



# module CONCRETE



## ANCHORS – module Concrete

General Information:

Data Input:

Model 3D:

Results:

1. General Information
2. General - data input area
3. Substrate
4. Fixture
5. Anchors
6. Loads
7. Model 3D
8. Design method, anchors filter
9. Calculate all anchors
10. Result for selected anchor
11. InInstallation data
12. Report printout



– Move on to a topic of your choice



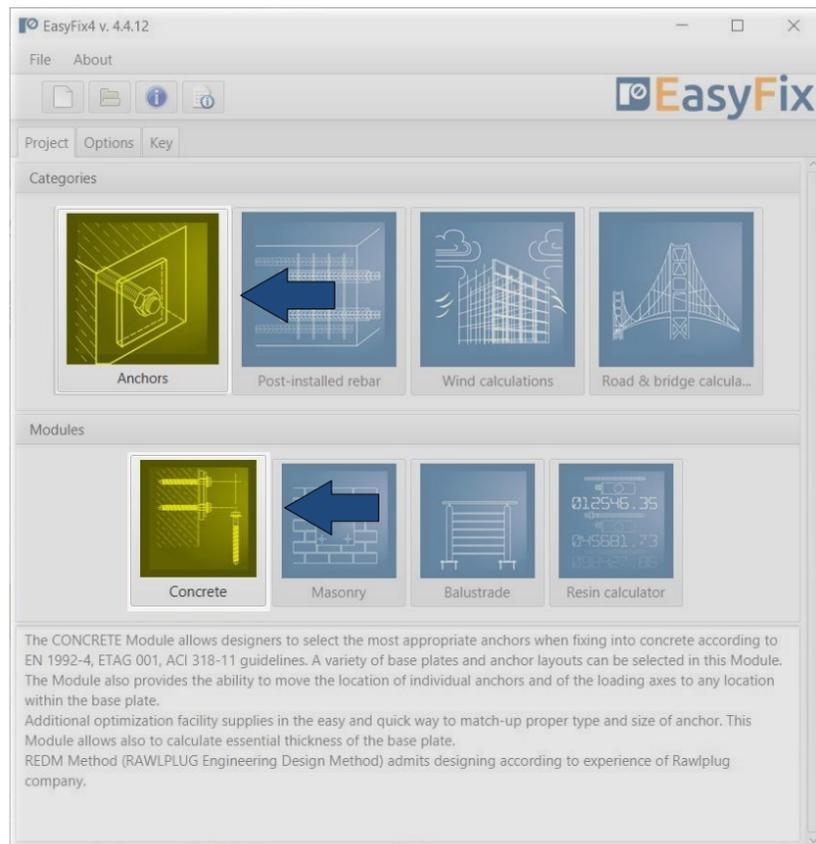
– Back to table of contents



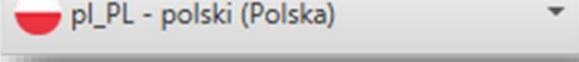
# ANCHORS – module Concrete

## 1 General information

Select a category and module :



Designation of icons and symbols :

-  Create a new project
-  Open project
-  Save | Save as project
-  Undo | Redo changes
-  Generate printout to pdf file
-  Program information
-  pl\_PL - polski (Polska)

