



Module:  
Lighting pole

## Road & Bridge calculations – Lighting pole

Designing data:

Data input :

Results :

1. Selection of the product category
2. General data input area
3. Defining of the plate and pole's details
4. Defining of the anchor's layout
5. Defining of the acting load
6. Analysis of the results
7. Generating the printout



- move to a selected issue

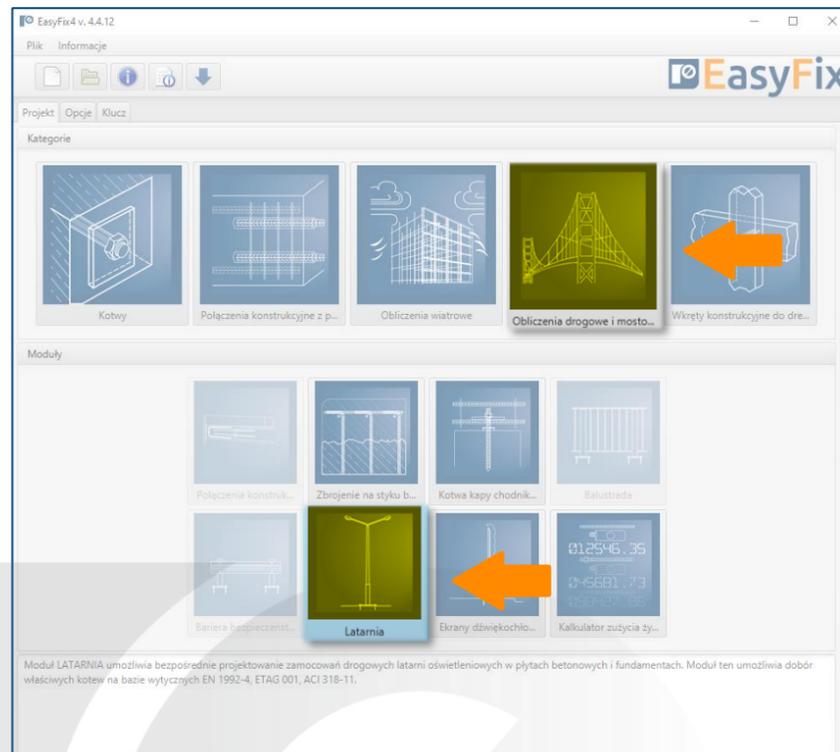


- back to the table of contents

## Road & Bridge calculations – Lighting pole

# 1

Selection of  
The product category



Meaning of icons and symbols:



Create new design



Open file



Safe | Safe as



Undo | Redo changes



Generate pdf printout



Information about software



pl\_PL - polski (Polska)

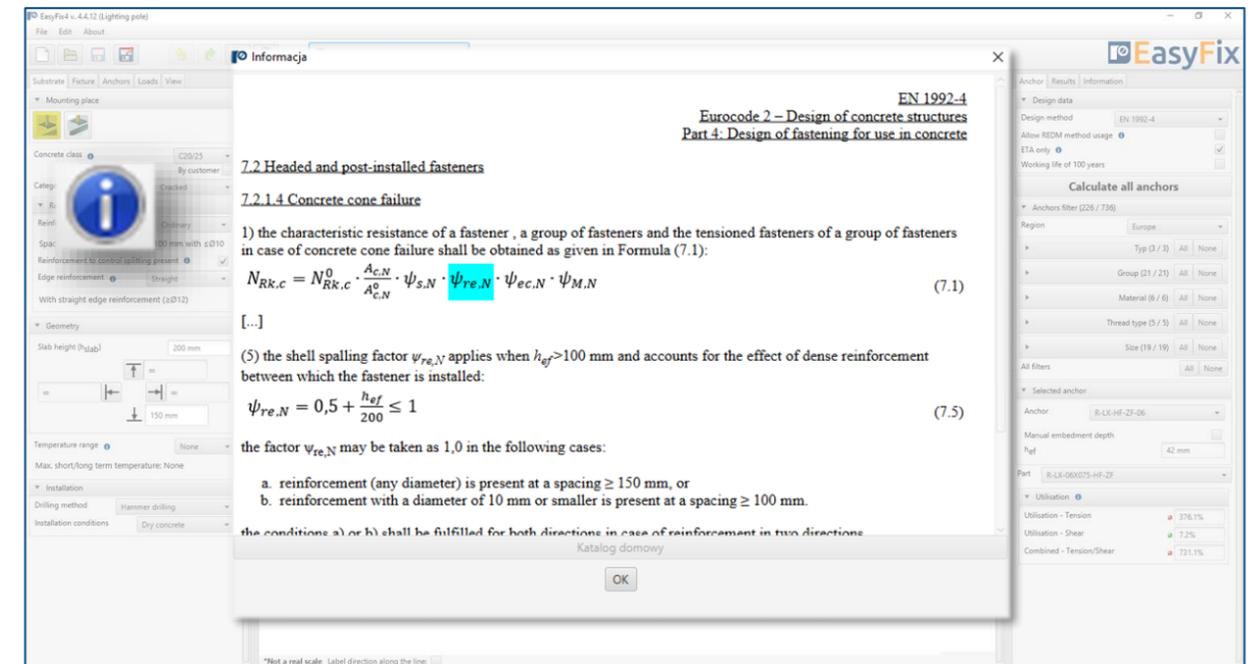
Language selection



Info icons



Instruction manual



Click to information icon to display an additional window containing theory related to a particular issue.



