









EasyFix

Design solutions worth your while

User Manual

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EasyFix

1

INNOVATIVE CALCULATION APPLICATION

EasyFix is an innovative software package allowing you to conduct design calculations required to plan fixings for diverse construction elements using Rawlplug branded products.

Individual program modules are dedicated to specific segments and stages of investment. Each of them enables real-time calculations and provides the user with virtually unlimited possibilities of matching fixings and elements to be fixed to what is actually needed at the given time.

SIGNATURE SOLUTION FOR DESIGNERS

EasyFix is Rawlplug's signature tool, developed by a team of experts collaborating with professionals on a daily basis, watching them work and tracking their expectations. And there is more to that, since Rawlplug EasyFix is kept up to date by following the latest design guidelines conforming with EAD, ETAG and EUROCODE, not only ensuring full compliance between calculations and standards, but also utmost precision and utility value.

EasyFix is a complementary solution developed in response to real-life needs of architects, construction engineers and contractors.

2

INTUITIVE USER MANUAL

This EasyFix User Manual is, first and foremost, a highly detailed summary of all features available under all tabs of the application modules, and secondly, a very transparent presentation of these features using actual displays available in the application, including results of diverse calculations shown on the screen.

In response to users' expectations, we have also prepared a specific design project case study comprising calculations for application of chemical anchors in a model multi-bay shopfloor using the EasyFix PRO application from Rawlplug.

3



4

EASY ACCESS TO FREE-OF-CHARGE APPLICATION

In order to download the program, navigate to the rawlplug.com website and enter the Services/Design & Software tab, or make use of traditional data carriers available from Rawlplug's sales representatives. Keep in mind that in order to be able to use all the software features, you only need to register at rawlplug.com. As a feedback to the subscription, the user receives a clear activation instruction which allows for the unabridged version of EasyFix to be installed.

The Rawlplug EasyFix User Manual for individual modules is available:

- in the Services/Design & Software tab on rawlplug.com,
- directly in the program, for each module respectively.

5

PRIMARY AREAS OF OPERATION OF THE RAWLPLUG EASYFIX APPLICATION:

- designing of fixings for concrete substrates
- designing of chemical rebar anchoring in concrete substrates
- designing of fixings by taking wind forces into account

Calculations pertaining to specific aspects are conducted using modules dedicated to individual segments of construction works. Each offers specific features that enable quick, precise and highly useful calculations which take the nature of the given scope of works into consideration.




SCOPE OF DESIGN ACTIVITY	MODULE TYPE	CONFORMITY BETWEEN MODULE FEATURES AND GUIDELINES
designing of fixings for concrete substrates	CONCRETE module	There are two calculation modules dedicated to this task, enabling computation to be performed in accordance with the guidelines provided in ETAG 001, Annex C, technical report EOTA TR 029, ETAG 020 for concrete substrates as well as the latest revision of the EN 992-4 standard for designing and EOTA TR 055.
	BALUSTRADE module	
designing of chemical rebar anchoring in concrete substrates	REBAR module	This category has a dedicated module that makes it possible to determine the required design depth of rebar anchoring in concrete structures based on the guidelines defined in the EN 1992-1-1 standard and Technical Report TR 023.
designing of fixings by taking wind forces into account	FLAT ROOF module	Two calculation modules are used for this purpose, delivering computational features based on the EN 1991-1-4 standard on wind actions as well as the Russian wind standard (СП 20.13330.2011). The relevant calculations also use data conforming with ETAG 006 and ETAG 014.
	FACADE module	

Each module consists of subject-specific tabs with applicable features.

CONCRETE module	BALUSTRADE module	REBAR module	FACADE module	FLAT ROOF module
<ul style="list-style-type: none"> • Fixture • Anchors • Substrate • Loads • Results • Project details • Documents 	<ul style="list-style-type: none"> • Fixture • Anchors • Substrate • Loads • Results • Project details • Documents 	<ul style="list-style-type: none"> • Existing construction • New construction • Loads • Results 	<ul style="list-style-type: none"> • Location • Building • Insulation • Fixings • Project properties 	<ul style="list-style-type: none"> • Project details • Location • Building parameters • Roof outline • Slopes • Roof parameters

What you are about to find in further sections of the User Manual is, firstly, a detailed summary of all features available under all tabs, and secondly, a very transparent presentation of these features using actual displays available in the application along with results of calculations shown on the screen. The Manual comprises all the aforementioned modules.

All User Manuals for individual modules of the EasyFix application may be downloaded from the Services/Design & Software tab on rawlplug.com, but they can also be displayed directly in the program by clicking the  icon, for each module respectively.



User Manual

CONCRETE module

Easyfix

The CONCRETE module of the EasyFix application from Rawlplug enables you to make an optimum choice of fixings for concrete substrates. The computational mechanism implemented in the module is based on ETAG 001, ETAG 020 and the latest EN 1992-4 standard. The CONCRETE module contains numerous most popular shapes of fixtures as well as more than a dozen pre-set fixing layouts most frequently used in practice. And even more importantly, it allows you to customise both the shape and the arrangement of fixings, taking the specifics of every design job into consideration. The key features of the module include the capacity to freely move not only anchors, but also loads against the fixture's centre of gravity. Moreover, the optimisation feature makes it possible to choose the right anchor type and size quickly and easily, also by means of a number of helpful filters and sorting options. What is truly unique about the module is that it enables you to perform design jobs using REDM, i.e. the Rawlplug Engineering Design Method, being a proprietary engineering method that allows designing of even the most highly specialised fixing layouts based on results of long years of research as well as Rawlplug's expertise and experience. This means that besides calculations based on the ETAG requirements and those defined in European Technical Assessments with regard to individual products, you can also run calculations using RAD (Rawlplug Advanced Design) data.

The CONCRETE module comprises the following tabs:
Fixture, Anchors, Substrate, Loads, Results, Project details and Documents.

 EASYFIX

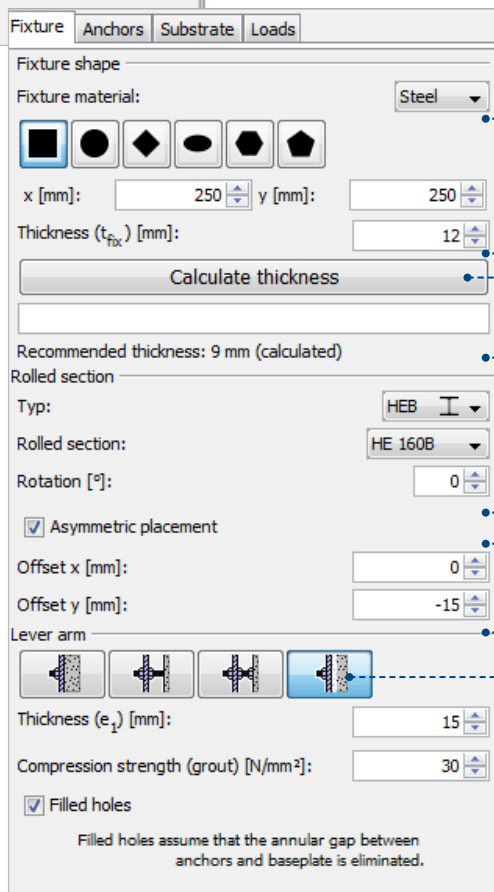
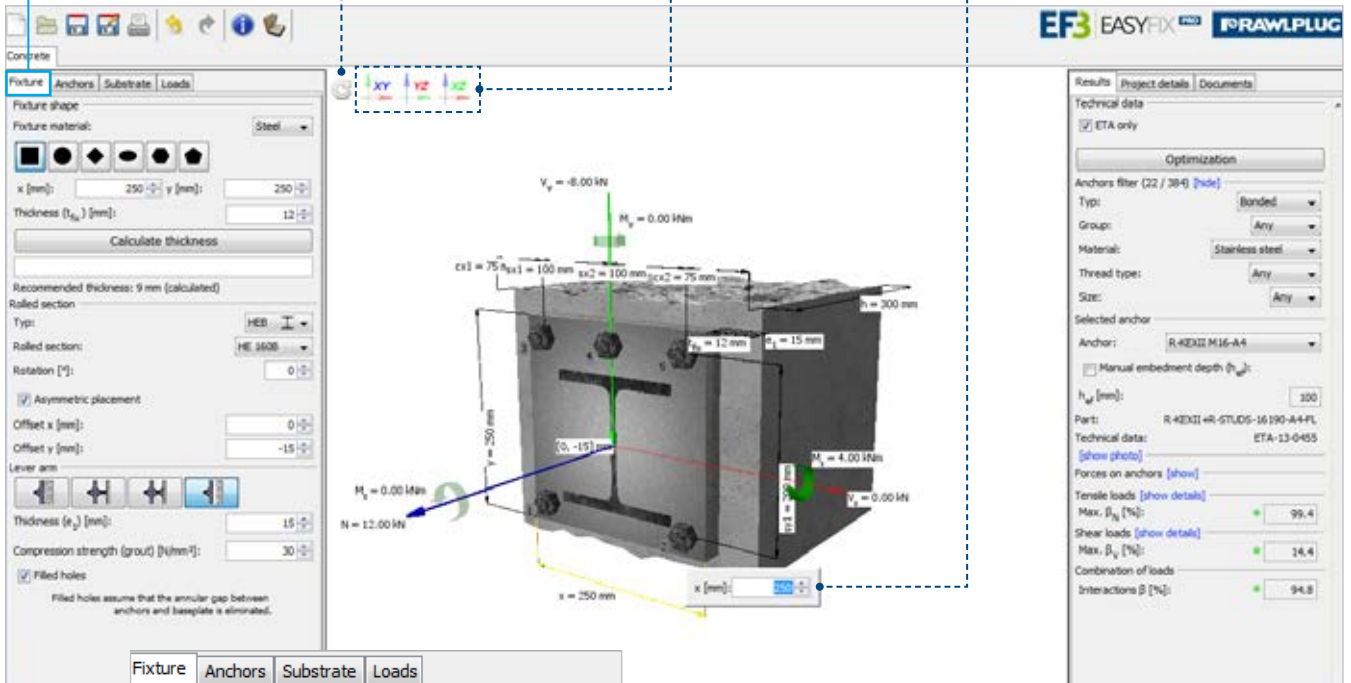
The Fixture tab enables users to:

Fixture

1. rotate the model and return to the initial display

2. display the drawing in the XY, YZ and XZ axis view

3. enter data on the model by clicking dimension lines



4. choose fixture parameters, such as shape or dimensions

7. position a section asymmetrically against the co-ordinate system

5. calculate fixture slab thickness, provided that a section has been added and loads defined

6. choose the section to be fixed and define its shape, size and optional rotation

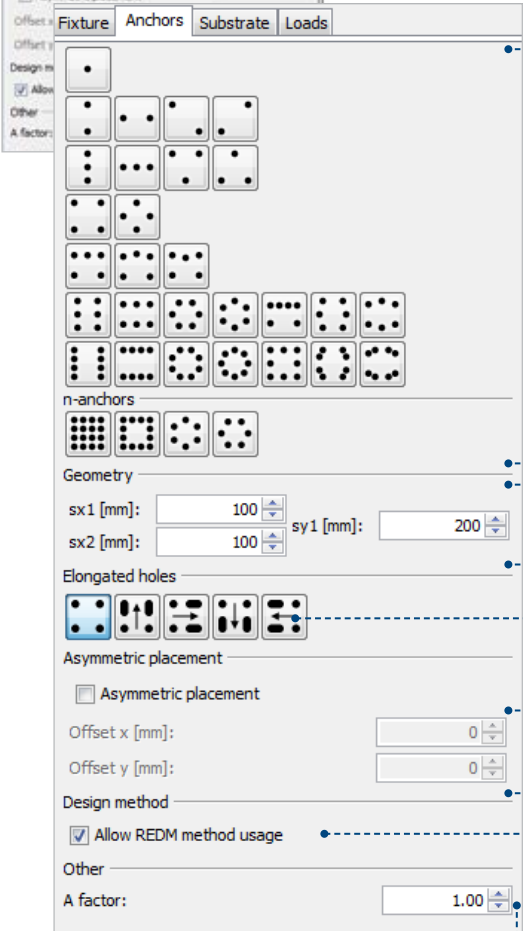
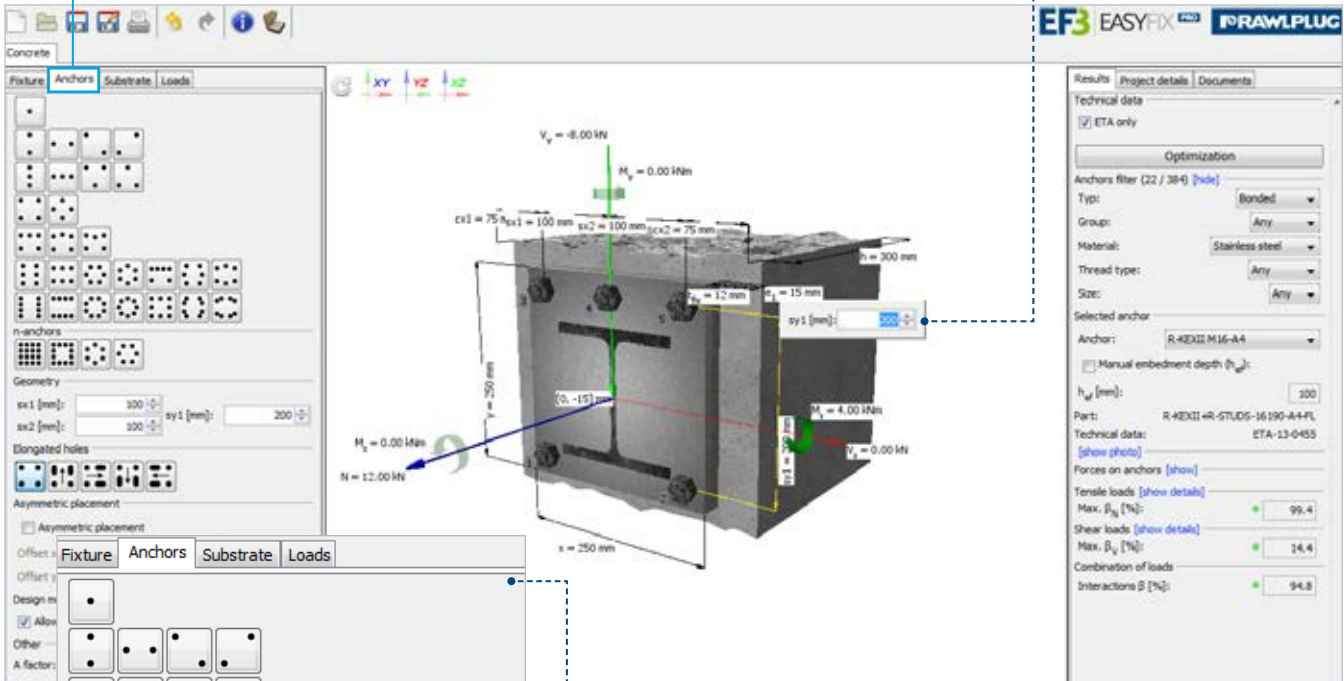
8. define offset for slab fixing



The following options are available from the Anchors tab:

Anchors

3. possibility to enter all dimensions on the model



1. choice of number and arrangement of anchors

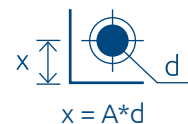
2. defining anchor spacing

4. choice of elongated holes set along the selected fixture edge

5. asymmetric placement against the fixture's centre of gravity

6. option to allow the Rawlplug Engineering Design Method (REDM) use

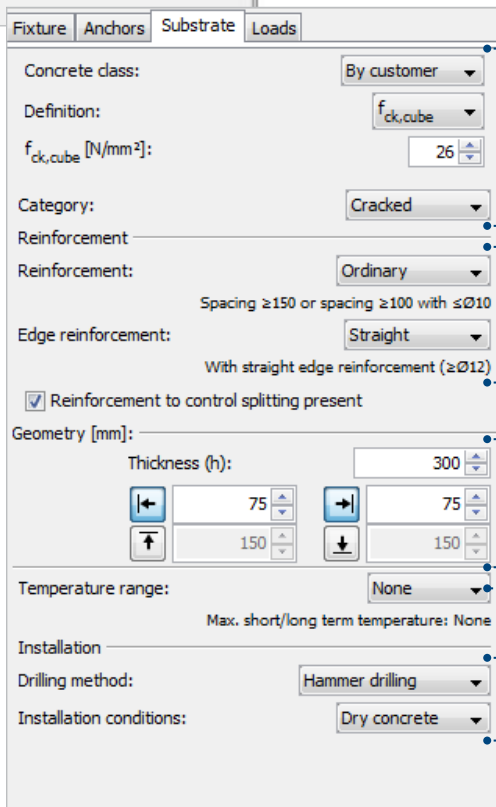
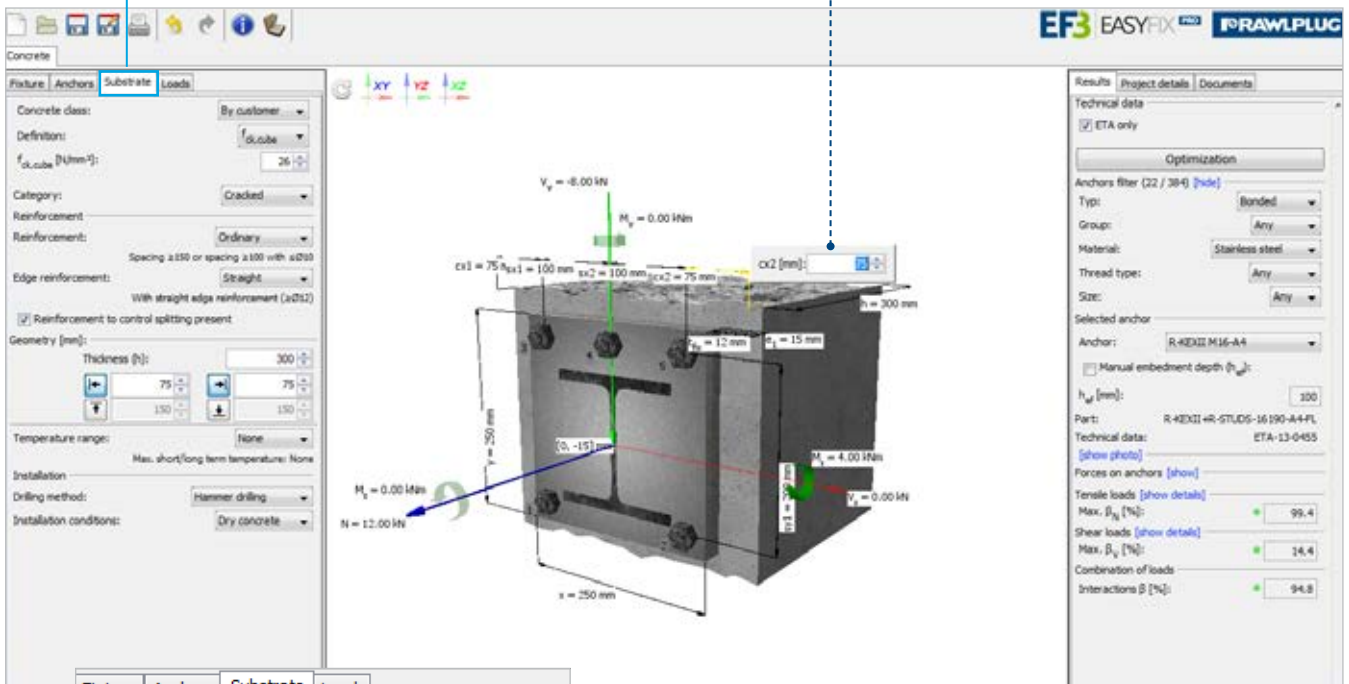
7. option to enter the A factor defining the distance between hole and fixture edge



The Substrate tab allows the user to:

Substrate

4. enter all dimensions on the model



1. choose substrate type according to concrete class specified in the EC standard or define custom concrete class, as the need be, using a cylindrical or a cubical unit

2. define the existing reinforcement layout

3. define the substrate geometry for thickness and spacing between anchors and substrate edge

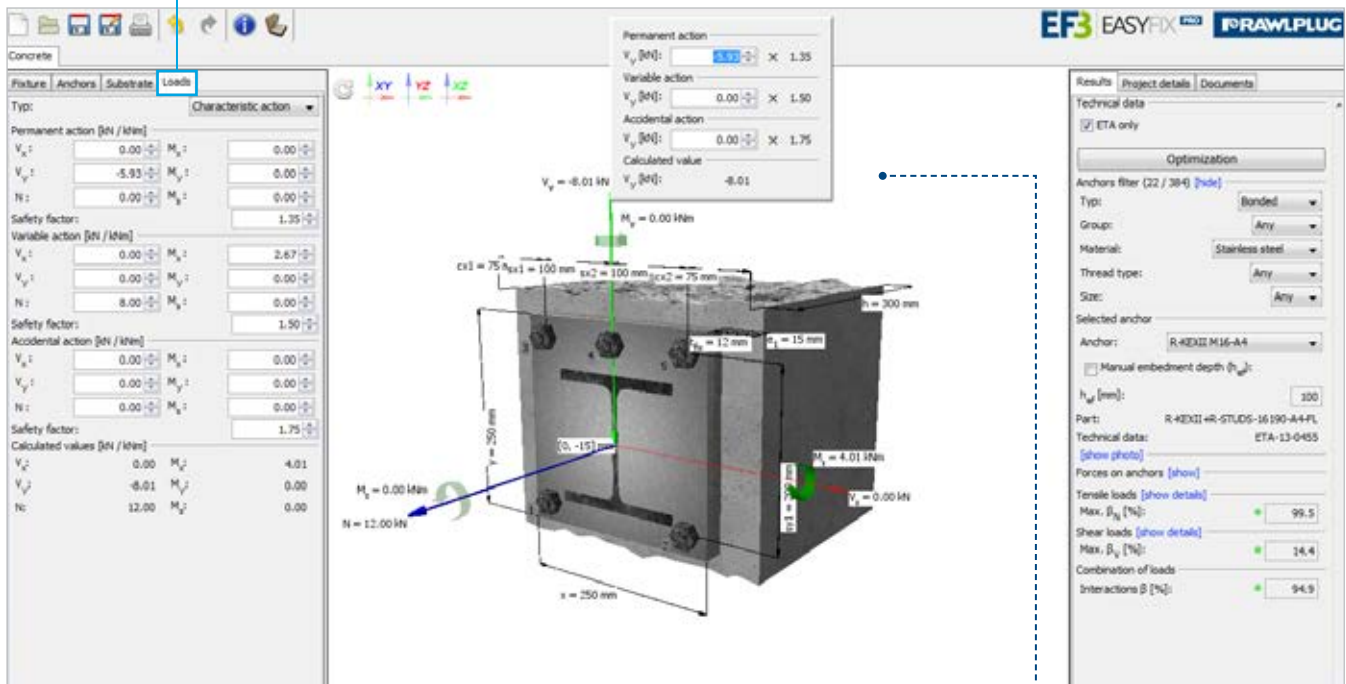
5. define the range of permissible operating temperatures for anchors (bonded)

6. define anchor installation parameters



The following options are available from the Loads tab:

Loads



Fixture Anchors Substrate **Loads**

Type: Characteristic action

Permanent action [kN / kNm]

V_x : 0.00 M_x : 0.00
 V_y : -5.93 M_y : 0.00
 N : 0.00 M_s : 0.00

Safety factor: 1.35

Variable action [kN / kNm]

V_x : 0.00 M_x : 2.67
 V_y : 0.00 M_y : 0.00
 N : 8.00 M_s : 0.00

Safety factor: 1.50

Accidental action [kN / kNm]

V_x : 0.00 M_x : 0.00
 V_y : 0.00 M_y : 0.00
 N : 0.00 M_s : 0.00

Safety factor: 1.75

Calculated values [kN / kNm]

V_x	0.00	M_x	4.01
V_y	-8.01	M_y	0.00
N	12.00	M_s	0.00

1. defining the type of loads, either characteristic or design

Permanent action

V_y [kN]: -5.93 × 1.35

Variable action

V_y [kN]: 0.00 × 1.50

Accidental action

V_y [kN]: 0.00 × 1.75

Calculated value

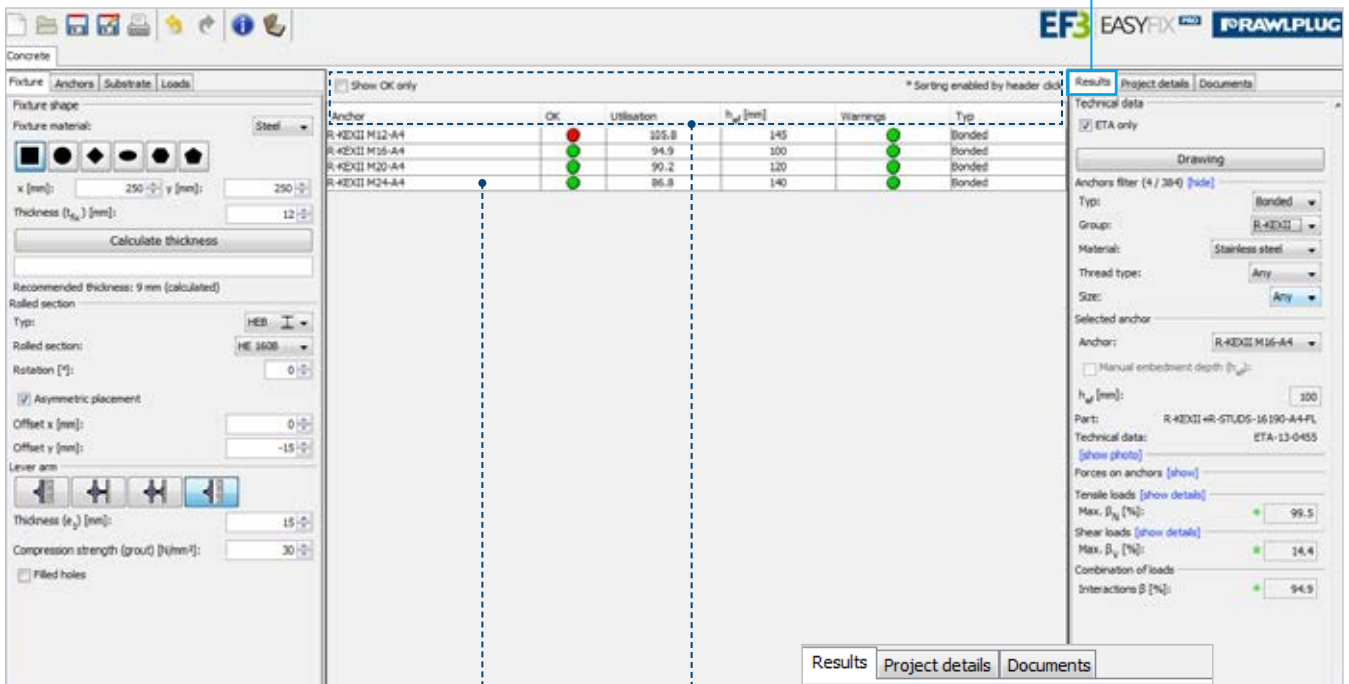
V_y [kN]: -8.01

2. entering values for design and characteristic loads (including the possibility to change safety factors against applicable standards), including directly on the model



The Results tab features the following options:

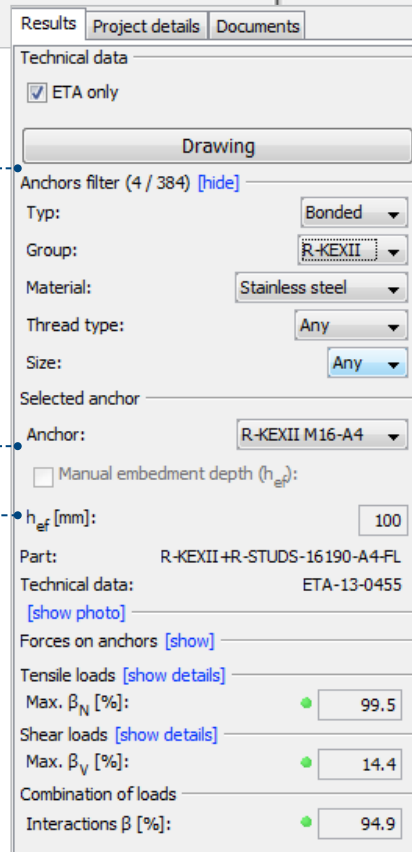
Results



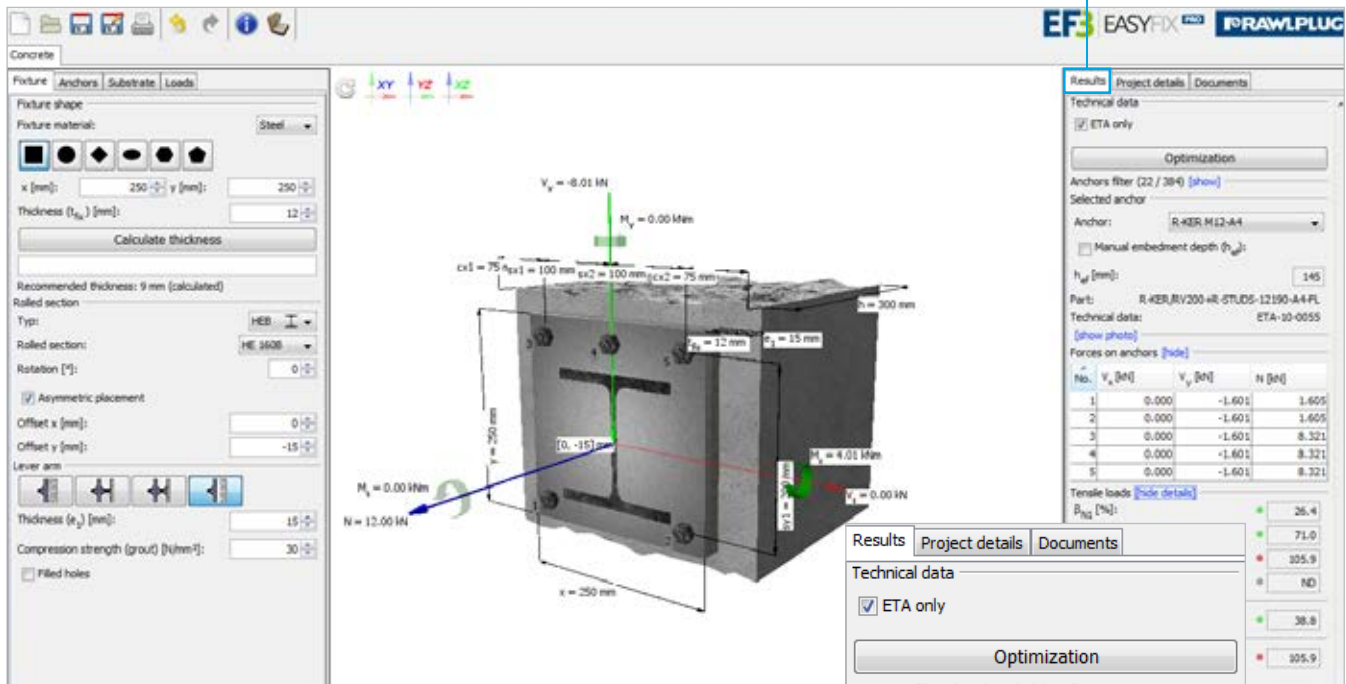
1. optimisation of the anchor choice according to pre-set parameters

2. anchor selection, including by filtering and sorting

3. option to enter custom anchoring depth for bonded anchors



Results



1. anchor choice and visualisation

2. displaying values of forces affecting each anchor and the neutral axis

3. displaying values of loads according to individual models of rupture

4. displaying calculation results, including identification of their correctness or error

Results Project details Documents

Technical data

ETA only

Optimization

Anchors filter (22 / 384) [show]

Selected anchor

Anchor: R-KER M12-A4

Manual embedment depth (h_{ef}):

h_{ef} [mm]: 145

Part: R-KER/RV200+R-STUDS-12190-A4-FL

Technical data: ETA-10-0055

[show photo]

Forces on anchors [hide]

No.	V_x [kN]	V_y [kN]	N [kN]
1	0.000	-1.601	1.605
2	0.000	-1.601	1.605
3	0.000	-1.601	8.321
4	0.000	-1.601	8.321
5	0.000	-1.601	8.321

Tensile loads [hide details]

β_{N1} [%]: 26.4

β_{N2} [%]: 71.0

β_{N3} [%]: 105.9

β_{N4} [%]: ND

Shear loads [show details]