Create a new project

Open project

Save | Save as project

Undo | Redo changes

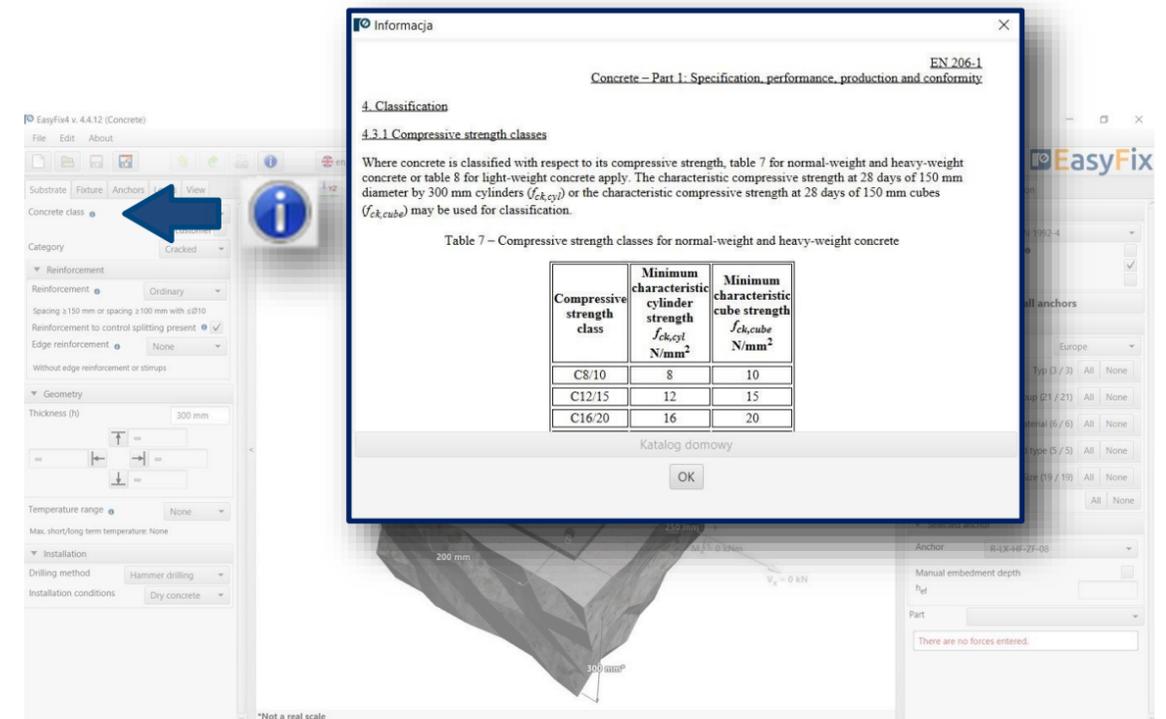
Generate printout to pdf file

Program information

Selecting the program language

Information icons

User Manual



# ANCHORS – module Concrete

2

Introduction  
Basic window of the concrete module

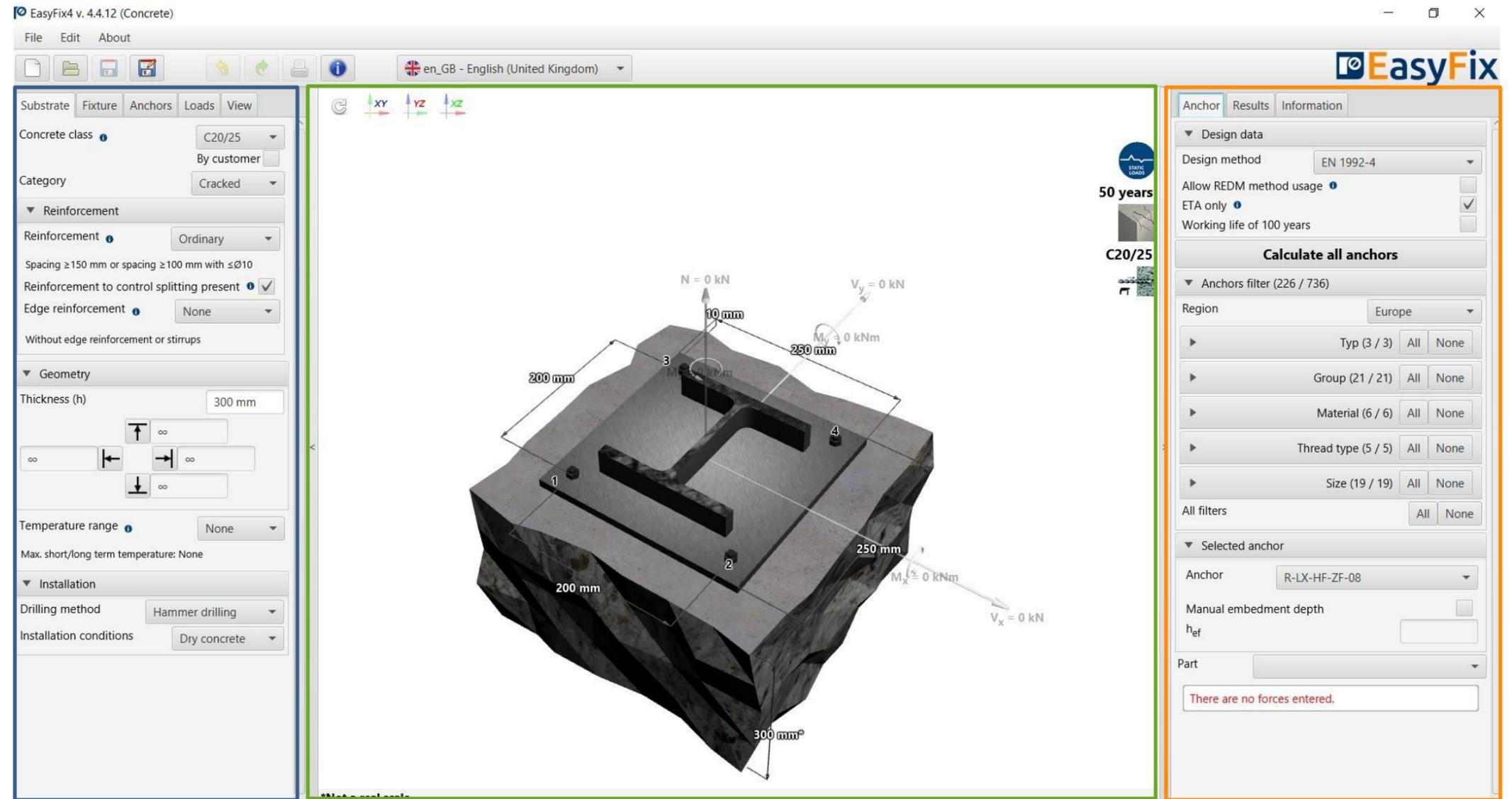
It is separated into three areas:

- data entry
- model view
- results with filters

Input area  
Substrate  
Base  
Anchors  
Loads  
View

Model view  
3D view with rotation and zoom in/out

Result area  
Anchor - Filter products  
Results - for a selected product  
Product information



# ANCHORS – module Concrete

## 3 Substrate tab Data input area

Determine concrete class (also by user and select cracked/un-cracked concrete

Definition of reinforcement or lack thereof in the structure

Definition of dimensions and edges of concrete

Definition of the temperature range and the installation method and conditions determines the filtering range of the anchors

The screenshot displays the 'EasyFix4 v. 4.4.12 (Concrete)' software interface. The 'Substrate' tab is active, showing several input sections:

- Concrete class:** A dropdown menu is open, listing classes from C12/15 to C50/60. 'C20/25' is selected.
- Category:** A dropdown menu is set to 'Cracked'.
- Reinforcement:** A dropdown menu is set to 'Ordinary'. Below it, there are checkboxes for 'Spacing ≥ 150 mm or spacing ≥ 100 mm with ≤ Ø10' (checked), 'Reinforcement to control splitting present' (checked), and 'Edge reinforcement' (set to 'None').
- Geometry:** The 'Thickness (h)' is set to '300 mm'. There are also input fields for width and depth, with '200 mm' and '300 mm' visible.
- Temperature range:** A dropdown menu is set to 'None'.
- Installation:** The 'Drilling method' is set to 'Hammer drilling' and 'Installation conditions' is set to 'Dry concrete'.