# Road & Bridge calculations – Lighting pole

## 2 General data input area

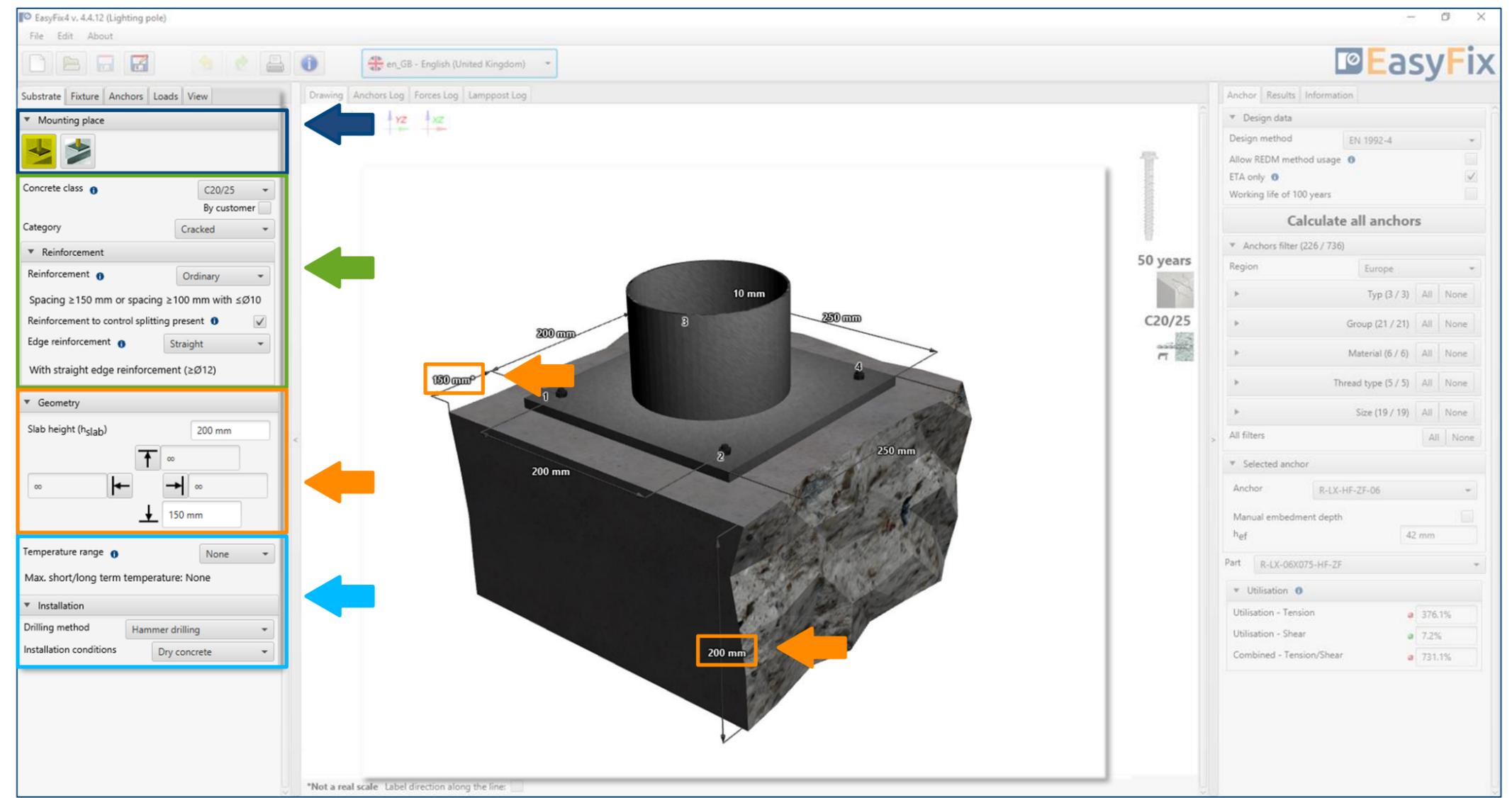
In the **substrate tab**, define the location of the lighting pole and the type of substrate. This requires knowledge of the details of the concrete class and the exact dimensions of the concrete element. The shape of the ground and the positioning of the base in relation to the edge distance is very important for the final results.

Determining the place of installation:  
 - On the plate  
 - On the socle

Determining of the strength class and type of concrete:  
 Entering data by selecting from the list or the option "by user".

Determining of the basic structure dimensions: The geometry of the structure can be specified in the side panel or on the model

Determining of the installation:  
 - Service temperature  
 - Drilling method  
 - Concrete conditions





# Road & Bridge calculations – Lighting pole

## 2 General data input area



Determining of the concrete strength class:

Selecting from the list:  
Concrete strength class according to standard EN 206

Option „by user“:  
Possibility of manual input of characteristic compressive strength of cylinder  $f_{ck}$  or  
Possibility of manual input of characteristic compressive strength of cube  $f_{ck, cube}$ .