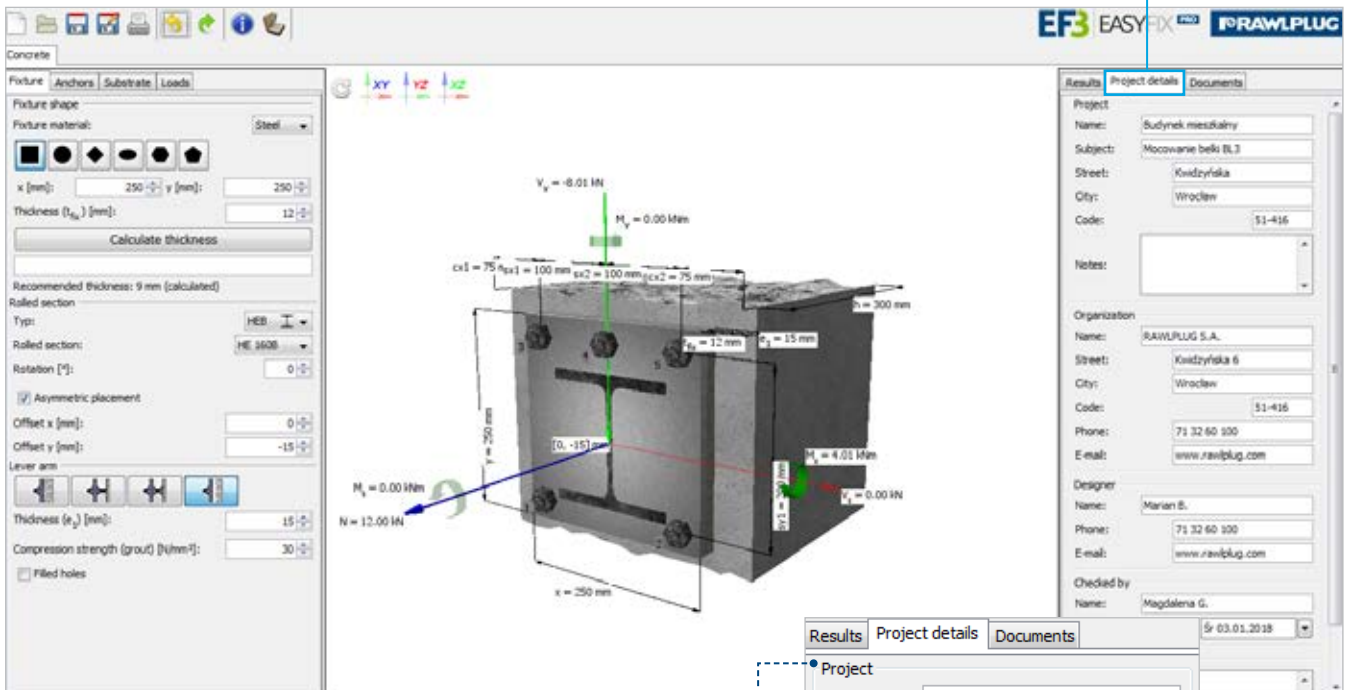
Max. β_V [%]: 38.8

Combination of loads

Interactions β [%]: 105.9

The Project Details tab allows the user to enter detailed data of the pending design project as well as of the engineering office

Project details



1. fields for entering data to identify: design project, engineering office location, designer, reviewer

Results Project details Documents

Project

Name: Budynek mieszkalny

Subject: Mocowanie belki BL3

Street: Kwidzyńska

City: Wrocław

Code: 51-416

Notes:

Organization

Name: RAWLPLUG S.A.

Street: Kwidzyńska 6

City: Wrocław

Code: 51-416

Phone: 71 32 60 100

E-mail: www.rawlplug.com

Designer

Name: Marian B.

Phone: 71 32 60 100

E-mail: www.rawlplug.com

Checked by

Name: Magdalena G.

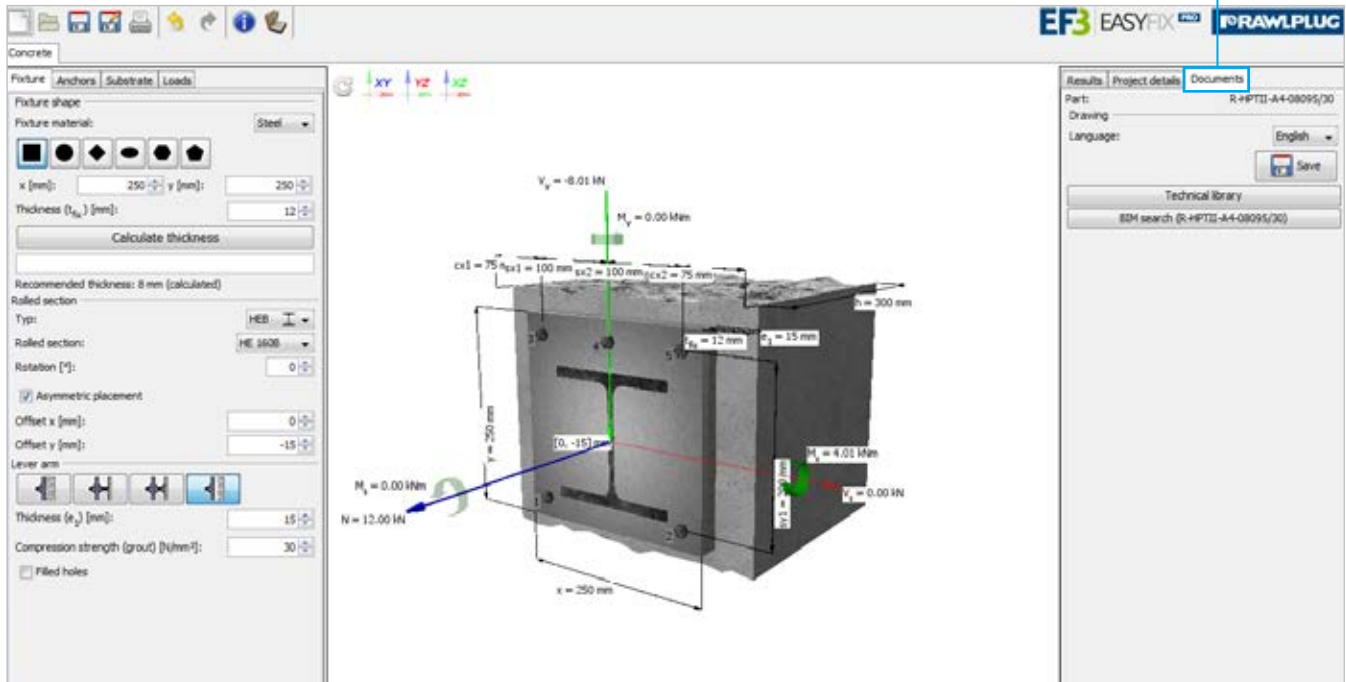
Date: Śr 03.01.2018

General



The Documents tab allows the user to access a list of documents pertaining to the given fixing solution and download them.

Documents



User Manual

BALUSTRADE module

EasyFix

The BALUSTRADE module of the EasyFix application from Rawlplug is based on the same data, guidelines and the computational mechanism implemented in the CONCRETE module, while it is dedicated to balustrades, and as such, it covers fixing configurations and load types specific to this segment. Moreover, it includes the guidelines laid down in the EN 1991-1-1 standard which recommends the range of characteristic loads for different use categories.

The BALUSTRADE module comprises the following tabs: Fixture, Anchors, Substrate, Loads, Results, Project details and Documents.

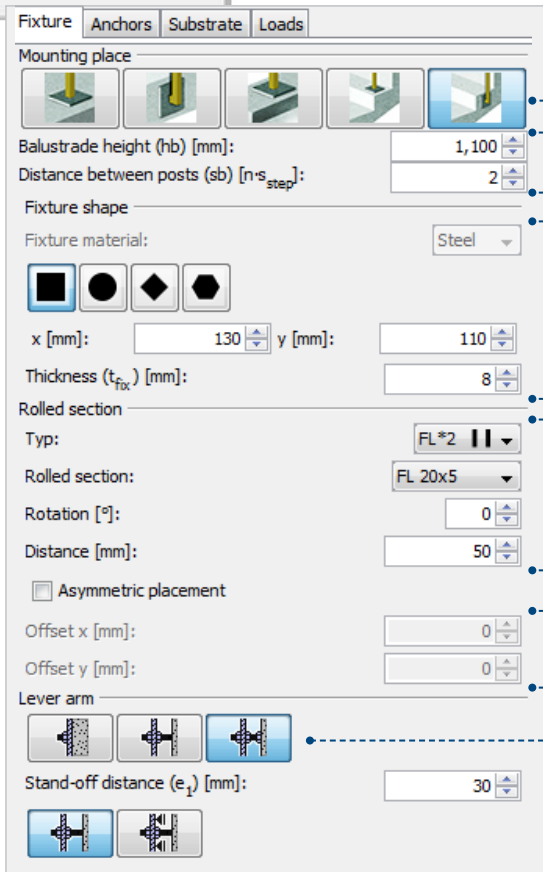
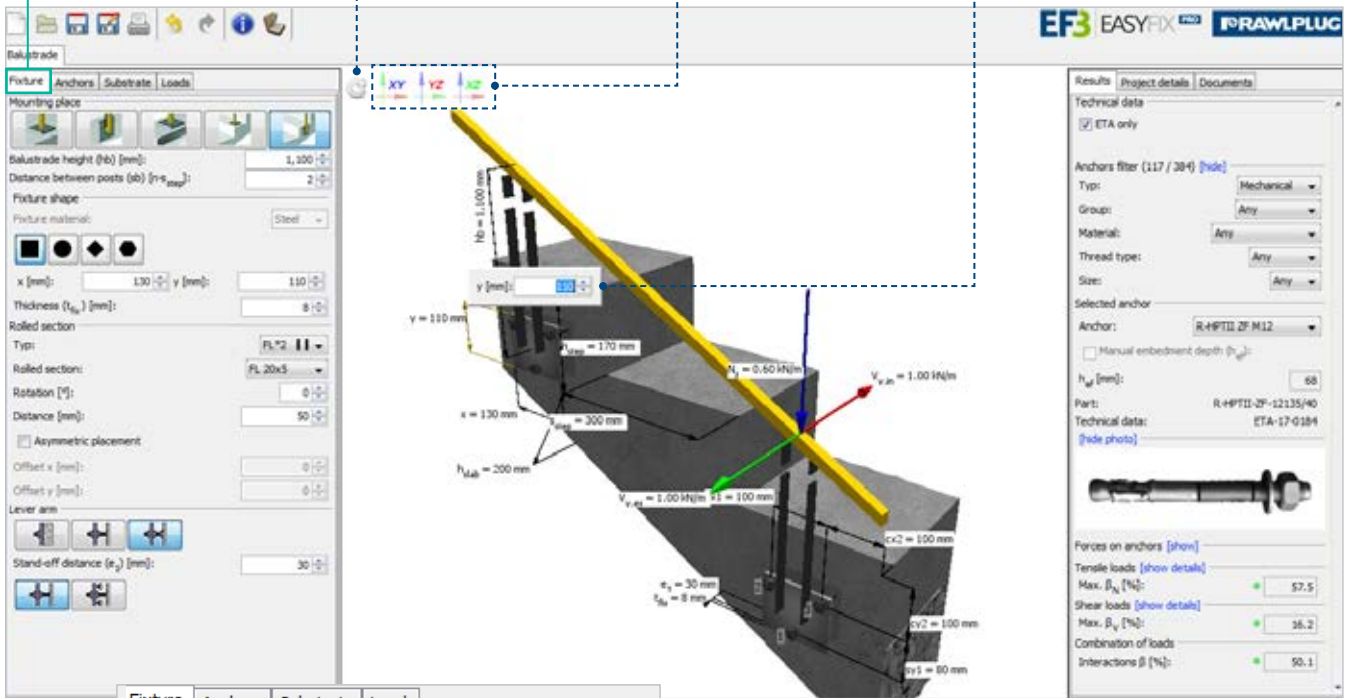
The Fixture tab enables users to:

Fixture

1. rotate the model and return to the initial display

2. display the drawing in the XY, YZ and XZ axis view

3. enter data on the model by clicking dimension lines



4. indicate the balustrade mounting place

5. enter characteristic dimensions of the given model

6. choose fixture parameters for shape and dimensions

7. add a rolled section by defining its shape, size and rotation

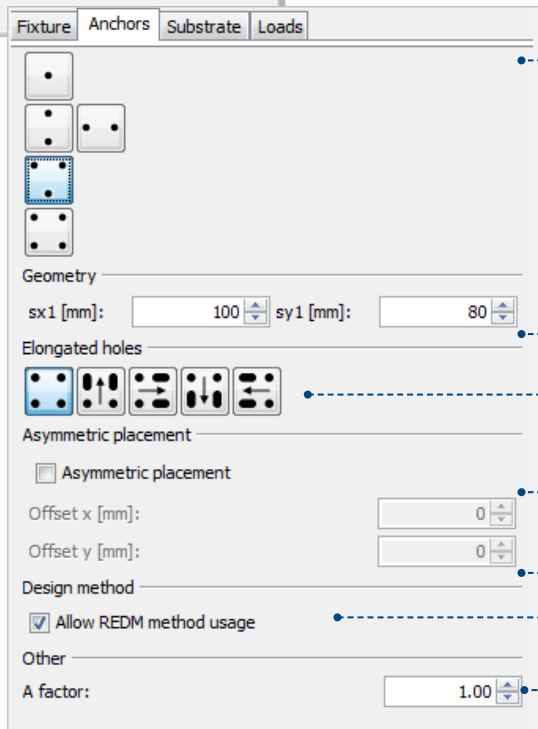
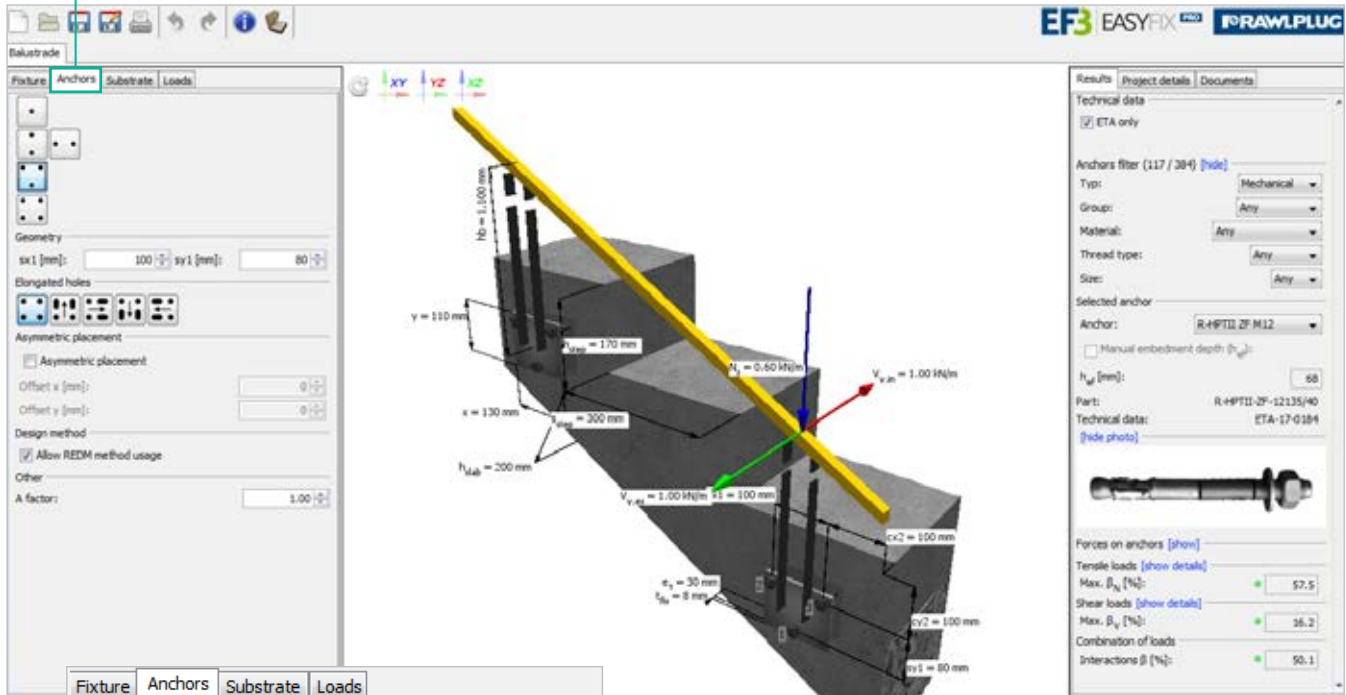
8. define asymmetric section placement against the fixture centre of gravity