Arrows indicate the flow of data from these input fields to a central 3D model of a concrete substrate. The model shows a rectangular block with dimensions 200 mm x 200 mm x 300 mm. Four anchors are embedded in the top surface, labeled 1, 2, 3, and 4. The model is shown with coordinate axes (x, y, z) and force vectors (V<sub>x</sub>, V<sub>y</sub>, M<sub>x</sub>, M<sub>y</sub>) applied to it. A note at the bottom of the model area states '\*Not a real scale'.

On the right side of the interface, the 'Definition' section shows 'f<sub>ck</sub>' set to '20 MPa' and 'f<sub>ck,cube</sub>' set to 'By customer'. Below this, there are tabs for 'Anchor', 'Results', and 'Information'. The 'Anchor' tab is active, showing 'Design data' (Design method: EN 1992-4), 'Anchors filter (226 / 736)', and 'Selected anchor' (Anchor: R-LX-HF-ZF-08).

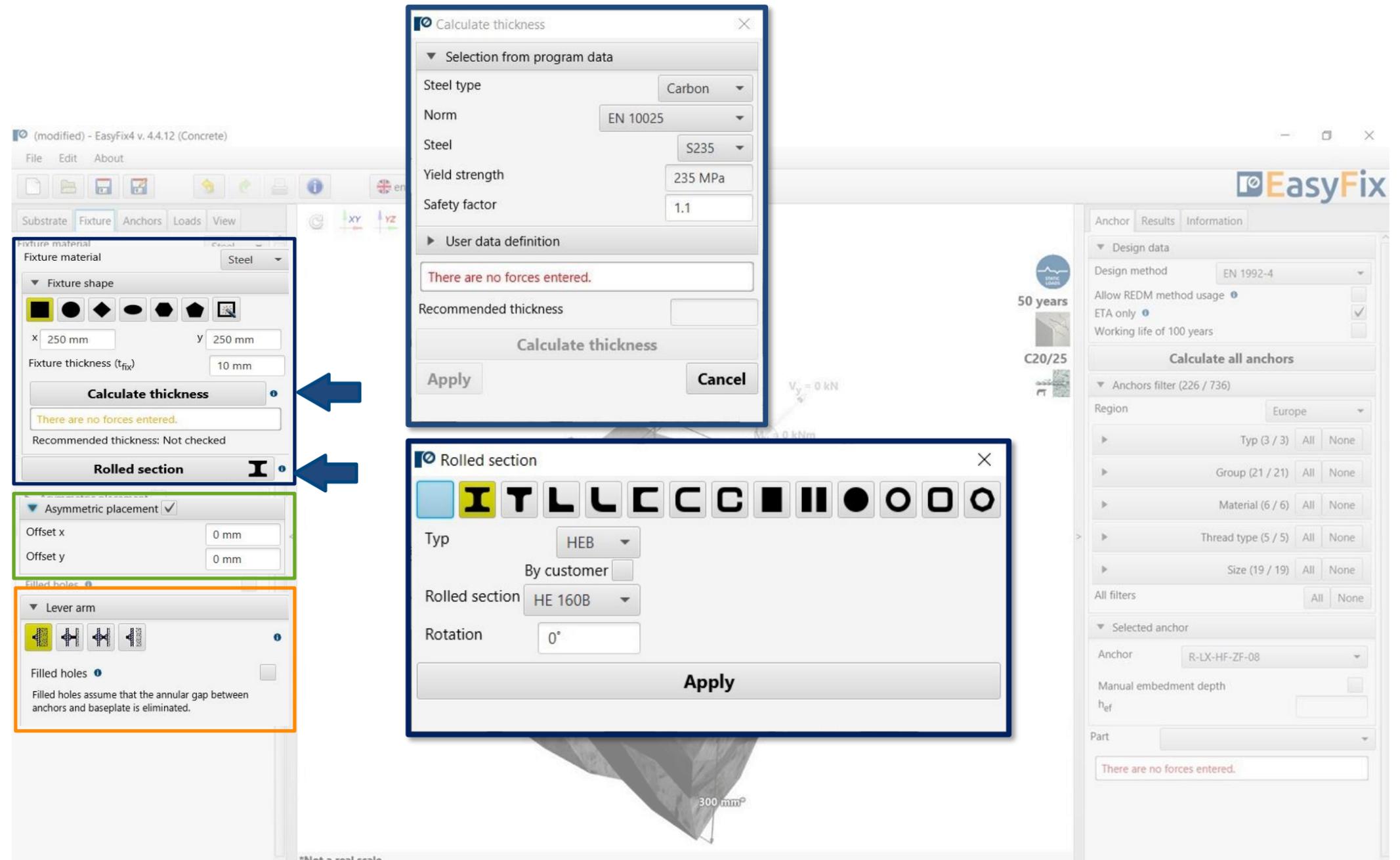
# ANCHORS – module Concrete

## 4 Fixture tab Input area

Specify the **Material** and **Shape** of the fixture from the shape palette and specify the dimensions or according to the customer. Calculate Thickness button opens an auxiliary window for calculating the base plate thickness (calculation possible after introducing the load) Button Shape allows you to select the type and size of the shape, also the own shape according to the user

Choosing an **asymmetrical placement** allows you to shift the force application point relative to the base's center of gravity