Mounting place

Concrete class: C20/25

By customer:

Cracked:

Mounting place

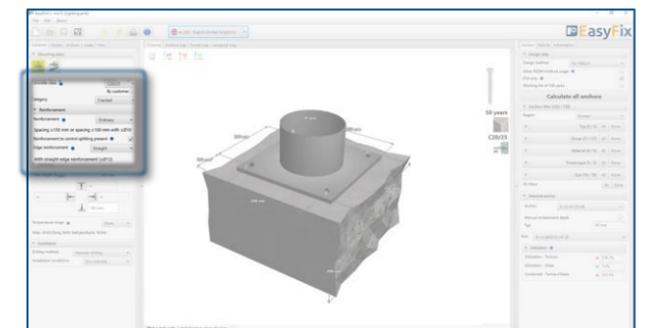
Concrete: Cracked

Category: Cracked

$f_{ck}$

20 MPa

$f_{ck, cube}$





# Road & Bridge calculations – Lighting pole

## 2 General data input area



- Determination of drilling method:  
Selecting from the list:
  - Hammer
  - Diamond
  - Automatic cleaning
- Determination of assembly condition  
Selecting from the list:
  - Dry concrete
  - Wet concrete
  - Flooded holes
  - Sea water
- Determination of service temperature:  
Selecting from the list of results filters the proper anchor group.

Temperature range *i* None ▾

Max. short/long term temperature: None

Installation ▾

Drilling method *i* Hammer drilling ▾

Installation conditions Hammer drilling

Temperature range *i* None ▾

Max. short/long term temperature: None

Installation ▾

Drilling method Hammer drilling

Installation conditions ▾

Dry concrete

Dry concrete

Wet concrete

Flooded holes

Sea water

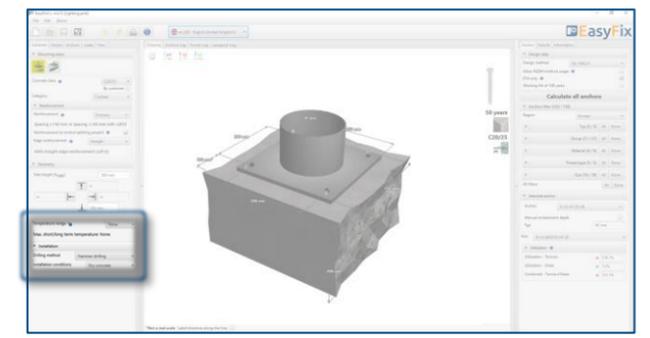
Temperature range *i* None ▾

Max. short/long term temperature: None

Installation ▾

Drilling method Hammer drilling

Installation conditions Dry concrete





# Road & Bridge calculations – Lighting pole

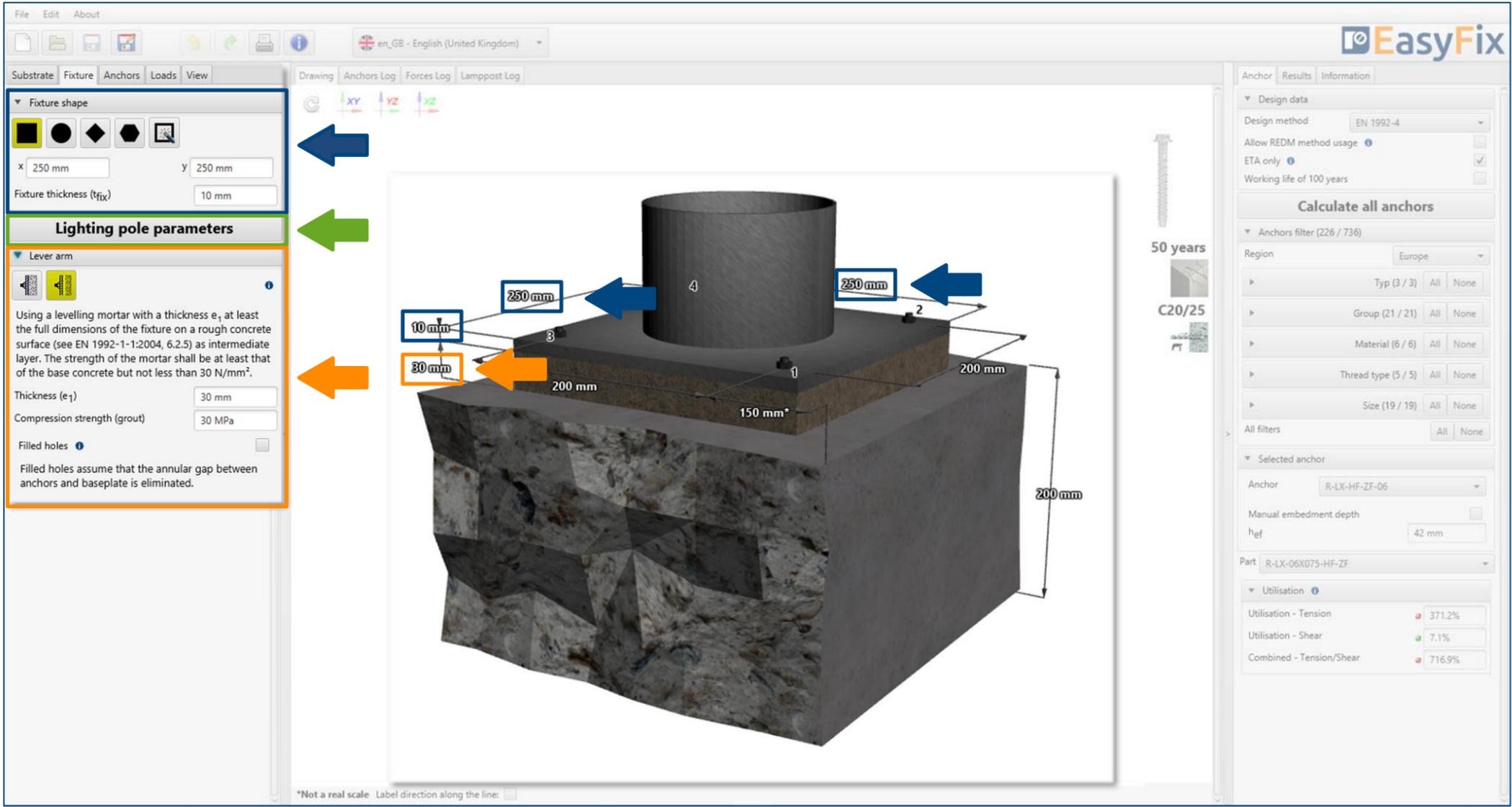
## 3 Defining of The plate and pole's details »