9. define offset for slab fixing



The following options are available from the Anchors tab:

Anchors



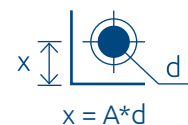
1. choice of number and arrangement of anchors

2. choice of elongated holes set along the selected fixture edge

3. option to define asymmetric anchor arrangement against the co-ordinate system

4. option to allow the Rawlplug Engineering Design Method (REDM) use

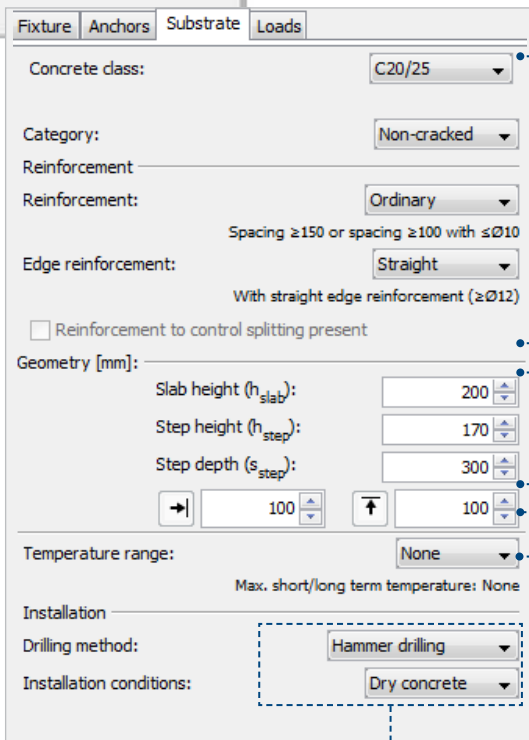
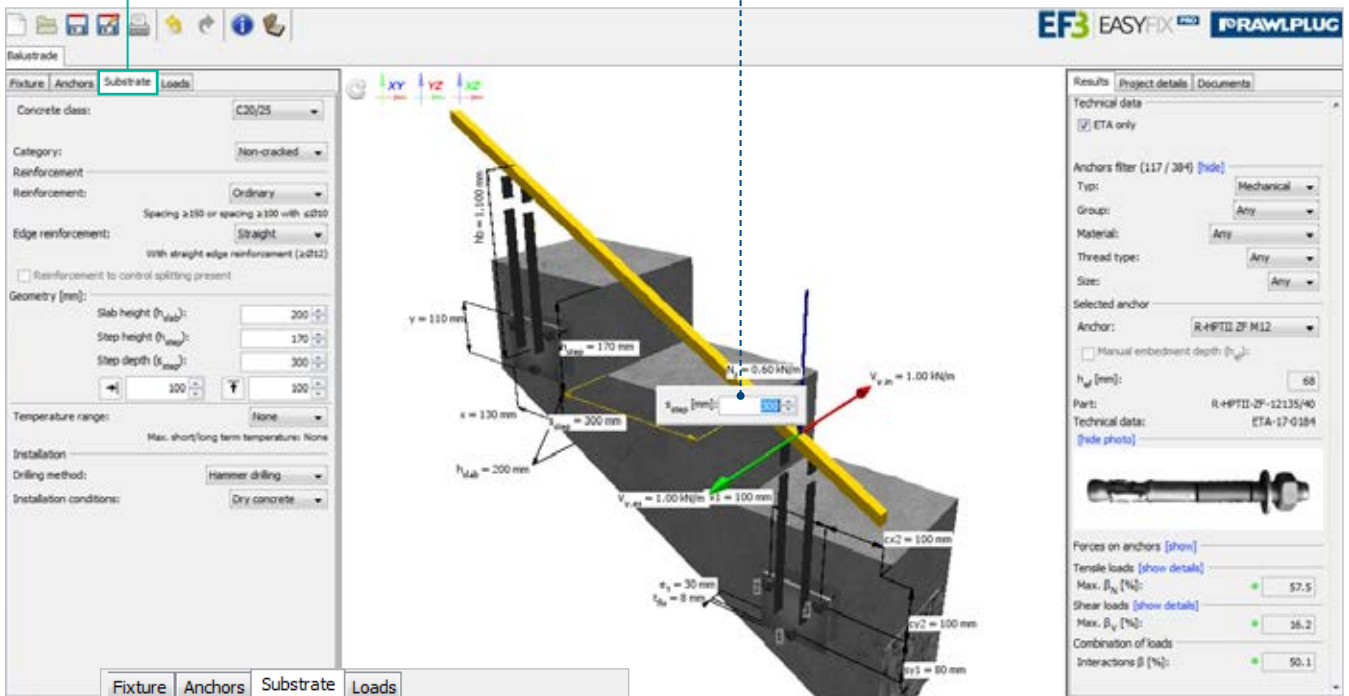
5. option to define distance between hole edge and slab edge



The following options are available from the Substrate tab:

Substrate

1. possibility to enter all dimensions on the model



2. selecting substrate by defining concrete category and reinforcement type

3. option to enter substrate dimensions characteristic of the given model, including slab thickness, step height and depth as well as pedestal dimensions

4. option to set minimum edge distance

5. option to define the range of permissible operating temperatures for anchors (bonded)

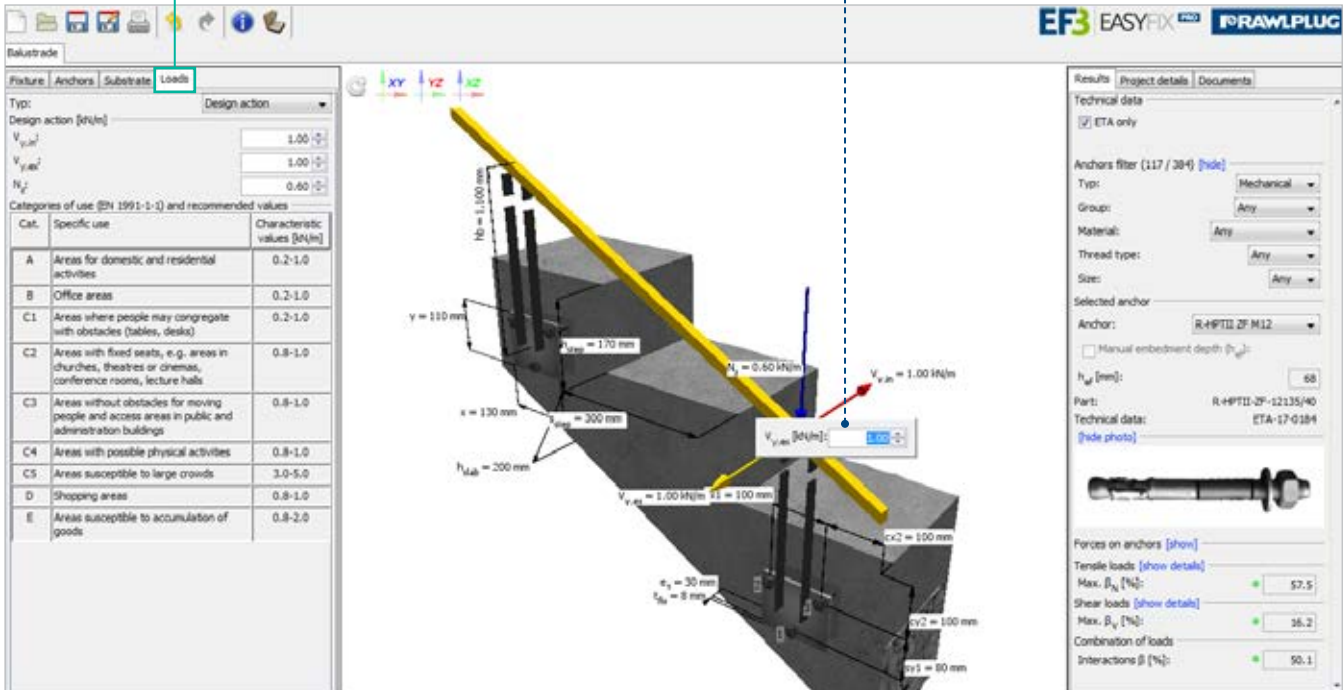
6. option to enter installation parameters



The Loads tabs contains the following features:

Loads

3. possibility to enter loads on the model



Fixture Anchors Substrate **Loads**

Typ: Design action

Design action [kN/m]

$V_{y,in}$: 1.00

$V_{y,ex}$: 1.00

N_z : 0.60

Categories of use (EN 1991-1-1) and recommended values

Cat.	Specific use	Characteristic values [kN/m]
A	Areas for domestic and residential activities	0.2-1.0
B	Office areas	0.2-1.0
C1	Areas where people may congregate with obstacles (tables, desks)	0.2-1.0
C2	Areas with fixed seats, e.g. areas in churches, theatres or cinemas, conference rooms, lecture halls	0.8-1.0
C3	Areas without obstacles for moving people and access areas in public and administration buildings	0.8-1.0
C4	Areas with possible physical activities	0.8-1.0
C5	Areas susceptible to large crowds	3.0-5.0
D	Shopping areas	0.8-1.0
E	Areas susceptible to accumulation of goods	0.8-2.0

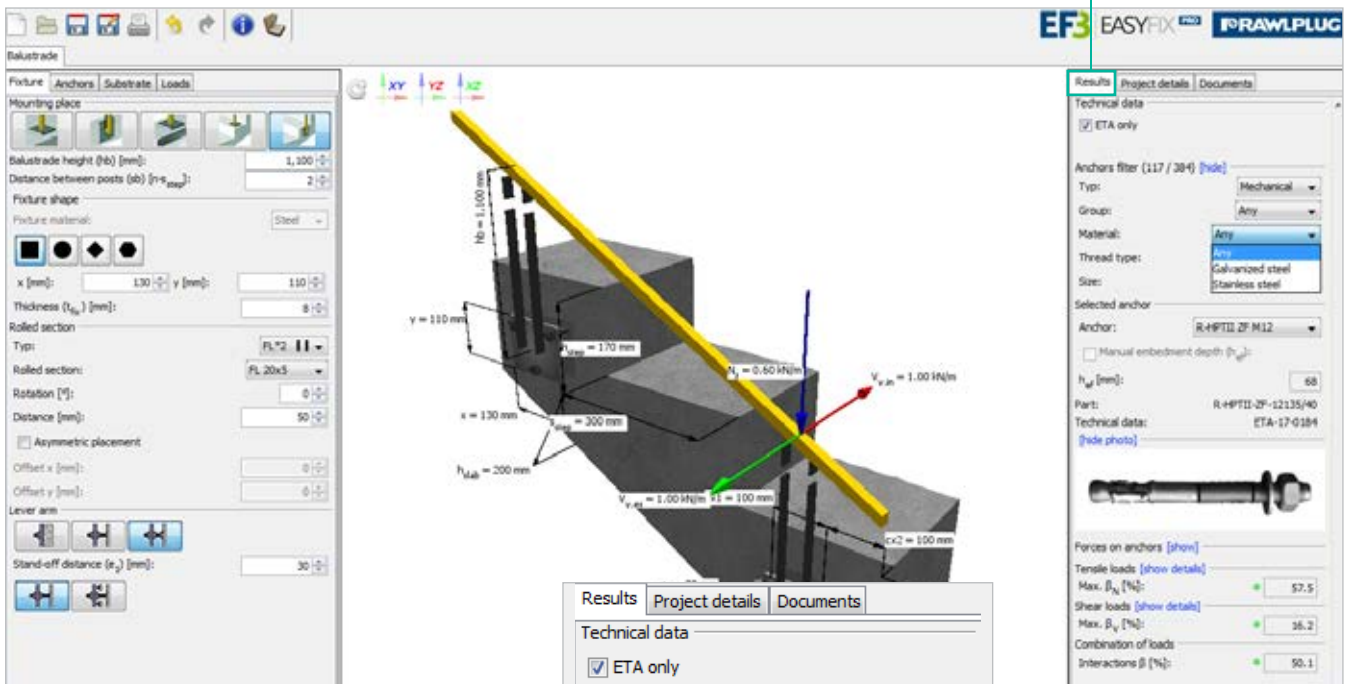
1. entering values for design and characteristic loads, depending on the choice, including the possibility to change safety factors against applicable standards

2. for improved ease of use, excerpt from the EN 1991-1-1 standard stating the characteristic loads for different use categories



The features available from the Results tab are as follows:

Results



1. filters making it easier to select anchors depending on their type, material and size

2. option define custom anchoring depth for bonded anchors

3. anchor choice and visualisation

4. option to display values of forces affecting each anchor and the neutral axis

5. option to display values of loads according to individual models of rupture

Results | Project details | Documents

Technical data

ETA only

Anchors filter (117 / 384) [hide]

Type: Mechanical

Group: Any

Material: Any

Thread type: Any

Size: Galvanized steel, Stainless steel

Selected anchor

Anchor: R-HPTII ZF M12

Manual embedment depth (h_{ef}):

h_{ef} [mm]: 68

Part: R-HPTII-ZF-12135/40

Technical data: ETA-17-0184

[hide photo]

Forces on anchors [show]

Tensile loads [show details]

Max. β_N [%]: 57.5

Shear loads [show details]

Max. β_V [%]: 16.2

Combination of loads

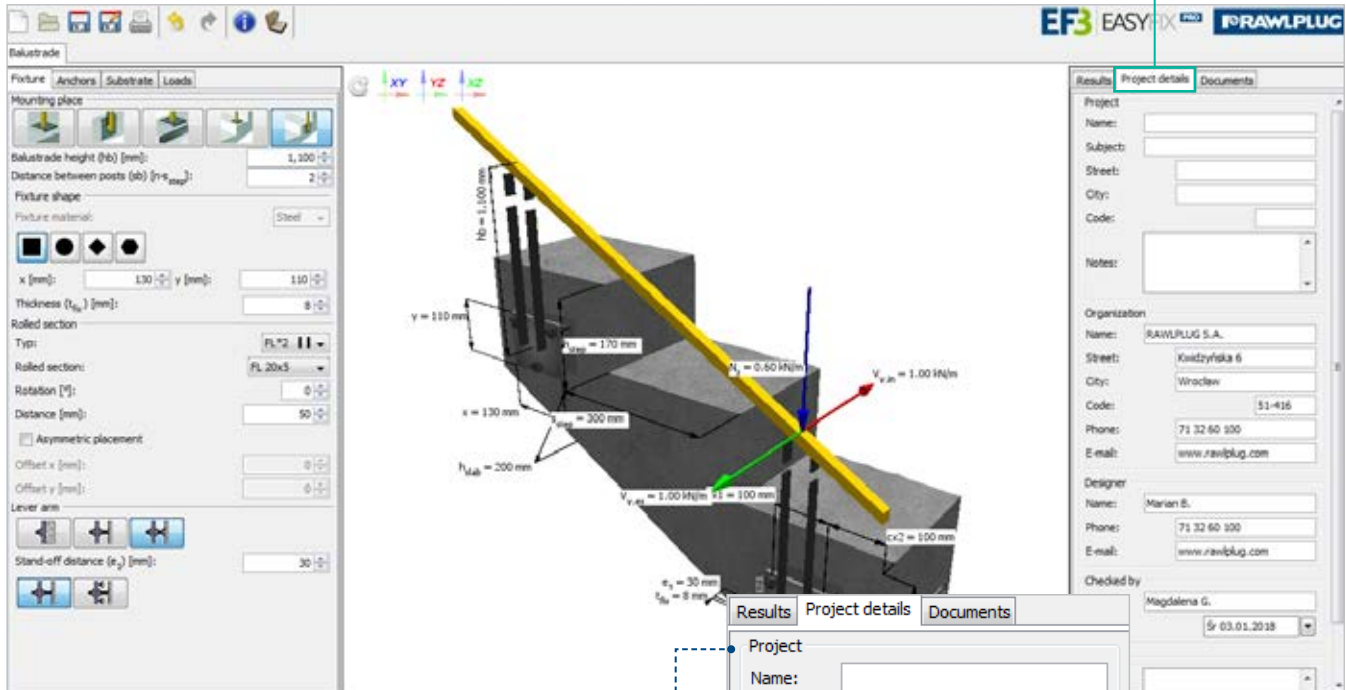
Interactions β [%]: 50.1

6. calculation results, including identification of their correctness or error



The Project Details tab allows the user to enter detailed data of the pending design project as well as of the engineering office.