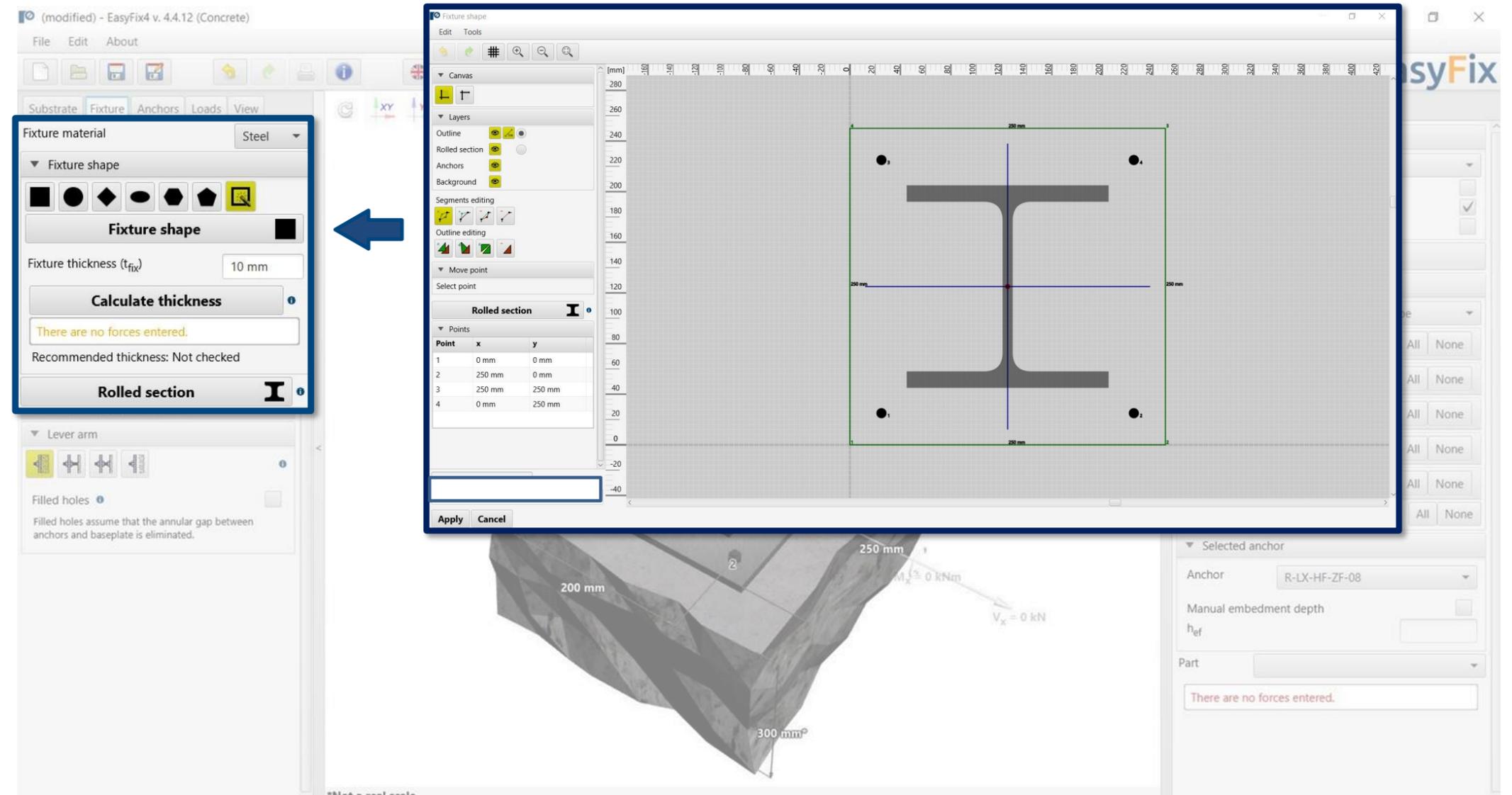
Selecting **Lever arm** allows you to calculate the forces on the arm due to the distance between the base plate and the ground



# ANCHORS – module Concrete

## 4 Fixture tab Input area

Selecting the Any Base Shape icon activates the **Base Shape** button which opens an additional window for drawing any shape. The shape is drawn using the mouse or by entering the coordinates into the auxiliary window