You can use basic shapes to define the geometry of the lantern base or use the **by user** option, which allows you to enter freeform shapes.  
The **Fixture tab** also allows you to enter full information about the installed lamp.

**Determining of fixture shape:**  
The geometry of the base is defined by entering dimensions in the side panel or on the 3D model.

**Determining of pole's parameters:**  
It opens an additional window in which you must complete the data concerning the mounted element.

**Determining of connection type:**  
Including grout, if exists.





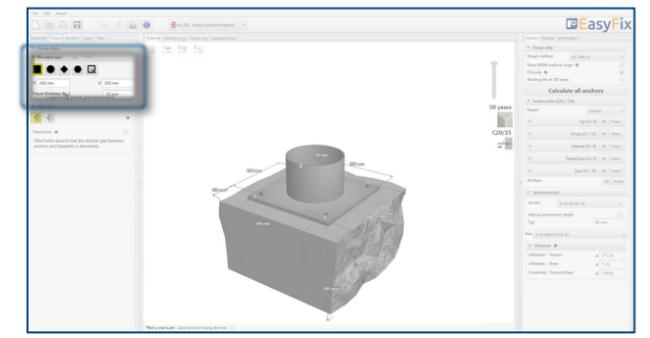
# Road & Bridge calculations – Lighting pole

## 3 Defining of The plate and pole's details »

Determining the shape of the base:  
The button for creating the shape of the base according to the user opens an additional window in which you can create any shape using the mouse or coordinate points.

The screenshot shows the 'Fixture shape' selection menu with a blue arrow pointing to the custom shape icon. Below it is a 'Fixture shape' button. A blue arrow points down to a detailed dialog window titled 'Fixture shape'. The dialog includes a toolbar, a canvas with a 250x250 mm square and a circle, and a 'Lighting pole parameters' table.

Point	x	y
1	0 mm	0 mm
2	250 mm	0 mm
3	250 mm	250 mm
4	0 mm	250 mm

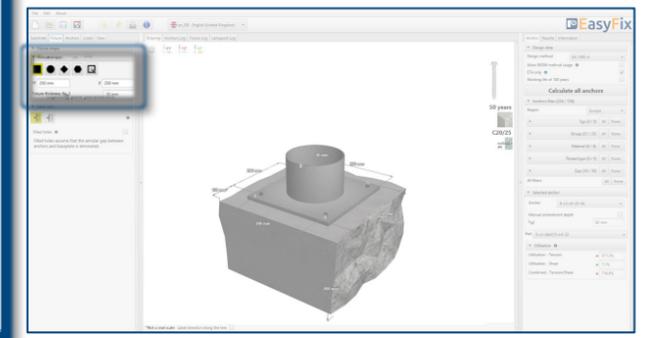




# Road & Bridge calculations – Lighting pole

## 3 Defining of The plate and pole's details »

Defining the parameters of the lightning pole:  
 The button for entering the parameters of the pole generates an additional window in which we enter detailed data about the installed lamp.