Project details

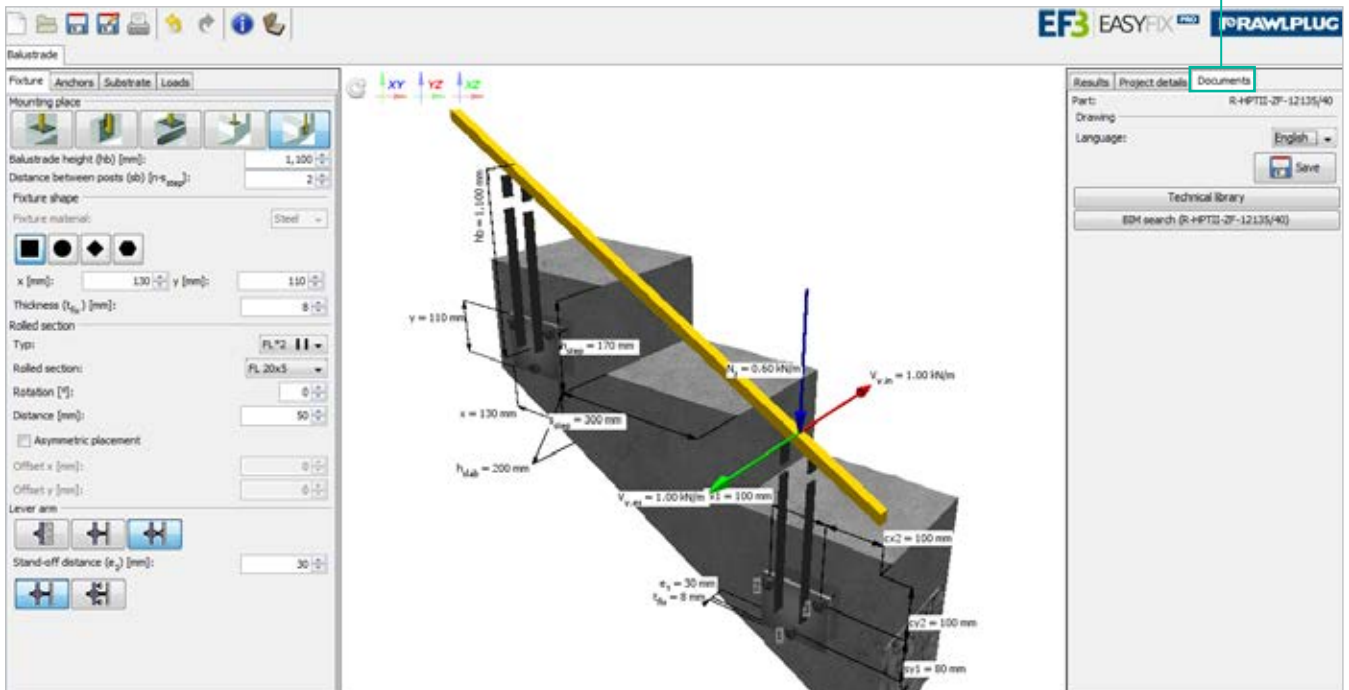


1. fields for entering data to identify: design project, engineering office location, designer, reviewer



The Documents tab allows the user to access a list of documents pertaining to the given fixing solution and download them.

Documents



User Manual

RABER module

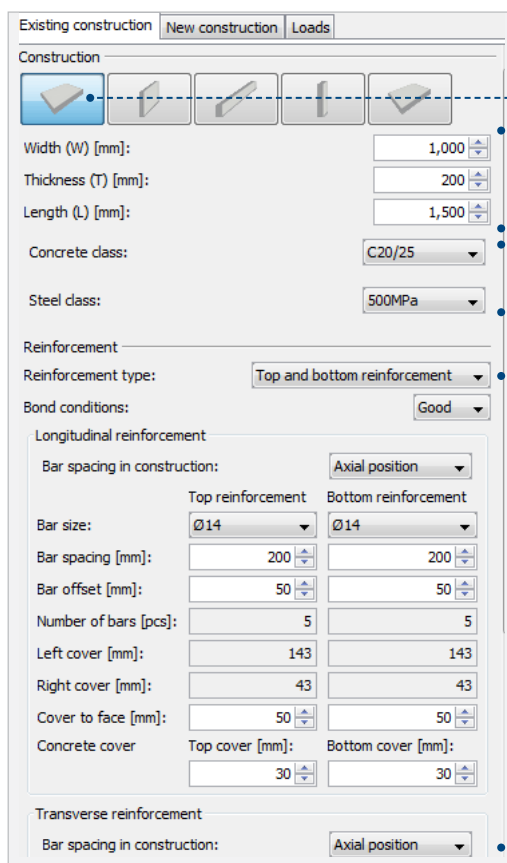
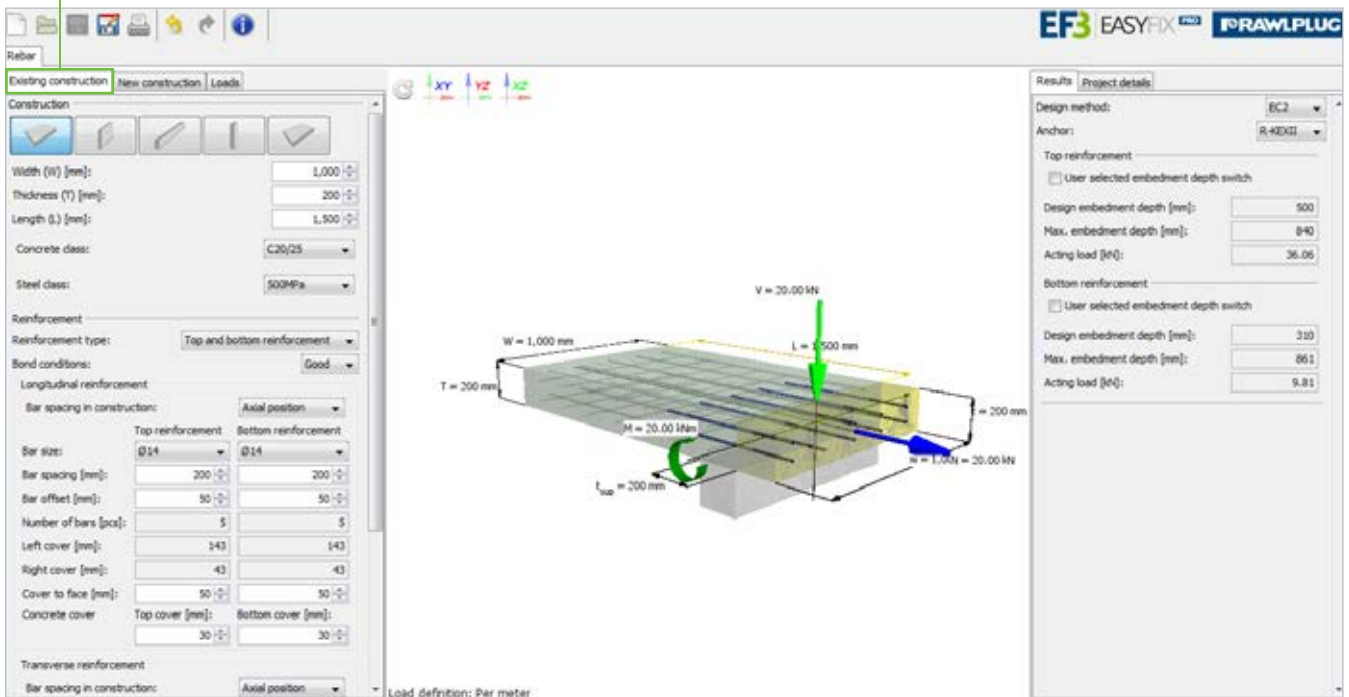
Easvfix

The REBAR module allows the user to design continuity reinforcements in an easy and intuitive manner, and in line with the EUROCODE 2 guidelines. The module comprises various default combinations of joints between the existing and the new reinforced concrete element planned to be built. What is more and truly unique about the module is that it enables you to calculate rebar anchoring depth using the proprietary REDM method, i.e. the Rawlplug Engineering Design Method, which allows designing of even the most highly specialised fixing configurations based on results of long years of research as well as Rawlplug's expertise and experience. Additionally, under mechanical calculations, the module verifies the mechanical strength of the reinforcement already installed by taking the newly defined loads into account, and detects collisions between the existing structure elements and the rebars designed to be installed. The application enables you to define loads per running metre, cross-section and individual rebar, but you can also calculate the maximum anchoring depth and reassure yourself about making the most of the available tensile strength of steel. You should also note that the data stored in the REBAR module comprise – similarly to all other EasyFix modules – tested products that hold relevant European Technical Assessments, and in this particular case, ones which comply with the EOTA TR-023 technical report.

The REBAR module contains the following tabs:
Existing construction, New construction, Loads, Results.

The Existing Construction tab is intended for entering all parameters of the structure on which the fixing is to be done in its current condition. You can define the following:

Existing construction



1. structure type, where the available options are: slab, wall, beam, column, foundation

2. dimensions characteristic of the chosen structure type

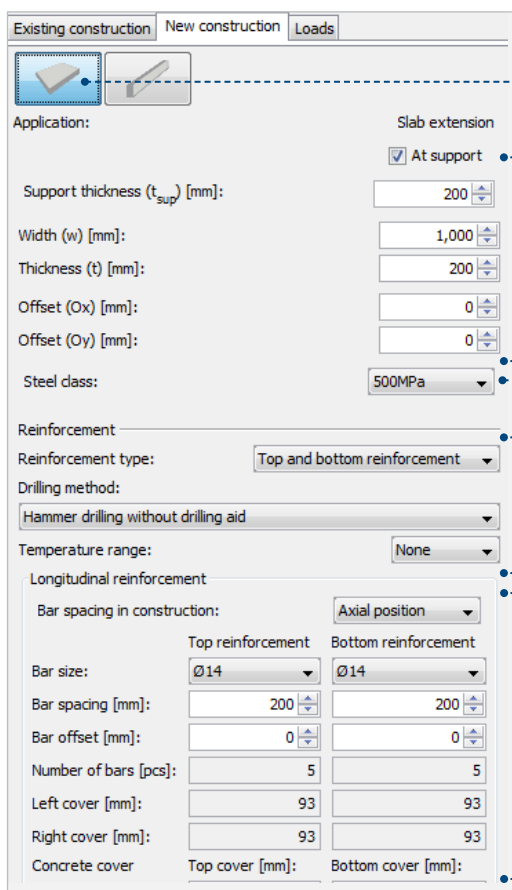
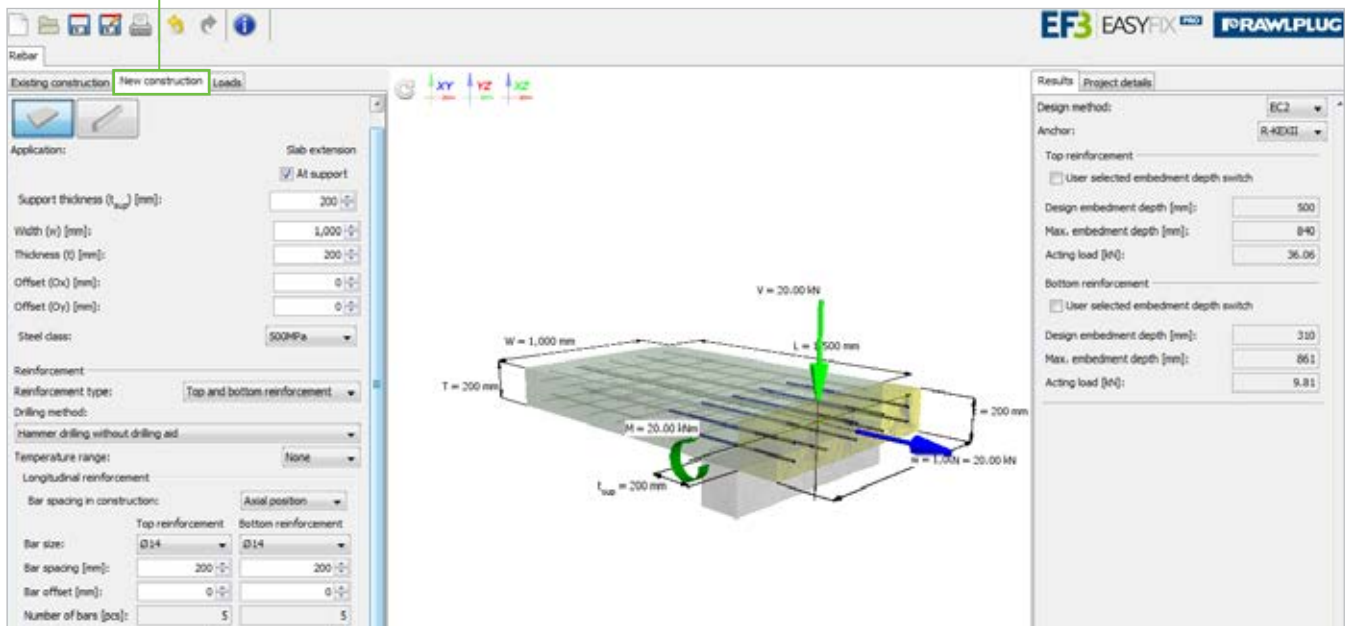
3. class of concrete and steel the structure is made of (options can be selected from a drop-down list or user-defined)

4. number, diameters and spacing of the existing reinforcement



The New Construction tab allow you to enter all parameters defining the structure on which the fixing is to be done in its current condition. You can define the following:

New Construction



1. type of the structure to be joined with the existing one; the number of available options is limited by the choice of the existing structure

2. dimensions characteristic of the chosen structure type

3. class of steel the new structure will be made of (options can be selected from a drop-down list or user-defined)

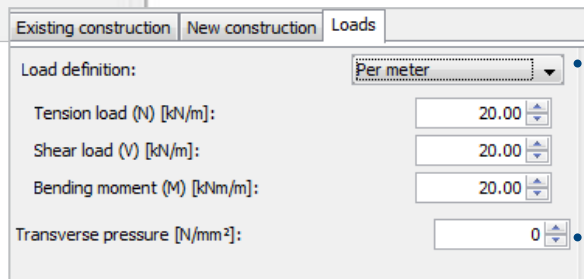
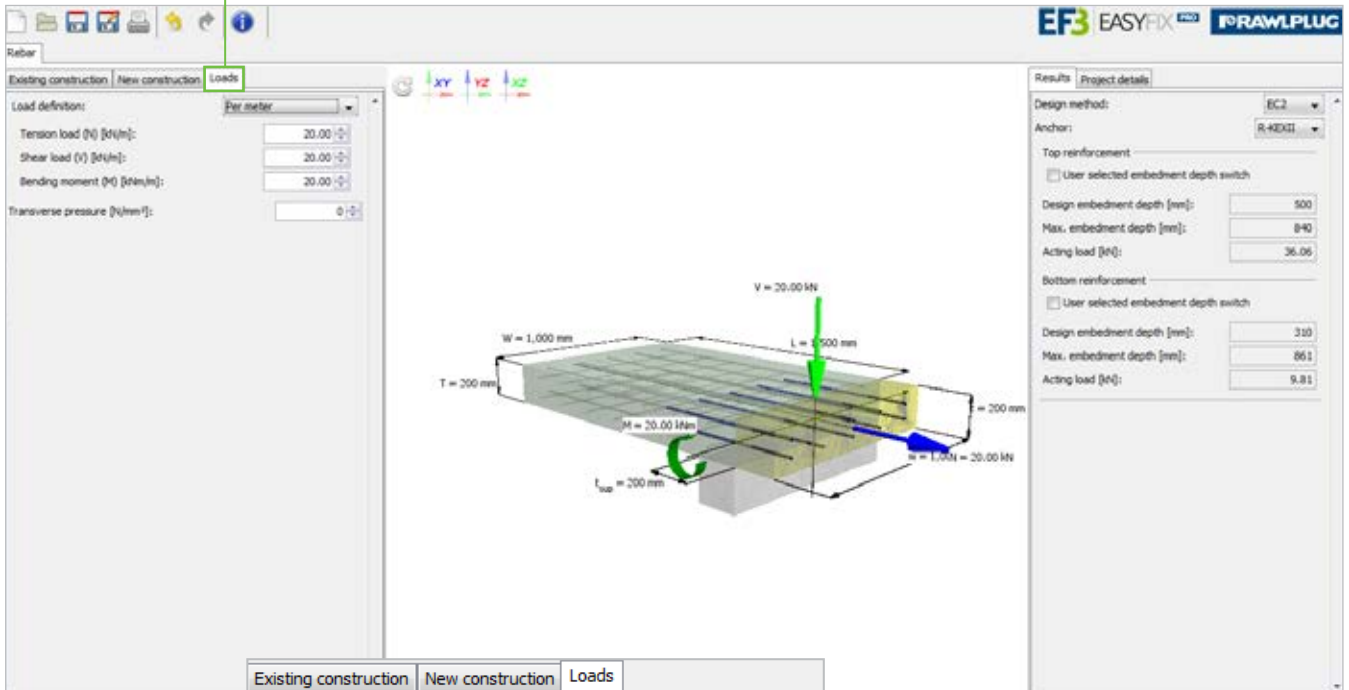
5. rebar installation parameters, including the method of drilling in the existing structure

4. number, diameters and spacing of the reinforcement being designed



The Loads tabs allows you to define the forces assumed to affect the joint. Force values can be entered *per bar* or *per section*, or you can calculate the joint's resistance to threshold tensile load of steel.