# ANCHORS – module Concrete

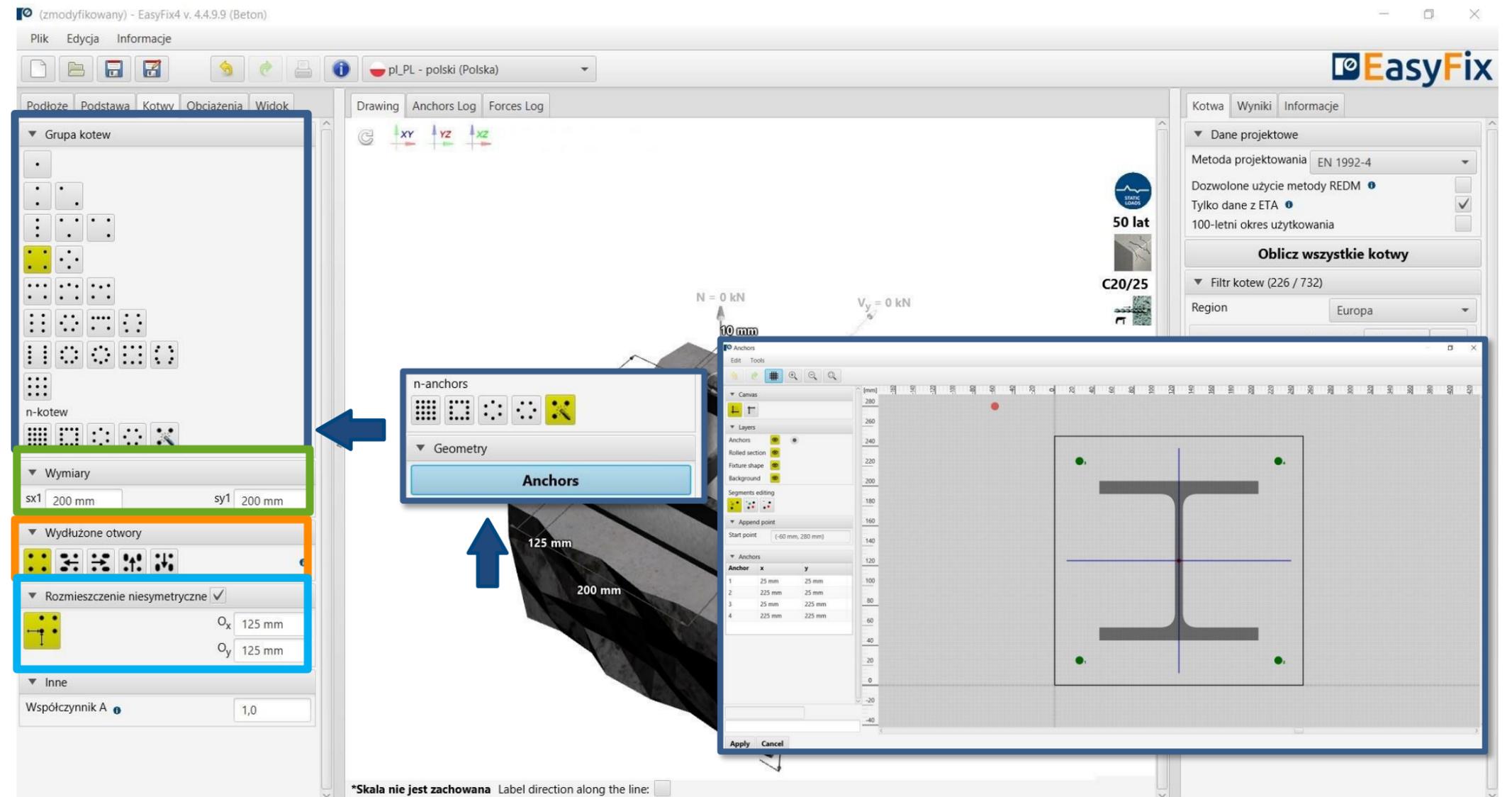
## 5 Anchors tab Input area

Allows selection of anchor layout from pre-defined layouts or by user using from a group of n-anchors

**Dimensions** - distances between anchors can be entered in the tab or directly on the model by clicking on the dimension line.

Declaring elongated "bean" holes changes the distribution of shear forces on the anchors

Determination of the offset of the anchor system from the centre of gravity of the base plate



# ANCHORS – module Concrete

## 6 Loads tab Input area

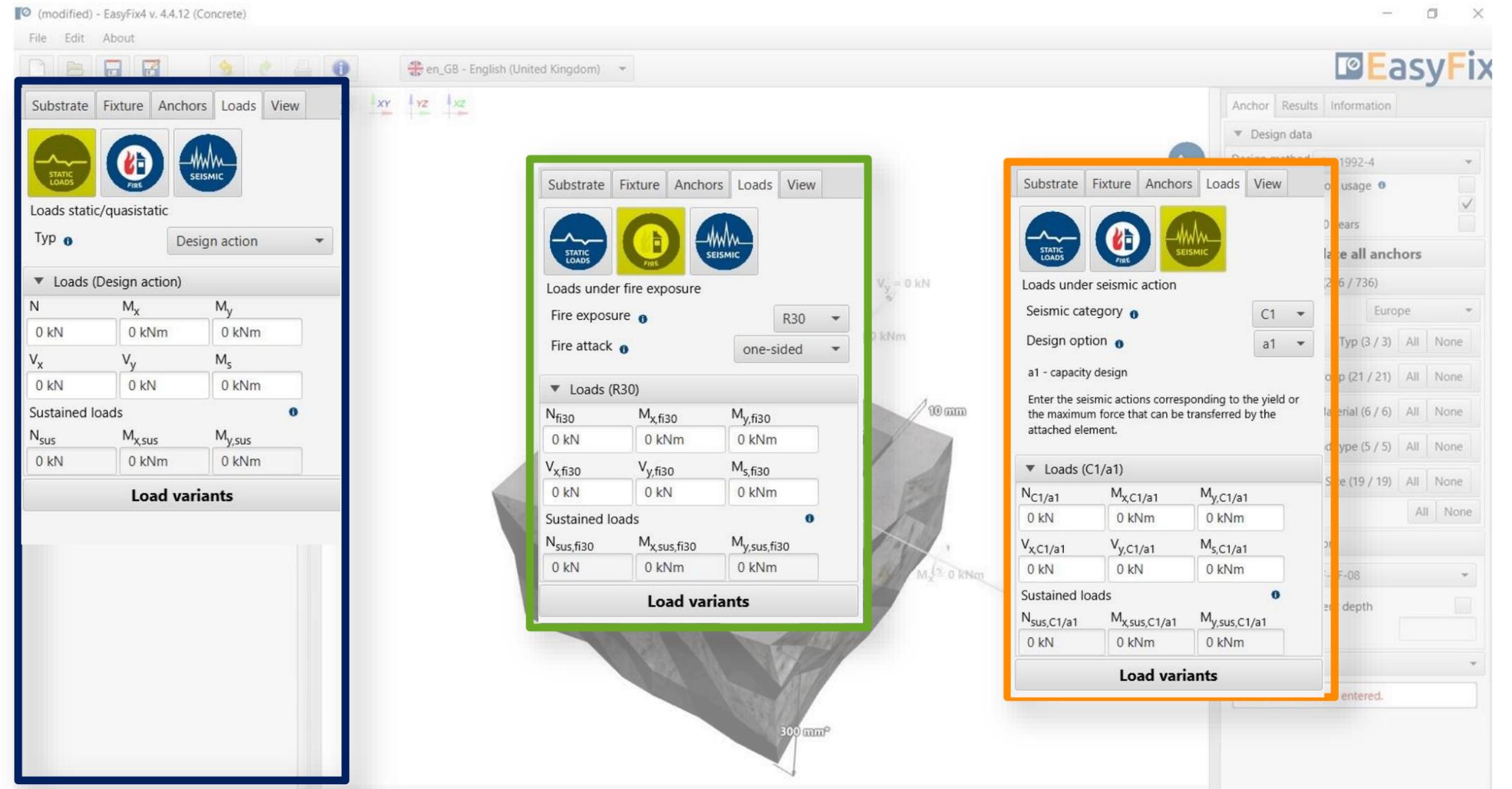
The introduction of fire and seismic loads affects the filtering range of the anchors.