# Road & Bridge calculations – Lighting pole

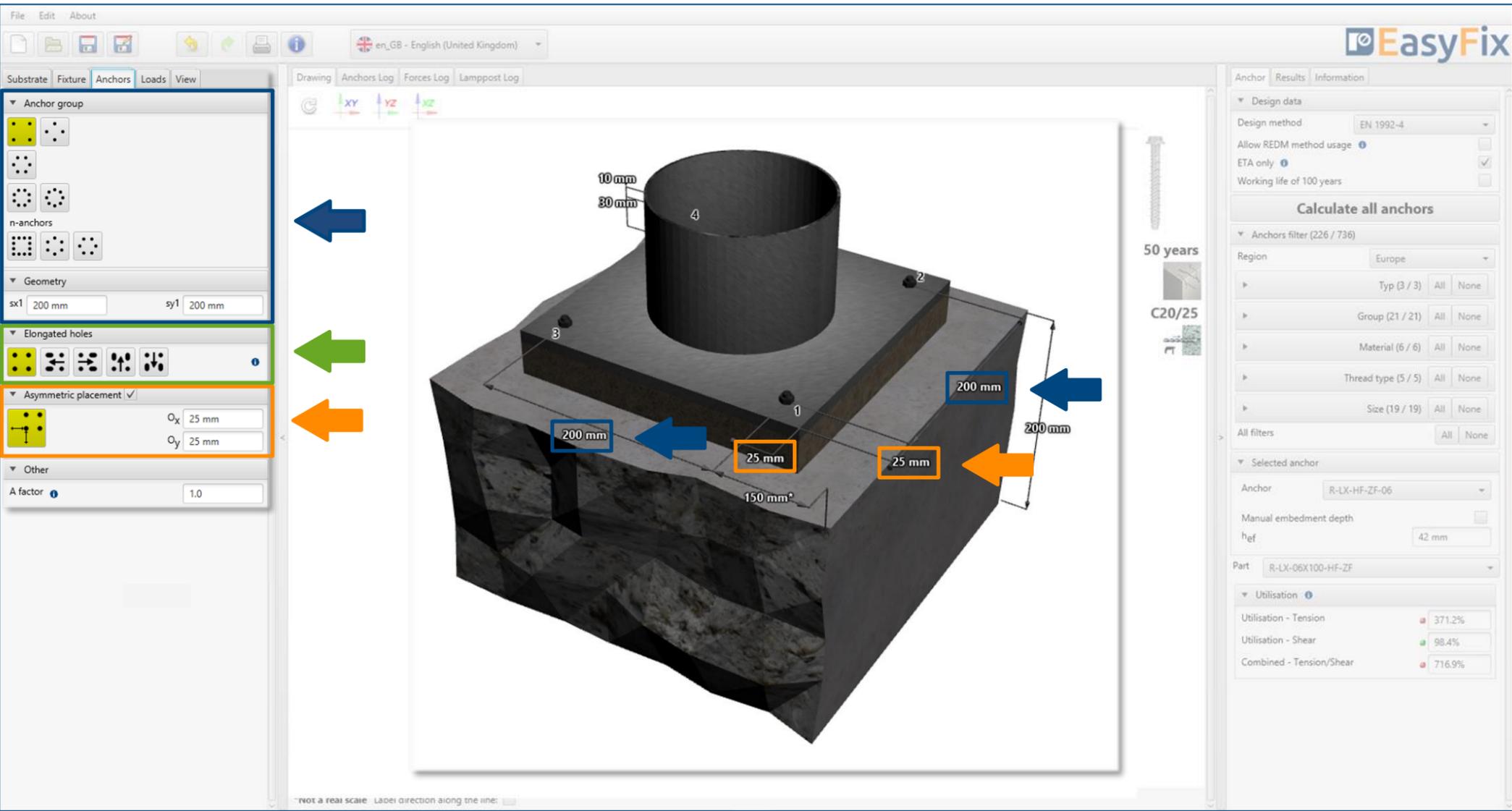
## 4 Defining of The anchor's layout »

In the **Anchors tab**, define the system of anchors with which the lamp will be attached to the ground. There are several standard distributions that are used in such systems to choose from. It was also possible to take into account the bean holes and the asymmetrical arrangement of the anchors.

Determination of the arrangement and spacing of anchors:  
Depending on the layout, the appropriate dimensions are entered in the side panel or on the 3D model.

Consideration of **elongated holes**:  
Declaring this option changes the distribution of shear forces to the anchors.

Determination of **asymmetrical distribution**:  
It determines the displacement of the anchor system in relation to the center of gravity of the base.





