phase)
- Moment Phase 2 (final phase)
- Shear Phase 2 (final phase)
- Deformability

The screenshot displays the 'EasyNPS 6/7 - Solution' software interface. The 'Analysis' tab is active, showing the title 'EasyNPS Model'. The 'Design beams' section is highlighted, with 'Design current height' selected. The 'Parameters' section is highlighted with a red box, showing the following options:

- Moment Phase 1
- Shear Phase 1
- Moment Phase 2
- Shear Phase 2
- Deformability

The 'Data' section shows the following parameters:

- Type: Basic
- B: 60
- H: 40
- Slab t: 4
- Collab.Width

The 'Design proposal' section shows four options:

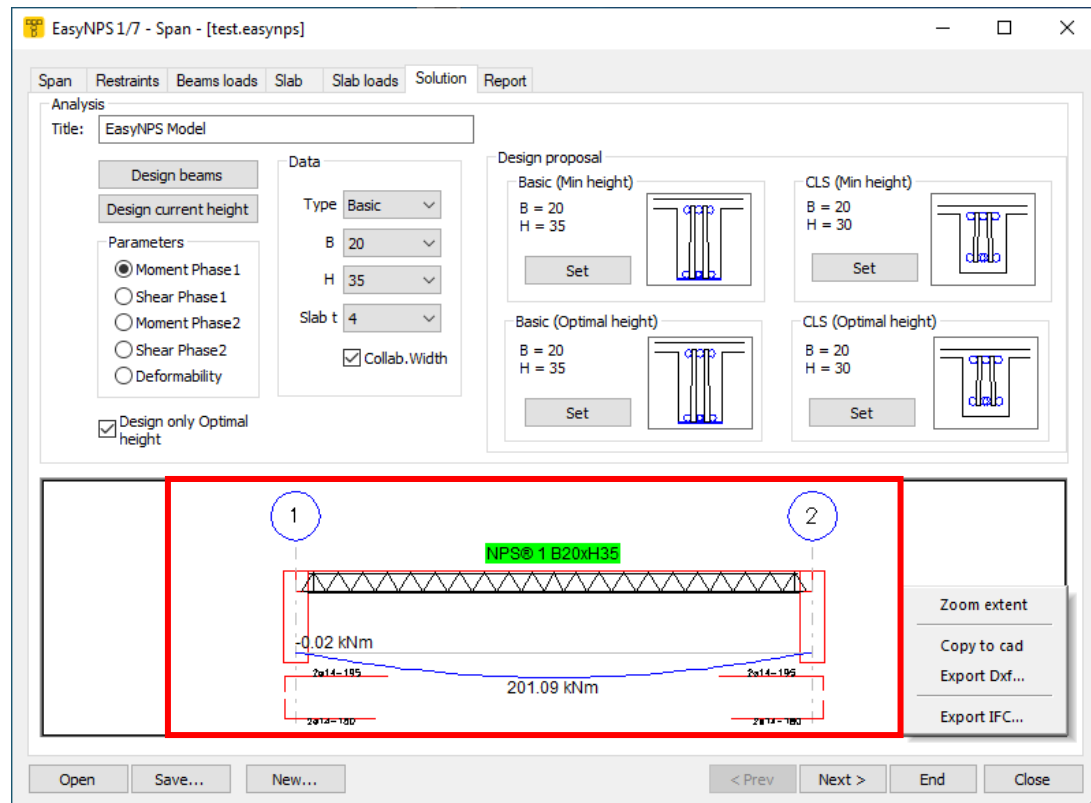
- Basic (Min height): B = 30, H = 30
- CLS (Min height): B = 50, H = 25
- Basic (Optimal height): B = 55, H = 30
- CLS (Optimal height): B = 55, H = 40

The main diagram shows a beam labeled 'NPSØ 1 B60xH40' between two supports (1 and 2). The beam is supported by 2Ø14-185 at the top and 2Ø18-185 at the bottom. The diagram shows a moment diagram with a maximum moment of 215.83 kNm and a minimum moment of -0.03 kNm. The span length is 215.83 m.

DIAGRAM AND EXPORT

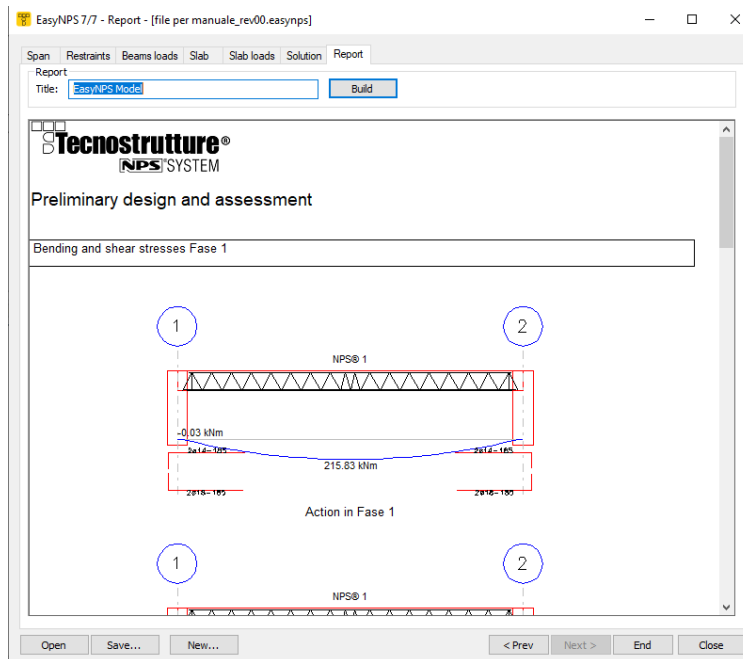
It is possible to view the type of diagram selected and export:

- the section in .dxf format
- The .ifc model to be displayed in BIM.



VIEW THE REPORT

It is possible to generate a predesign report with the section evaluation. Among the data shown there is the equivalent elastic modulus. The file is exportable in .rtf format.



Input Data			
Beam no. 1			
Concrete (concrete strength class)		: C30/37	Product type : NPS®
Basic			
Length	: 7.00 m	Modulus of elasticity eq (*)	: 89689 MPa
Med [left] (moment)	: 12.37 kNm	Material	: S355
Med [middle]	: 580.94 kNm	Ved [left] (shear)	: 319.86 kN
Med [right]	: 12.37 kNm	Ved [right] (shear)	: 319.86 kN
TS [left] (type of slab)	: Bausta	SS [left] Slab thickness	: 25 cm
TS [right] (type of slab)	: Bausta	SS [right] Slab thickness	: 25 cm
H (Beam height)	: 40 cm	B (beam basis)	: 60 cm
Hs (Additional casting height)	: 4 cm	Bs (Additional casting width)	: 160 cm
Mpl,Rd+	: 679.44 kNm	Mpl,Rd-	: -272.01 kNm
V,Rd	: 339.18 kN	MRd,Phase1	: 241.91 cm
Proposed typology → 03819B60x40			

Do you have any questions? Write to tech@tecnostrutture.eu