The suffix SUS applies to long-term loads for screw-in anchors according to EN 1992-4

Static loads - calculated or characteristic, with user-defined safety factors

Loads under fire - for different fire resistances

Seismic loads - for seismic resistance C1 and C2



# ANCHORS – module Concrete

## 6 Loads tab Input area

Load Variants - allows you to calculate load variants for a structure. It is possible to import load variants from Robot (csv, xls)

The screenshot displays the EasyFix 4 software interface. The main window shows the 'Loads' tab selected in the top navigation bar. On the left, there are icons for 'STATIC LOADS', 'FIRE', and 'SEISMIC'. Below these, there are input fields for 'Loads static/quasistatic' and 'Loads (Design action)'. A blue arrow points from the 'Load variants' section in the left sidebar to a dialog box titled 'Load variants'.

The 'Load variants' dialog box contains a table with the following data:

Variant	Max.	Loads	N	M <sub>x</sub>	M <sub>y</sub>	V <sub>x</sub>	V <sub>y</sub>	M <sub>z</sub>	N <sub>sus</sub>	M <sub>x,sus</sub>	M <sub>y,sus</sub>	Safety factor	Tension	Shear	Combined	Total
0	✓	Design action	0 kN	0 kNm	0 kNm	0 kN	0 kN	0 kNm	0 kN	0 kNm	0 kNm					⚠
1	✓	Design action	0 kN	0 kNm	0 kNm	0 kN	0 kN	0 kNm	0 kN	0 kNm	0 kNm					⚠
2	✓	Design action	0 kN	0 kNm	0 kNm	0 kN	0 kN	0 kNm	0 kN	0 kNm	0 kNm					⚠

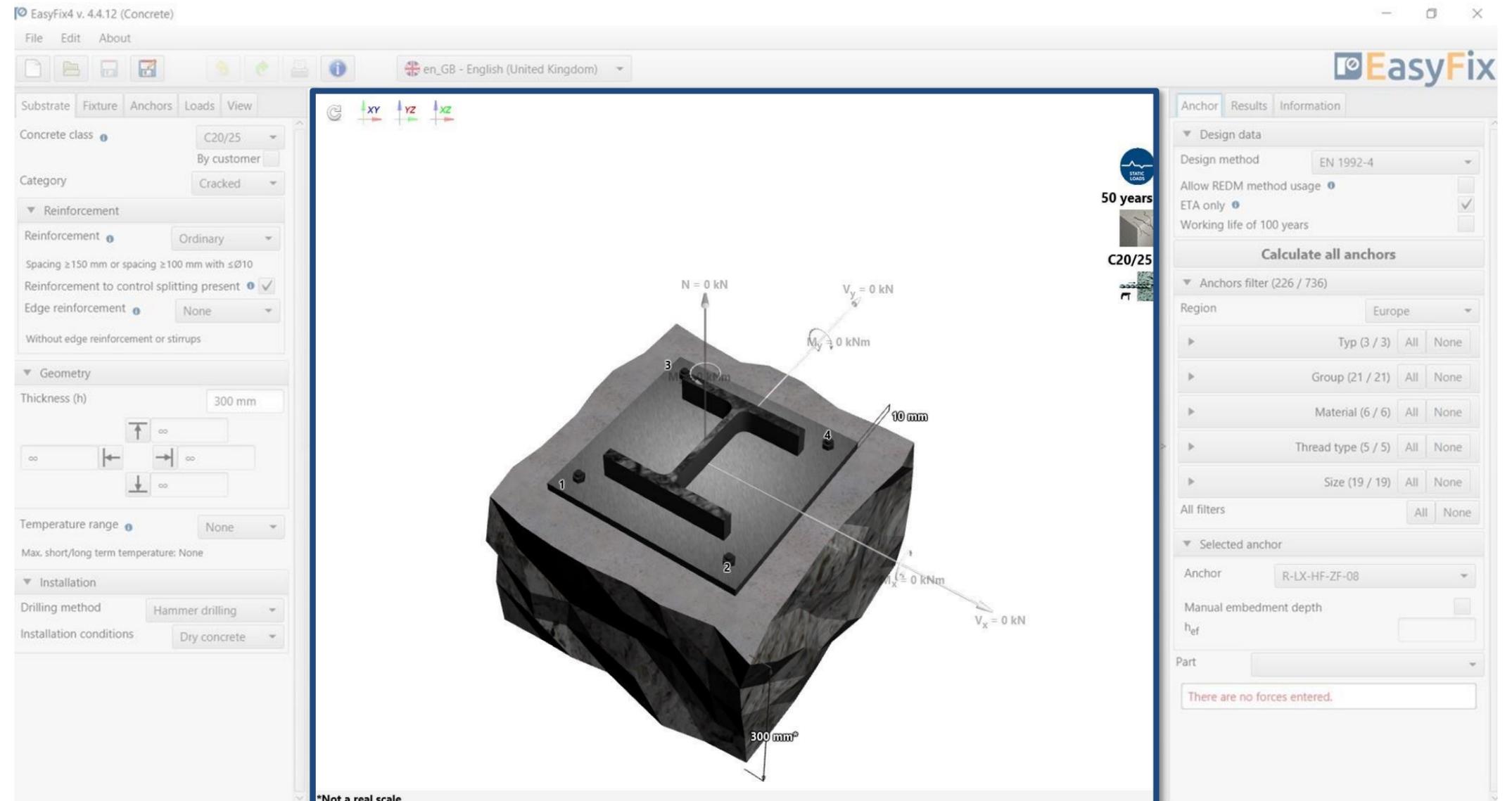
At the bottom of the dialog box, there are buttons for 'Apply', 'Calculate all variants', 'Cancel', and 'Calculate all anchors'. A message box at the bottom right of the main window states 'There are no forces entered.'