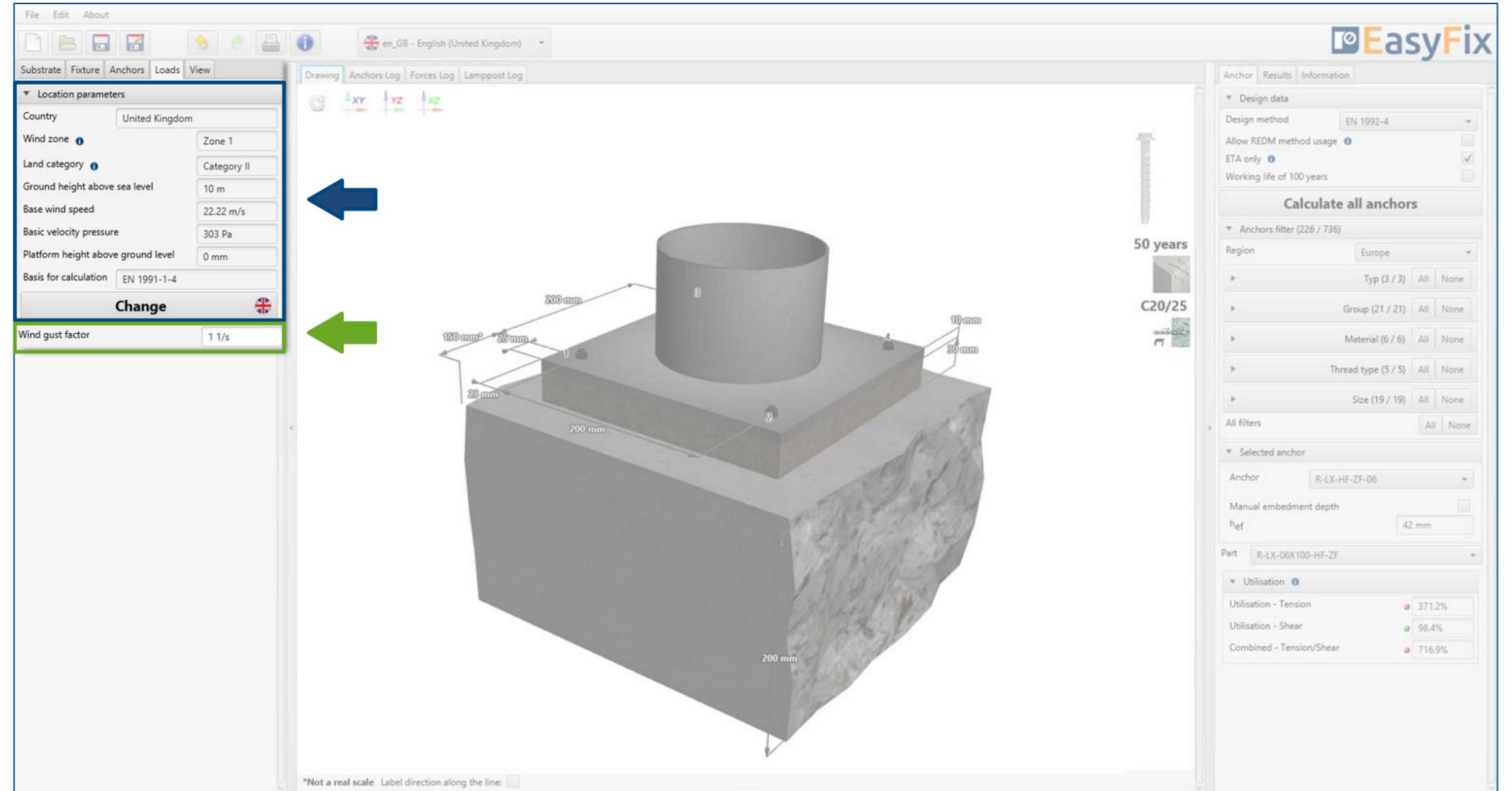
# Road & Bridge calculations – Lighting pole

5 Defining of The acting load »

The loads are determined on the basis of wind loads according to the national annexes to EN 1991-1-4, or entered manually by the user.

Specification of input data for the location of the mounted element.

Determination of the wind gust action factor.  
Value entered manually by the user.