Loads

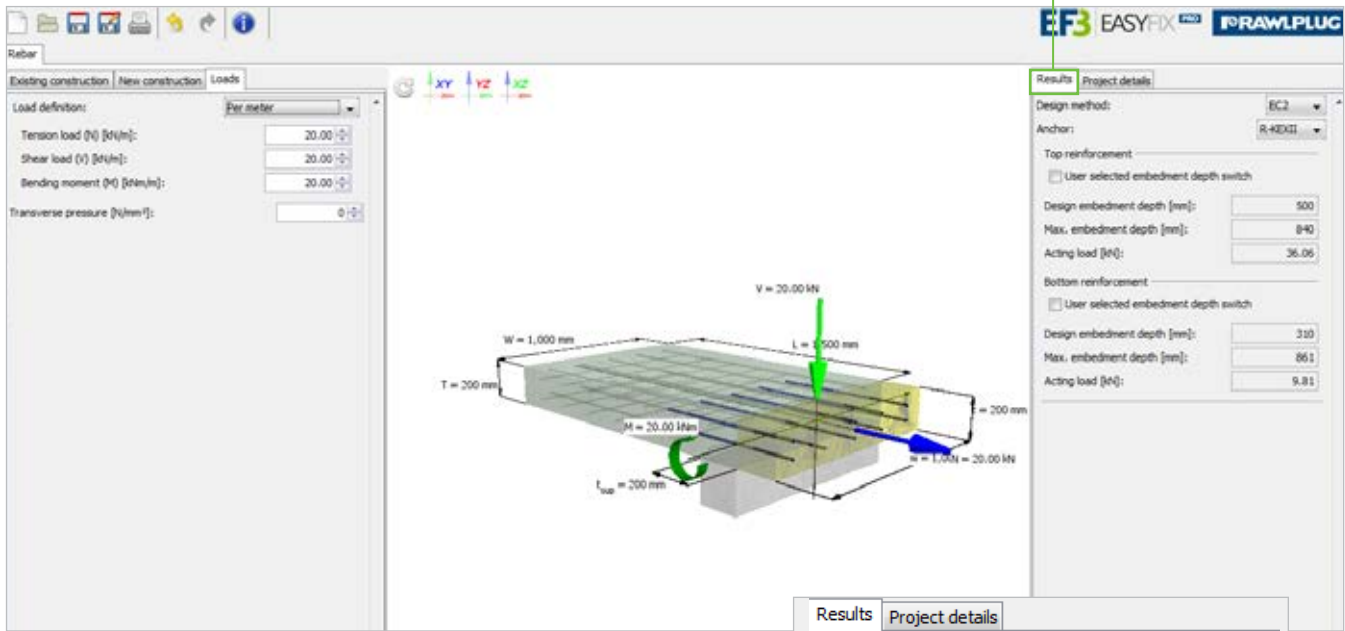


1. option to define loads and other forces



The Results tab shows the results obtained for the chosen variant.
This is also where you can choose:

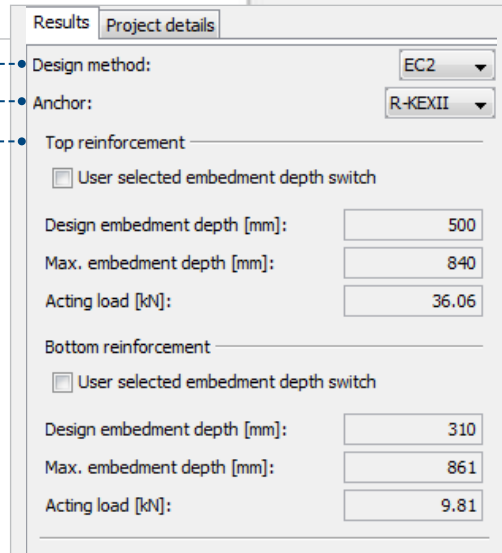
Results



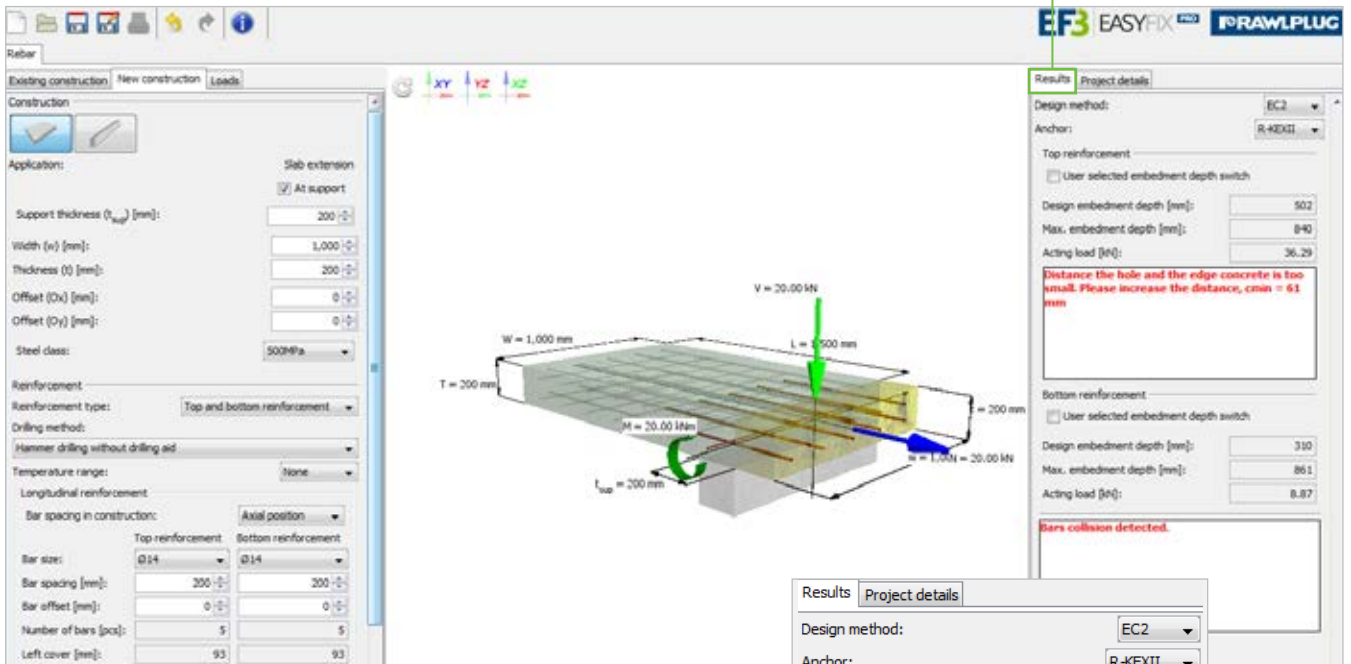
1. design method

2. type of resin to be used for anchoring

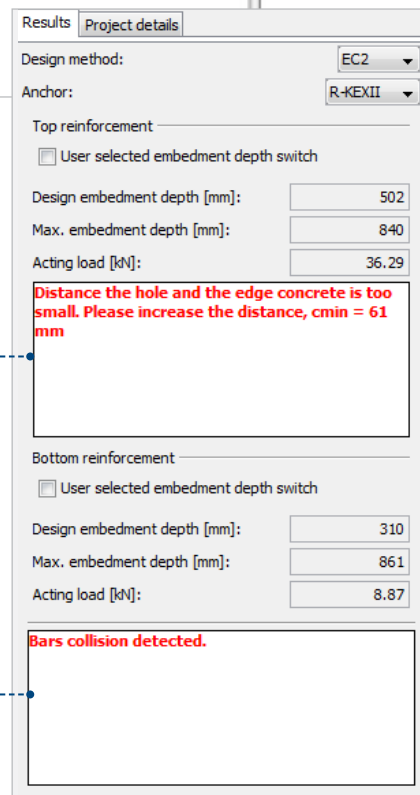
3. you can also run calculations by declaring custom rebar anchoring depth, whereupon the program will verify if the declared depth is sufficient for the pre-set parameters



Results



4. the tab additionally notifies you about having exceeded such parameters as steel load capacity, about the concrete cover depth being too small, or about collision between existing rebars and those to be anchored



User Manual

FLAT ROOF module

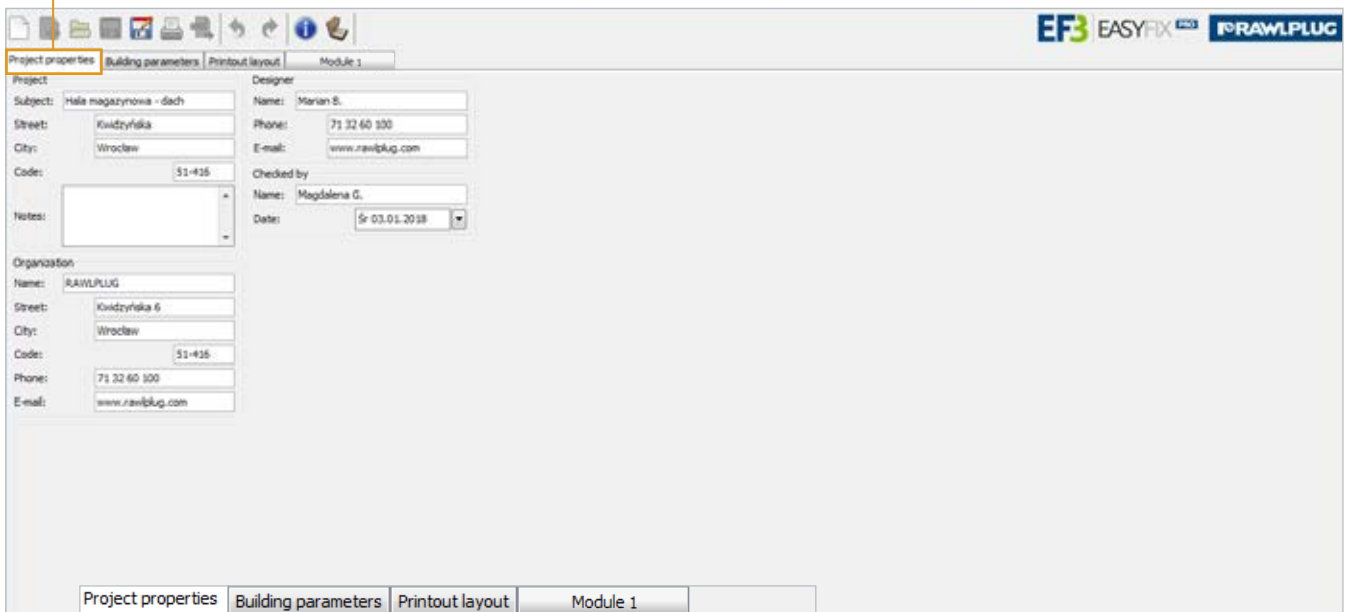
Easyfix

The FLAT ROOF module has been designed to enable making appropriate choices of fixings for insulation materials installed on flat roofs. The module relies on calculations conforming with the EN 1991-1-4 standard on wind actions as well as the ETAG 006 guidelines. It is absolutely crucial that results of calculations are very precise in terms of both the number and length of fixings. Such precision would not be possible to attain without the wide selection of options enabling characteristic design data to be entered and changed as well as without other application features, such as the possibility to define the roof surface profile or the substrate to which thermal and hydro-insulation materials are to be fixed. It should be noted that the software version available to every EasyFix user is basic in the scope covered by the FLAT ROOF module, matching the most common design scenarios. However, if you need to perform calculations for a very specific and complicated concept, just contact Rawlplug's Technical Department via the rawlplug.com website, and our experts will support you using a more advanced program version. What they can do includes calculations with variable insulation thickness or defining oval roof edges.

The FLAT ROOF module contains the following tabs: Project properties, Building parameters, Roof.

The Project Properties tab enables you to enter detailed information about the given project.

Project properties



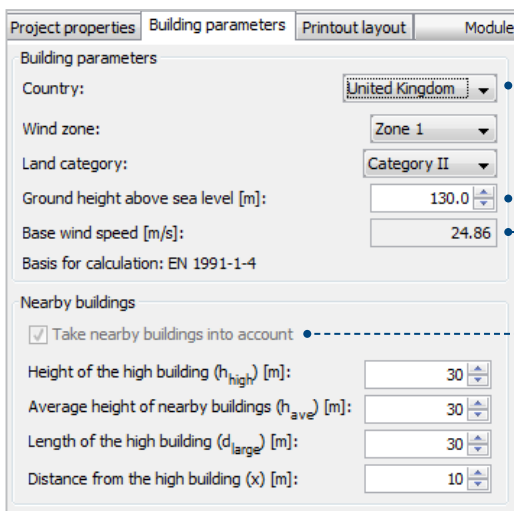
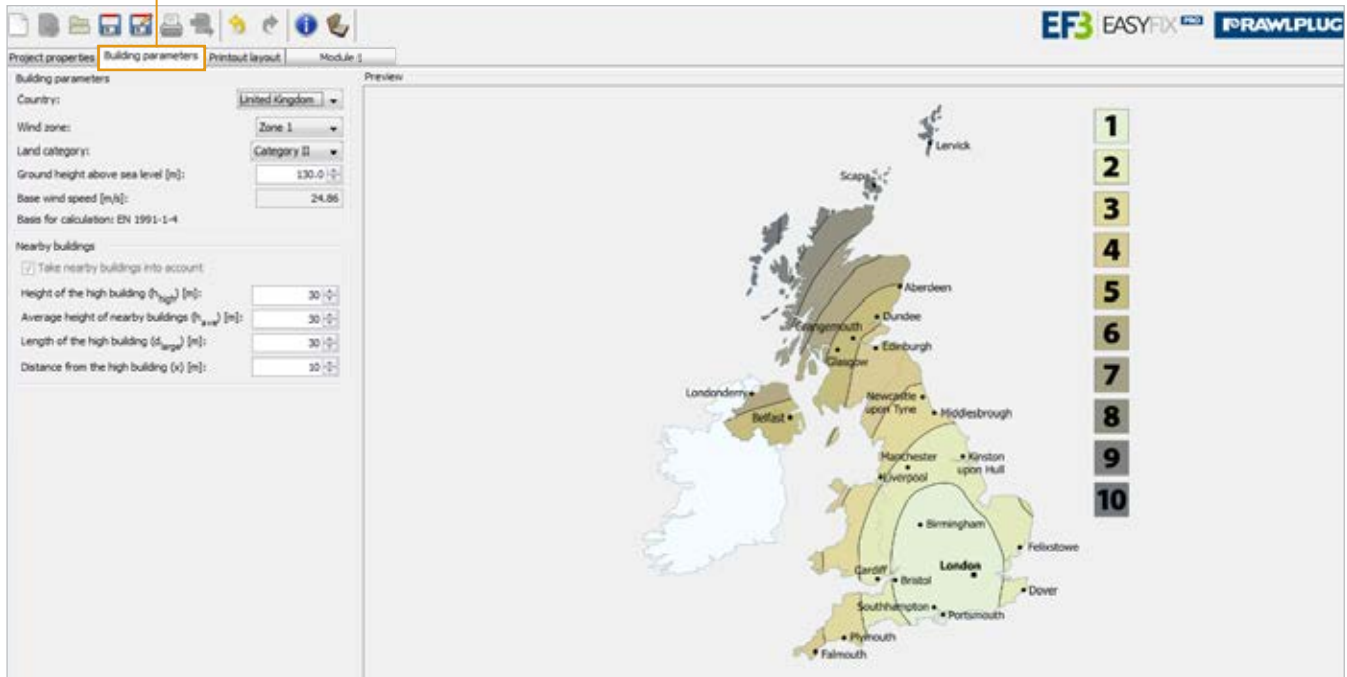
Project properties	Building parameters	Printout layout	Module 1
Project			
Subject:	Hala magazynowa - dach		
Street:	Kwidzyńska		
City:	Wrocław		
Code:	51-416		
Notes:	<div style="border: 1px solid gray; height: 20px;"></div>		
Designer			
Name:	Marian B.		
Phone:	71 32 60 100		
E-mail:	www.rawlplug.com		
Checked by			
Name:	Magdalena G.		
Date:	Śr 03.01.2018		
Organization			
Name:	RAWLPLUG		
Street:	Kwidzyńska 6		
City:	Wrocław		
Code:	51-416		
Phone:	71 32 60 100		
E-mail:	www.rawlplug.com		

1. fields for entering data to identify: design project, engineering office location, designer, reviewer



The Building Parameters tab features the following options:

Building parameters



- 1. selection of basic parameters that identify the building location, i.e. country, height above sea level and land category or wind zone
- 2. option to define base wind speed for locations which are not available by default in the application for specific reasons
- 3. possibility to take the impact of nearby (tall) buildings into account on the roof designed



The Roof (Module) tab groups the available features into four subtabs: Module Parameters, Roof Outline, Slopes and Roof Parameters.