# ANCHORS – module Concrete

7

Model tab  
Model view with data input

View - Clicking on a dimension line or force vector allows you to enter data directly into the drawing



# ANCHORS – module Concrete

8 Anchor tab  
Result area

**Design method** - enables selection of the calculation method and the program database.

**Filters** allow selection of anchors by design region, and type and material of construction

**Selected anchors**- makes it possible to specify the choice of anchor, to impose the depth of anchorage

**Utilisation** - summary results window for the selected anchor

**REDM** - Rawlplug Engineering Design Method - is a method which allows for the calculation of anchor systems not covered by EN and ETAG methods.

By checking the box **Only ETA data** it is possible to use test data from Rawlplug

The screenshot displays the EasyFix 4 software interface for concrete anchors. The central 3D model shows a concrete block with four anchors (1, 2, 3, 4) and applied loads. The left sidebar contains configuration panels for Substrate, Reinforcement, Geometry, and Installation. The right sidebar shows the 'Design data' and 'Anchors filter' sections. A 'Design data' dropdown menu is open, listing methods like EN 1992-4, ETAG, and FIB SAG4 06. The 'Anchors filter' section shows filters for Region (Europe), Typ (3/3), Group (21/21), Material (6/6), Thread type (5/5), and Size (19/19). The 'Selected anchor' section shows 'R-LX-HF-ZF-08' with a manual embedment depth of 36 mm. The 'Utilisation' section shows results: Tension (5.4%), Shear (8.4%), and Combined (3.7%).

# ANCHORS – module Concrete

9 Anchor tab  
Result area

Calculate all anchors - calculation of all anchors for a given load

The screenshot displays the EasyFix 4 software interface. A central dialog box titled "Calculate all anchors" is open, showing a table of anchor data. The table has columns for Anchor, Typ, h<sub>ef</sub>, Tension, Shear, Combined, Total, and Apply. The "Apply" column contains checkboxes, with the one for anchor R-LX-HF-ZF-08 checked. To the right of the table is a filter panel for "Anchors filter (226 / 736)" with various criteria like Region, Typ, Group, Material, Thread type, and Size, each with "All" and "None" options. Below the table are "Apply" and "Cancel" buttons. In the background, the main software window shows the "Anchor" tab of the "Results" area, with a "Calculate all anchors" button highlighted in a blue box. The "Selected anchor" section shows details for anchor R-LX-HF-ZF-08, including its manual embedment depth (h<sub>ef</sub> = 36 mm) and utilization values: Tension (5.4%), Shear (8.4%), and Combined (3.7%).

Anchor	Typ	h <sub>ef</sub>	Tension	Shear	Combined	Total	Apply
R-LX-HF-ZF-05	Mechanical	32 mm	10%	8.9%	5.8%	10%	<input type="checkbox"/>
R-LX-HF-ZF-06	Mechanical	32 mm	6.1%	8.8%	4.1%	8.8%	<input type="checkbox"/>
R-LX-HF-ZF-08	Mechanical	36 mm	5.4%	8.4%	3.7%	8.4%	<input checked="" type="checkbox"/>
R-LX-HF-ZF-10	Mechanical	40 mm	4.7%	8.1%	3.3%	8.1%	<input type="checkbox"/>
R-LX-HF-ZF-12	Mechanical	42 mm	5.4%	7.8%	3.5%	7.8%	<input type="checkbox"/>
R-LX-HF-ZF-14	Mechanical	54 mm	2.9%	7.5%	2.6%	7.5%	<input type="checkbox"/>
R-KERII M8-5.8	Bonded	60 mm	2.5%	8.2%	2.8%	8.2%	<input type="checkbox"/>
R-KERII M8-5.8 HDG	Bonded						<input type="checkbox"/>
R-KERII M10-5.8	Bonded	60 mm	2.4%	8%	2.7%	8%	<input type="checkbox"/>
R-KERII M10-5.8 HDG	Bonded	60 mm	2.4%	8%	2.7%	8%	<input type="checkbox"/>
R-KERII M12-5.8	Bonded	60 mm	2.4%	7.8%	2.6%	7.8%	<input type="checkbox"/>
R-KERII M12-5.8 HDG	Bonded						<input type="checkbox"/>

# ANCHORS – module Concrete

## 10 Anchor tab Result area

Resulting forces in anchors - gives values for pull-out and shear forces acting on individual anchors

Tensile loads - percentage strain of the anchor system from tensile forces in individual failure images

Shear loads - percentage stress of the anchor system from shear forces in individual failure images

Combined action - shear and tensile interaction - percentage of steel and concrete stresses

The screenshot shows the EasyFix software interface for concrete anchors. The central 3D model displays a concrete slab with four anchors (1, 2, 3, 4) and applied forces:  $N = 1 \text{ kN}$ ,  $V_y = -1 \text{ kN}$ ,  $M_y = 0 \text{ kNm}$ ,  $V_x = 0 \text{ kN}$ , and  $M_x = 0 \text{ kNm}$ . The dimensions of the slab are 150 mm x 150 mm x 300 mm, with a 10 mm top layer. The results panel on the right provides the following data:

Resulting anchor forces			
No.	$V_x$	$V_y$	N
1	0 kN	-250 N	250 N

Tensile load	
$\beta_{N1}$	0.6%
$\beta_{N2}$	5.4%
$\beta_{N3}$	5.1%
$\beta_{N4}$	ND
$\beta_{N5}$	ND