# Road & Bridge calculations – Lighting pole

## 6 Analysis of The results

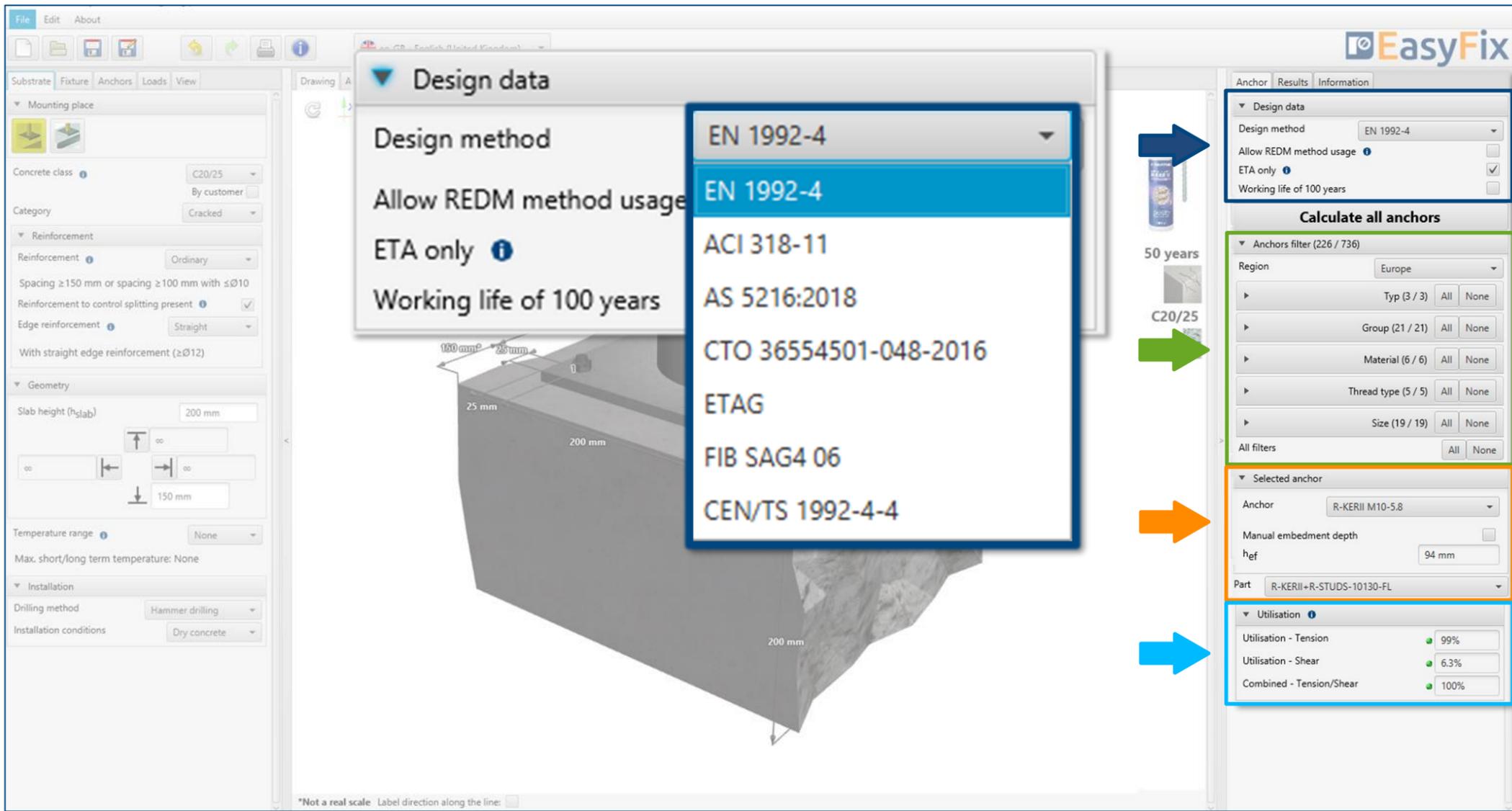
In the results panel, we can choose the appropriate design method, also REDM. Rawlplug Engineering Design Method - is a method that allows the calculation of anchor systems not covered by the EN and ETAG. methods. Unchecking the **ETA Data Only** box allows the use of test data from Rawlplug.

Selection of the **design method** and **service life** of the installed anchor.

**Anchor filters** allow you to choose the right product based on the region, type and material from which it is made.

**Selecting anchor** enables a more precise selection of the anchor and the imposition of the depth of its anchorage.

**Utilisation** Summary results window for the selected anchor





# Road & Bridge calculations – Lighting pole

## 6 Analysis of The results



Calculate all anchors opens an additional dialog with solution variants. Additionally, the anchor filter is duplicated and the option **show only ok**. Has been added, which allows you to filter only the correct solutions.

The screenshot displays the EasyFix software interface. A central dialog box titled "Calculate all anchors" is open, showing a table of anchor variants with columns for Anchor, Typ, hef, Tension, Shear, Combined, Total, and Apply. The table lists various anchor types like R-KERII M10-5.8, R-KERII M12-5.8, etc., with their respective utilization percentages. To the right of the dialog is an "Anchors filter" panel with options for Region (Europe), Typ (2/3), Group (20/20), Material (6/6), Thread type (5/5), and Size (19/19). Below the filter is a "Show OK only" checkbox which is checked. In the background, the main software interface is visible, including a "Calculate all anchors" button in the right-hand panel and a "50 years" design life indicator.

Anchor	Typ	hef	Tension	Shear	Combined	Total	Apply
R-KERII M10-5.8	Bonded	98 mm	96.5%	6.3%	96.3%	96.5%	
R-KERII M10-5.8 HDG	Bonded	98 mm	96.5%	6.3%	96.3%	96.5%	
R-KERII M12-5.8	Bonded	98 mm	97.5%	6.2%	97.7%	97.7%	<input checked="" type="checkbox"/>
R-KERII M12-5.8 HDG	Bonded	98 mm	97.5%	6.2%	97.7%	97.7%	
R-KERII M16-5.8	Bonded	101 mm	96.7%	5.9%	96.4%	96.7%	
R-KERII M16-5.8 HDG	Bonded	101 mm	96.7%	5.9%	96.4%	96.7%	
R-KERII M20-5.8	Bonded	102 mm	97.6%	5.7%	97.7%	97.7%	
R-KERII M20-5.8 HDG	Bonded	102 mm	97.6%	5.7%	97.7%	97.7%	
R-KERII M24-5.8	Bonded	102 mm	98.7%	5.5%	99.3%	99.3%	
R-KERII M24-5.8 HDG	Bonded	102 mm	98.7%	5.5%	99.3%	99.3%	
R-KEXII M10-5.8	Bonded	126 mm	97.7%	6.1%	98.1%	98.1%	
R-KEXII M10-5.8 HDG	Bonded	126 mm	97.7%	6.1%	98.1%	98.1%	
R-KEXII M12-5.8	Bonded	148 mm	98.7%	5.8%	99.4%	99.4%	
R-KEXII M12-5.8 HDG	Bonded	148 mm	98.7%	5.8%	99.4%	99.4%	
R-KEXII M16-5.8	Bonded	100 mm	96.8%	5.9%	96.7%	96.8%	