The screenshot shows the software interface with the 'Roof (Module)' tab selected. The 'Module parameters' subtab is active, displaying the following fields:

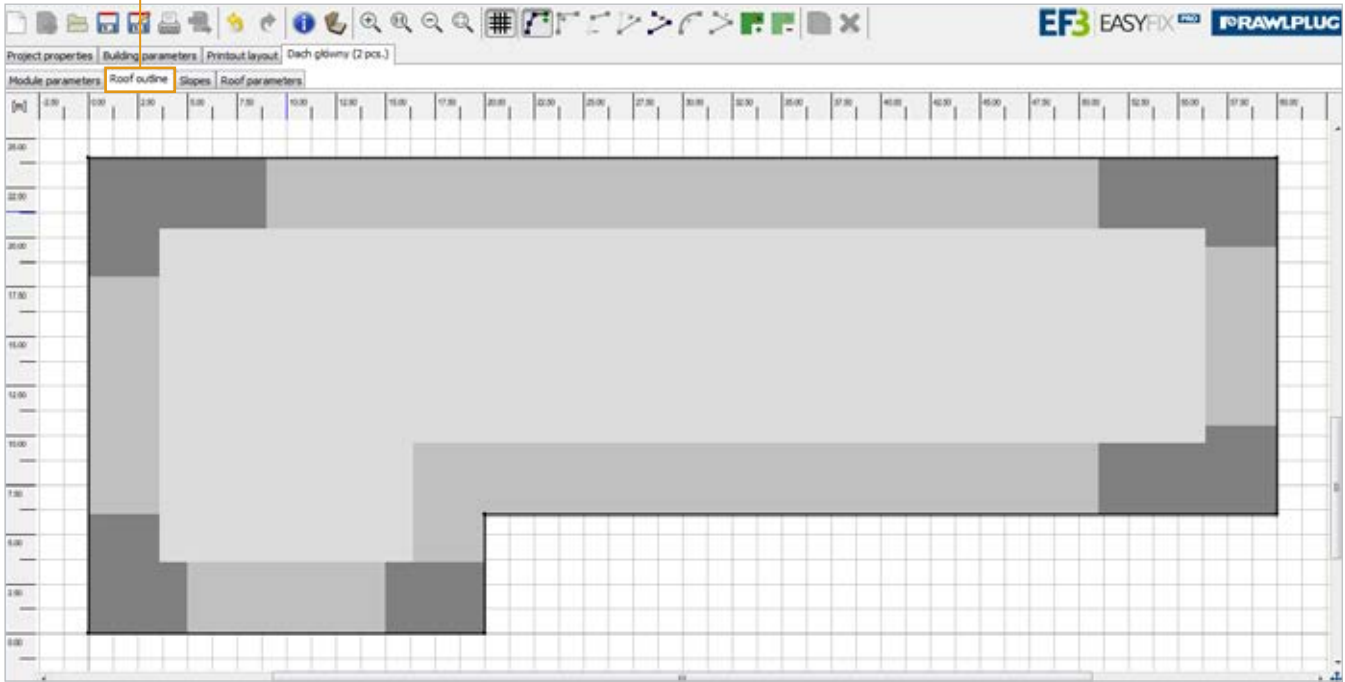
- Basic parameters:**
 - Name: Dach główny
 - Comment: [Text area]
 - Quantity: 2
- Roof parameters:**
 - Roof height above ground level [m]: 18.0
 - Roof type: With parapets
 - Height of the parapet [m]: 0.25
- Internal pressure:**
 - $c_{p,i}$: -0.31
 - Include internal pressure
 - According to: EN 1991-1-4 p. 7.2.9 without a dominant face
- Calculated wind pressure:**
 - Corner zone [N]: -3,513
 - Outer border zone [N]: -2,580
 - Inner border zone [N]: -1,577
 - Inner zone [N]: -799

A callout box points to the 'Module parameters' subtab with the following text:

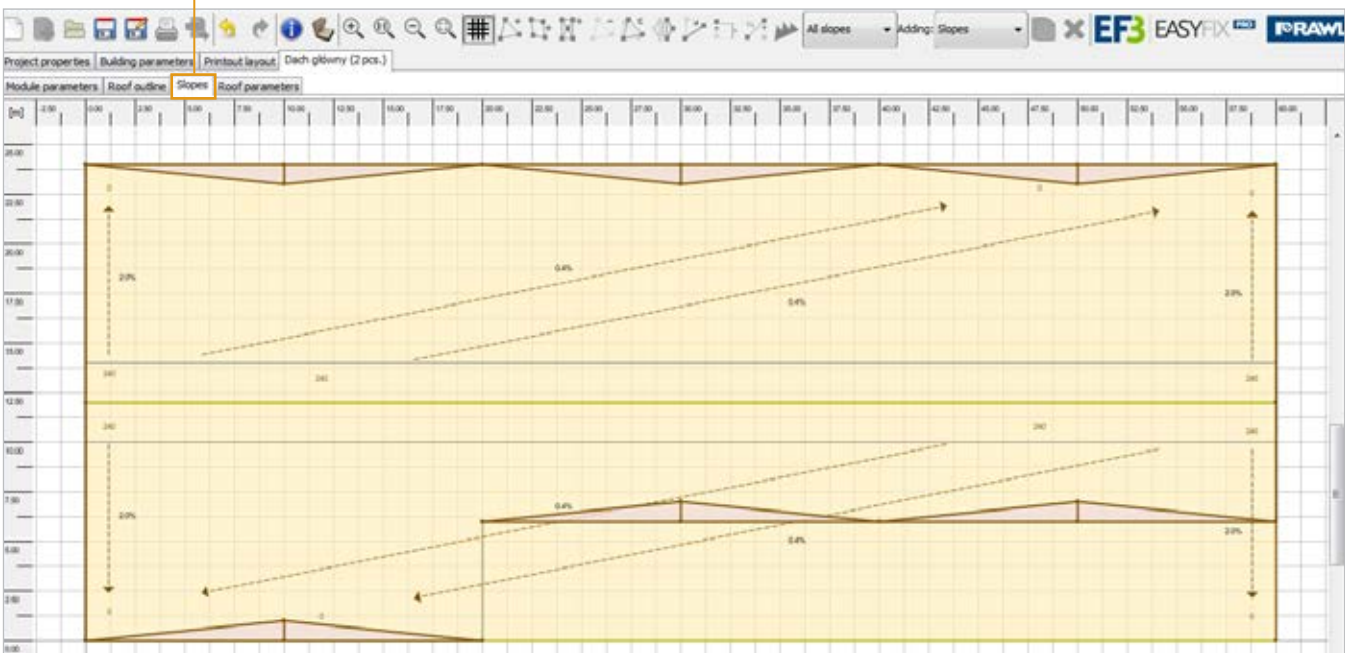
1. this is where you can change the model name, define the roof height above ground level, select the roof edge type, check a box to take internal pressure into consideration in calculations and access results of wind pressure calculations for each roof zone



Roof outline is where you can enter the outline of the roof being designed using various drawing functions.



The Slopes tab allows you to enter slopes and counterslopes to be developed with insulation material of variable thickness (feature available upon submitting a design to Rawlplug's Technical Department).

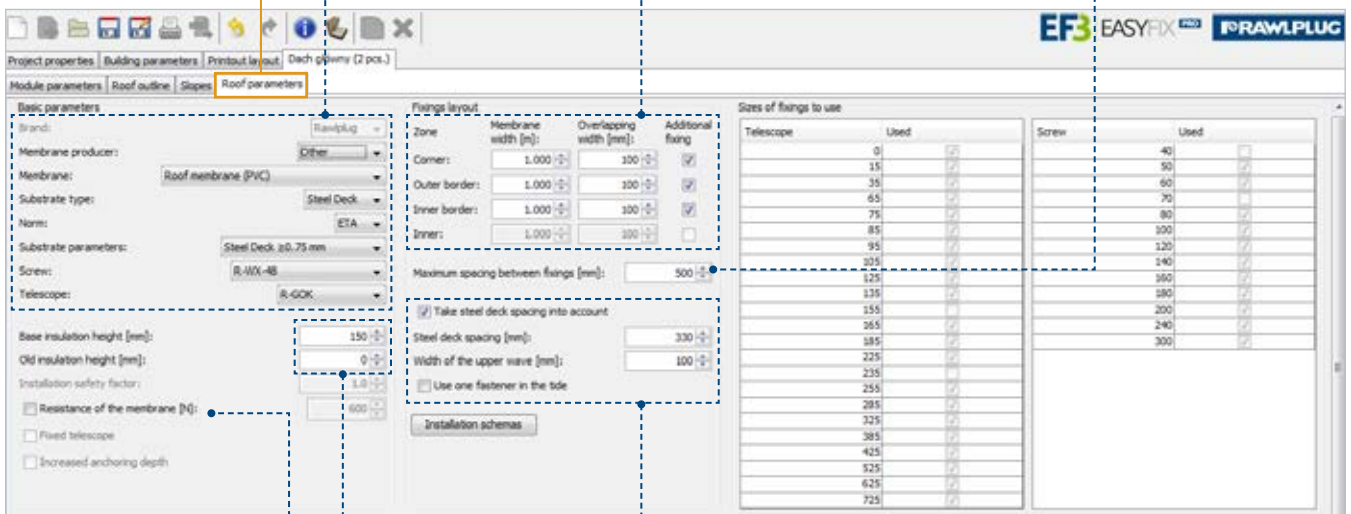


Roof Parameters is a tab that provides the user with the following selection of features:

1. choice of hydro-insulation, substrate and fixing type

4. option to define the membrane and overlap width for the given roof zone, with additional fixing available

5. option to define maximum spacing between fixings



3. option to declare membrane load capacity, if it is relevant

2. option to define base insulation height and old insulation height

6. option to enter sheet dimensions to be taken into account in spacing calculations for roofing made of steel decking

Calculated values					Quantities of fixings (5319 total)			
Fixing depth of the screw:				15	Telescope	Quantity	Screw	Quantity
Design resistance of the elements (ETA-09/0346/2012) [kN]:				505	135	493	50	335
Zone	Area [m ²]	Density of fixings [pcs./m ²]	Number of fixings [pcs.]	Spacing (l) [mm]	165	525	60	1011
Corner:	156.96	7.02	1,102	330.00	185	887	80	2640
Outer border:	396.00	5.13	2,033	330.00	225	610	100	1222
Inner border:	647.04	3.38	2,184	330.00	255	963	120	1098
Total	1,200.00	4.43	5,319	-	325	538		

7. displaying calculation results for screw anchoring depth, load capacity of fixings, surface area of zones, density and number of fixings per zone

8. displaying the chosen set of fixings along with their number



User Manual

FACADE module

easyfix

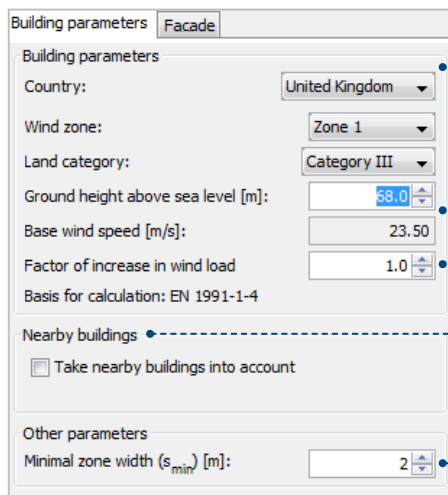
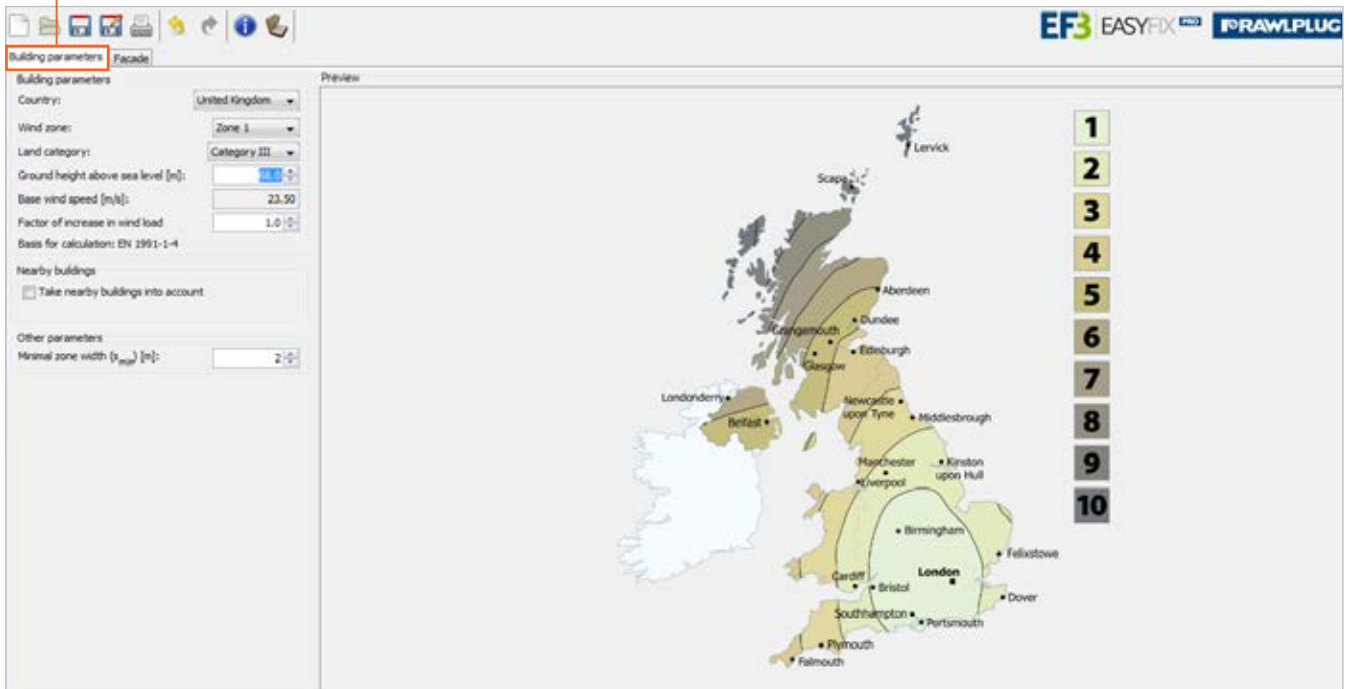
The FACADE module of Rawlplug's EasyFix application is dedicated to calculations aimed at making the most appropriate choice of mechanical fixings for the ETICS wall insulation systems, i.e. lightweight and wet systems, for both masonry and concrete walls. What seems particularly important is that the calculations performed in EasyFix always conform with the EN 1991-1-4 standard on wind actions, and that specific fixing solutions are selected with regard to the ETAG 014 guidelines. However, the primary function of the FACADE module is to enable you to make a model-based choice of the type and number of mechanical fixings for individual wind zones, so that the given project can ultimately be implemented with the focus on utmost efficiency and durability supported by optimisation of installation costs.

The FACADE module contains the following tabs:
Location, Building, Insulation, Fixings and Project details.