Shear load	
$\beta_{V1}$	1.6%
$\beta_{V2}$	ND
$\beta_{V3}$	5.1%
$\beta_{V4}$	8.4%

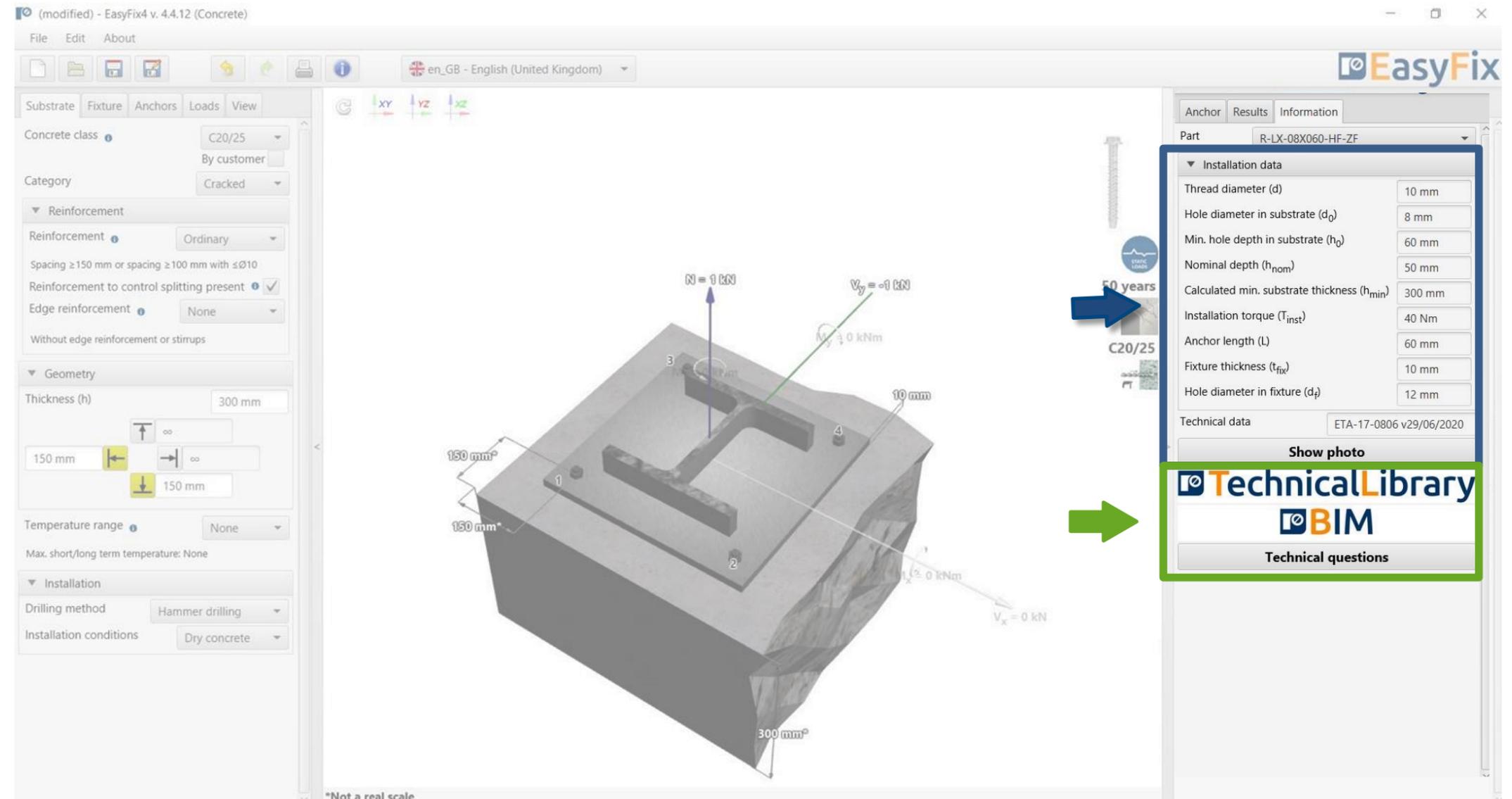
Combined - Tension/Shear	
Steel failure	0.1%
Concrete failure	3.7%

# ANCHORS – module Concrete

11 Anchor tab  
Result area

Installation data - installation parameters for the designed anchor

Links to:  
Technical Library  
BIM Library  
RTH Technical Help



# ANCHORS – module Concrete

## 12

Generation of Printout

Assembly data - parameters  
Print option - enables generation of a document in pdf extension.

The screenshot displays the EasyFix 4 software interface. On the left, the main window shows various configuration panels for concrete anchors, including 'Concrete class' (C20/25), 'Reinforcement' (Ordinary), 'Geometry' (Thickness: 300 mm), and 'Installation' (Hammer drilling). A blue arrow points from the 'Print' icon in the top toolbar to the 'Print' dialog box. The dialog box is open, showing options for 'Print language selection' (en\_GB - English), 'System of measurement' (Metric), and 'Project' information (Name, Subject, Street, City, Code, Notes). A 'Print to file' section at the bottom of the dialog shows the path 'C:\Users\t1sznura\AppData\Local\Temp\easyfix20211021140921.pdf' and a 'Print the document' button. On the right side of the main window, a 'Results' panel is visible, listing technical parameters such as 'R-LX-08X060-HF-ZF', 'd<sub>p</sub> = 10 mm', 'd<sub>0</sub> = 8 mm', 'h<sub>0</sub> = 60 mm', 'h<sub>nom</sub> = 50 mm', 'h<sub>min</sub> = 300 mm', 'T<sub>inst</sub> = 40 Nm', 'L = 60 mm', 't<sub>fix</sub> = 10 mm', and 'd<sub>p</sub> = 12 mm'. The EasyFix logo and 'TechnicalLibrary BIM' branding are also present.