# Road & Bridge calculations – Lighting pole

## 6 Analysis of The results »

**Resulting forces in the anchors**  
gives the values of the tension and shear forces acting on individual anchors.

**Tensile loads**  
the percentage utilisation of the anchor system due to tensile forces in individual failure models

**Shear loads**  
the percentage utilisation of the anchor system from shear forces in individual failure patterns

**Combined Tension/Shear**  
combination of shear and tension actions – percentage utilisation of steel and concrete

The screenshot shows the EasyFix software interface. On the left, there are configuration panels for 'Mounting place', 'Reinforcement', 'Geometry', and 'Installation'. The central area displays a 3D model of a concrete slab with a lighting pole on top. Dimensions are shown: slab width 200 mm, slab height 200 mm, and pole diameter 10 mm. On the right, the 'Results' panel is visible, showing design data and a table of 'Resulting anchor forces'.

**Design data:**  
 Design method: EN 1992-4  
 Allow REDM method usage:   
 ETA only:   
 Working life of 100 years:   
 Anchor: R-KERII M12-5.8

**Calculate all anchors**

No.	V <sub>x</sub>	V <sub>y</sub>	N
1	-78.3 N	-215.7 N	18.193 kN
2	-78.3 N	-372.3 N	18.193 kN
3	78.3 N	-215.7 N	0 kN
4	78.3 N	-372.3 N	0 kN

**Tensile load:**

β <sub>N1</sub>	β <sub>N2</sub>	β <sub>N3</sub>	β <sub>N4</sub>	β <sub>N5</sub>
65%	80.1%	97.5%	ND	ND

**Shear load:**

β <sub>V1</sub>	β <sub>V2</sub>	β <sub>V3</sub>	β <sub>V4</sub>
2.9%	ND	1.3%	6.2%

**Combined - Tension/Shear:**

Steel failure	42.3%
Concrete failure	97.7%



# Road & Bridge calculations – Lighting pole

## 6 Analysis of The results



Installation data  
Installation parameters of the designed anchor

Dynamic links to:  
Technical Library  
BIM Library  
Rawplug Technical Helpdesk RTH

The screenshot shows the EasyFix software interface. On the left, there are configuration panels for 'Mounting place', 'Reinforcement', 'Geometry', and 'Installation'. The central area displays a 3D model of a concrete slab with a cylindrical anchor on top. Dimensions are shown: slab height is 200 mm, slab width is 250 mm, and the anchor has a diameter of 10 mm. On the right, a 'Technical data' panel is open, showing installation parameters for part R-KERII-R-STUDS-12160-FL. A blue arrow points from the 3D model to the technical data panel, and a green arrow points from the technical data panel to the BIM library link.

Installation data	
Thread diameter (d)	12 mm
Hole diameter in substrate (d <sub>h</sub> )	14 mm
Min. hole depth in substrate (h <sub>g</sub> )	103 mm
Nominal depth (h <sub>nom</sub> )	98 mm
Calculated min. substrate thickness (h <sub>min</sub> )	200 mm
Installation torque (T <sub>inst</sub> )	40 Nm
Anchor length (L)	160 mm
Fixture thickness (t <sub>fix</sub> )	10 mm
Hole diameter in fixture (d <sub>f</sub> )	14 mm
Amount of resin per one mount (normal loss)	10 ml

Technical data: ETA-21/0242 v.11/03/2021

Show photo

**TechnicalLibrary**  
**BIM**

Technical questions



# Road & Bridge calculations – Lighting pole

## 7 Generating The printout



In the printout panel it is possible to set regional options, i.e., language, decimal separator and system of units. The printout in pdf format contains all the data that is necessary in design and during the installation of the product.

Print option. Enables you to generate a document in a pdf format.

Installation data	
read diameter (d)	12 mm
hole diameter in substrate (d <sub>g</sub> )	14 mm
min. hole depth in substrate (h <sub>g</sub> )	103 mm
nominal depth (h <sub>nom</sub> )	98 mm
calculated min. substrate thickness (h <sub>min</sub> )	200 mm
installation torque (T <sub>inst</sub> )	40 Nm
anchor length (L)	160 mm
fixture thickness (t <sub>fix</sub> )	10 mm
hole diameter in fixture (d <sub>f</sub> )	14 mm
amount of resin per one mount (normal loss)	10 ml

Technical data: ETA-21/0242 v.11/03/2021

Show photo

TechnicalLibrary BIM

Technical questions