EASYFIX

The Location tab features the following items:

Building parameters



1. parameters defining the building location, including country, wind zone, land category and height above sea level

2. option to increase wind load by defining a factor

3. possibility to take the impact of nearby buildings into account by defining their characteristic dimensions

4. possibility to set minimum wind zone width



The Building tab features the following options:

Building

4. possibility to rotate the model display and return to original view

5. option to enter data on the model by clicking dimension lines

9. determination of exact percentage share of area attributed to holes by defining dimensions and number of windows

1. substrate choice, both in terms of type and material

2. choice of building shape

3. option to define north orientation (if necessary)

6. option to enter building height

7. possibility to exclude individual walls from direct wind force effect, whereupon the given wall is disregarded in calculation of the total number of fixings

8. defining the share of surface area attributed to holes in per cent

Procent otworów

Tryb	Procent otworów [%]:			
Rozbudowany	10			
	Ilość [szt.]	X [m]	Y [m]	Powierzchnia [m]
Okno Typ 1:	50	1,5	1,2	90,00
Okno Typ 2:	50	1,0	1,2	60,00
Okno Typ 3:	100	0,8	1,2	96,00
Okno Typ 4:	50	0,6	0,6	18,00
Okno Typ 5:	100	1,2	1,2	144,00
Okno Typ 6:	50	1,1	1,2	66,00
Okno Typ 7:	50	0,9	1,2	54,00
Okno Typ 8:	0	0,0	0,0	0,00
Suma:				528,00
Procent otworów [%]				22,00

Building parameters

Substrate group: Type C - Hollow Brick

Substrate: Vertically perforated clay bricks Hz 12MPa

Shape of the building: [Icons]

North orientation [°]: -45

Height of building (h) [m]: 30.0

Name	Length [m]	Windward	Off the wall	Holes ratio
x1:	80.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22 %
x2:	50.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
x3:	20.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
x4:	50.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
x5:	40.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
x6:	100.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
y1:	12.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
y2:	10.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
y3:	15.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
y4:	15.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %
y5:	10.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 %

The Insulation tab allows the user to access the following features:

1. possibility to choose insulation layout

2. where homogeneous layout has been selected:

2.1 option to choose insulation type (either polystyrene or stone wool), insulation system and specific polystyrene or wool type

2.2 checkbox that enables pull-through force to be taken into consideration in calculations, if required (for the BSO systems implemented in the program, the relevant values are automatically taken into account as per reference documents)

2.3 option to enter insulation thickness

2.4 checkbox option to select countersunk installation

2.5 option to define thickness of adhesive and old insulation material

Insulation

Building parameters | Facade

Building | **Insulation**

Insulation layout: Homogeneous

Single insulation

Insulation type: MW (EN 13162)

Insulation system: Any

Insulation: MW (TR 7,5, $\rho \geq 80 \text{ kg/m}^3$)

Consider the pull-through:

Pull-through of insulation ($F_{Rk,p}$) [kN]: 0.30

Safety factor v_m : 2.0

Base insulation thickness (G_b) [mm]: 200

Mounted countersunk:

Adhesive thickness (G_a) [mm]: 10

Old insulation thickness (G_{old}) [mm]: 0

Fixings | Project details

Fixings filter

Brand: Rawlplug

Fixing type: TFX-8H

Insulation retaining plate: None

Result

Fixing: TFX-8H-235

Forces occurring in the zone [kN/m²]:

Height [m]	Zone A	Zone B	Zone C
20.0 - 30.0	-1.510	-1.007	-0.629
10.0 - 20.0	-1.329	-0.886	-0.554
0.0 - 10.0	-1.041	-0.694	-0.434

Average quantity of fixings in the zone [pcs./m²]:

Height [m]	Zone A	Zone B	Zone C
20.0 - 30.0	10.1	6.7	6.0
10.0 - 20.0	8.9	6.0	6.0
0.0 - 10.0	6.9	6.0	6.0

Fixings count [pcs.]:

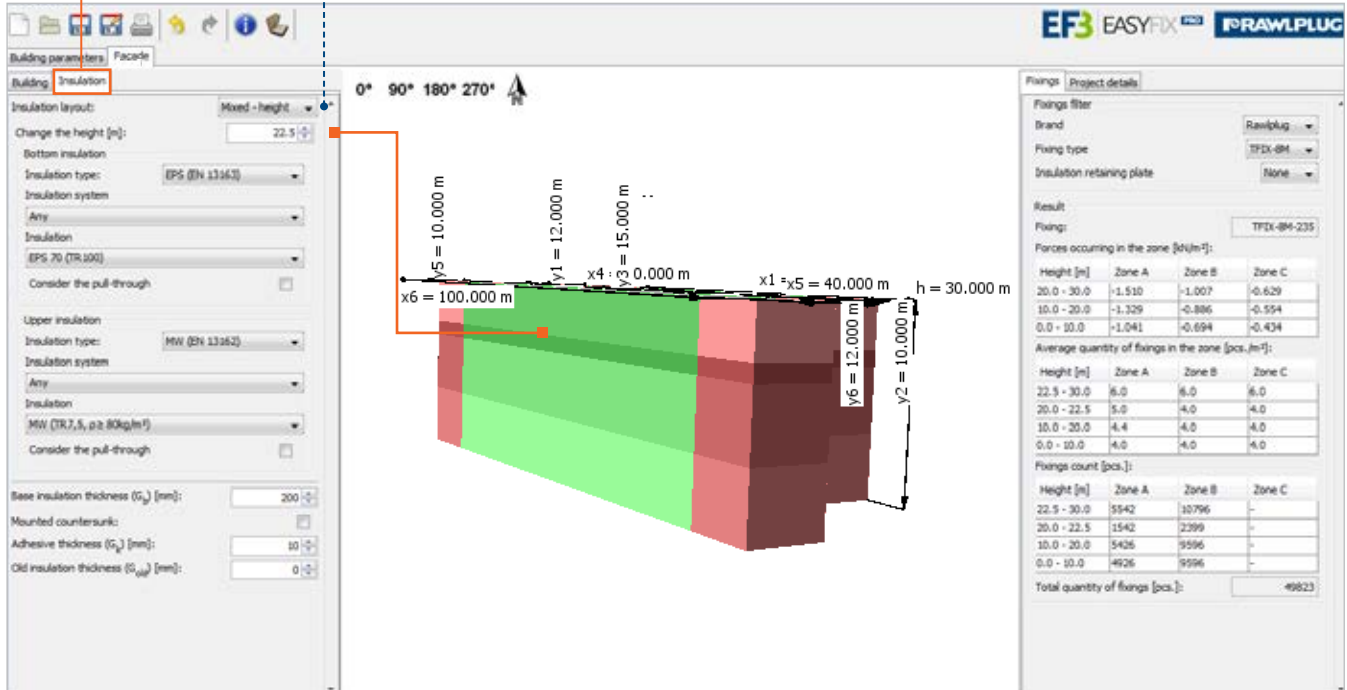
Height [m]	Zone A	Zone B	Zone C
20.0 - 30.0	12440	16076	-
10.0 - 20.0	10966	14393	-
0.0 - 10.0	8502	14393	-

Total quantity of fixings [pcs.]: 76770



Insulation

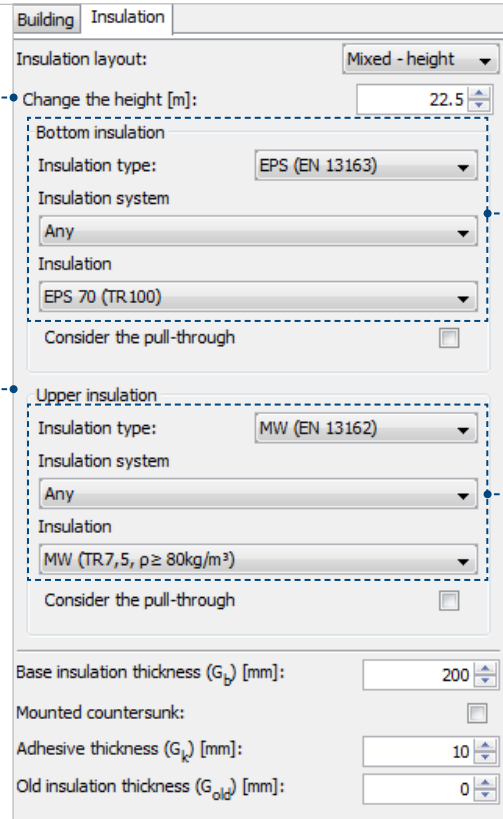
having chosen mixed insulation, you can additionally:



3.1 define two insulation types independently

3.3 define the height at which to change insulation material

3.2 enter characteristic parameters for the given type



Insulation

having chosen mixed insulation, you can additionally:

The screenshot shows the 'Insulation' tab in the EASYFIX software. On the left, there are two sections for 'Isolacja podstawowa' and 'Pas izolacji', both set to 'Mixed - belts'. The 'Isolacja podstawowa' section includes parameters for 'Typ izolacji' (EPS EN 13163), 'System izolacji' (Dowolny), 'Izolacja' (EPS 70 (TR100)), and 'Wielkość pasów' (1.0, 5.0, 10.0). The 'Pas izolacji' section includes parameters for 'Typ izolacji' (MW EN 13162), 'System izolacji' (Dowolny), 'Izolacja' (MW (TR7,5, ρ ≥ 80kg/m³)), and 'Wielkość pasów' (1.0, 5.0, 10.0). The 3D model shows a wall section with a height of 30.000 m and a width of 100.000 m. The insulation is applied in a mixed-belt system with belts of width 1.0 m, spaced every 5.0 m, and a first belt of 10.0 m. The belts are labeled with dimensions: y5 = 10.000 m, y1 = 12.000 m, x4 = 0.000 m, x3 = 15.000 m, x1 = x5 = 40.000 m, y6 = 12.000 m, and y2 = 10.000 m. On the right, there are tables for 'Wynik' (Result) and 'Łącznik' (Connector) showing fire resistance data for different heights and zones (Strefa A, B, C).

Building Insulation

Insulation layout: **Mixed - belts**

Width of the belt [m]: 1.0

Belt every [m]: 5.0

First belt [m]: 10.0

Basic insulation

Insulation type: EPS (EN 13163)

Insulation system: Any

Insulation: EPS 70 (TR100)

Consider the pull-through:

Isolation belt

Insulation type: MW (EN 13162)

Insulation system: Any

Insulation: MW (TR7,5, ρ ≥ 80kg/m³)

Consider the pull-through:

Base insulation thickness (G_p) [mm]: 200

Mounted countersunk:

Adhesive thickness (G_a) [mm]: 10

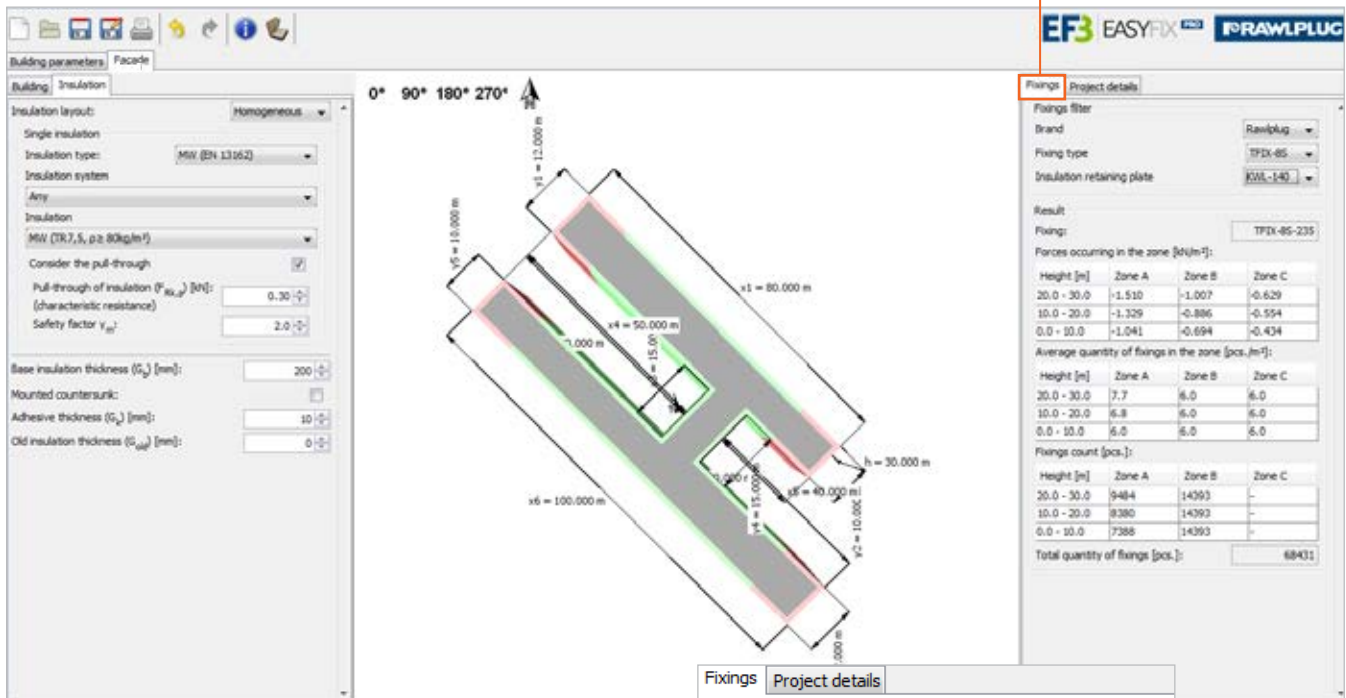
Old insulation thickness (G_{old}) [mm]: 0

3.4 define belt dimensions, spacing and height of the first belt, for systems with fire protection belts



In the Fixings tab, you can:

Fixings



1. select fixing type
2. add retaining plate
3. display results for the chosen fixing
4. calculate forces acting in individual zones at different building heights
5. display minimum number of fixings per zone (pcs./m²) at the given building height
6. display overall number of fixings in individual zones at different building heights as well as total quantity of fixings required

Fixings Project details

Fixings filter

Brand: Rawplug

Fixing type: TFIX-8S

Insulation retaining plate: KWL-140

Result

Fixing: TFIX-8S-235

Forces occurring in the zone [kN/m²]:

Height [m]	Zone A	Zone B	Zone C
20.0 - 30.0	-1.510	-1.007	-0.629
10.0 - 20.0	-1.329	-0.886	-0.554
0.0 - 10.0	-1.041	-0.694	-0.434

Average quantity of fixings in the zone [pcs./m²]:

Height [m]	Zone A	Zone B	Zone C
20.0 - 30.0	7.7	6.0	6.0
10.0 - 20.0	6.8	6.0	6.0
0.0 - 10.0	6.0	6.0	6.0

Fixings count [pcs.]:

Height [m]	Zone A	Zone B	Zone C
20.0 - 30.0	9484	14393	-
10.0 - 20.0	8380	14393	-
0.0 - 10.0	7388	14393	-

Total quantity of fixings [pcs.]: 68431



The Project Details tab allows the user to enter detailed data of the pending design project as well as of the engineering office.

Project properties

The screenshot displays the 'Project Properties' tab in the software. The central area shows a 3D model of a building facade with dimensions: $x_1 = 80.000\text{ m}$, $x_2 = 15.000\text{ m}$, $x_3 = 15.000\text{ m}$, $x_4 = 50.000\text{ m}$, $x_5 = 10.000\text{ m}$, and $h = 30.000\text{ m}$. The left sidebar contains 'Building parameters' for 'Insulation', including 'Insulation layout: Homogeneous', 'Insulation type: MW (EN 13162)', 'Insulation system: Any', 'Insulation: MW (TR7,5, $\rho \geq 80\text{ kg/m}^3$)', 'Consider the pull-through: checked', 'Pull-through of insulation ($F_{0,0,2}$) [kN]: 0.30', 'Safety factor $v_{0,2}$: 2.0', 'Base insulation thickness (G_b) [mm]: 200', 'Mounted countersunk: unchecked', 'Adhesive thickness (G_a) [mm]: 30', and 'Old insulation thickness (G_{old}) [mm]: 0'. The right sidebar shows 'Project details' with fields for Name, Subject, Street, City, Code, Notes, Organization, Designer, and Checked by. A callout box highlights the 'Project details' section, which contains the following data:

Field	Value
Name	Budynek mieszkalny
Subject	Mocowanie izolacji fasadowej
Street	Kwidzyńska 6
City	Wrocław
Code	51-416
Notes	
Organization Name	Rawlplug S.A.
Organization Street	Kwidzyńska 6
Organization City	Wrocław
Organization Code	51-416
Organization Phone	71 32 60 100
Organization E-mail	www.rawlplug.com
Designer Name	Marian B.
Designer Phone	71 32 60 100
Designer E-mail	www.rawlplug.com
Checked by Name	Magdalena G.
Checked by Date	Śr 03.01.2018

1. fields for entering data to identify: design project, engineering office location, designer, reviewer



EasyFix