





# New Features

# STRAKON 2020



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# Installation Instructions

## Important Information

### Discontinuation of the 32-Bit Version of STRAKON 2020

Ongoing development of the 32-Bit version will be discontinued from the version STRAKON 2020 (December 2019). Only the 64-Bit version of STRAKON for Windows will then remain available.

### Directory Synchronization

Please note that for directory synchronization applications, for example, roaming profiles etc., you must close both STRAKON and all drawings which are open in order to avoid any loss of data. Alternatively, exempt the STRAKON user directory **Version.2020** from the synchronization if you always wish to close STRAKON with drawings open.

### System Requirements for the Installation

64-Bit operating system: Windows 8/8.1, Windows 10  
Screen resolution: 1920 x 1080 pixels (recommended)  
min. OpenGL Version 3.2

If the set-up program cannot find the **runtime libraries for Visual C++ 2015**, it will offer to install them and you will have to perform this installation as a **User with Administrator Rights**.

### Important Changes for Installation

Separate installation now takes place independently of any later STRAKON users, i.e. it can be carried out from an **administrator account**. For the installation of user data please choose whether it should be carried out separately for every user or for all users.

#### User data separately for every user

After the installation of the program data, on the first start of STRAKON by a user, the user data are subsequently automatically installed for the relevant **user account** as part of the initial setup. This process does not demand any administrator rights for a user.

#### User data for all users

The program data including user data are installed during the installation. Later, all STRAKON users have access to the common user data via their user account.

Should STRAKON only be required for one user on the computer, the installation may also be carried out directly from his user account, however with administrator rights.

An installation with a user-defined installation path is no longer supported.

#### Installation paths

Program data (*.exe, *.dlls):	C:\Program Files\DICAD\Version.2020
User data separately:	C:\Users\<USERNAME>\AppData\Roaming\DICAD\Version.2020
User data for everyone:	C:\ProgramData\DICAD\Version.2020

#### Program group DICAD 2020

Irrespective of the chosen form of installation, the program group **DICAD 2020** is available to every user with all entries in the Windows start menu.

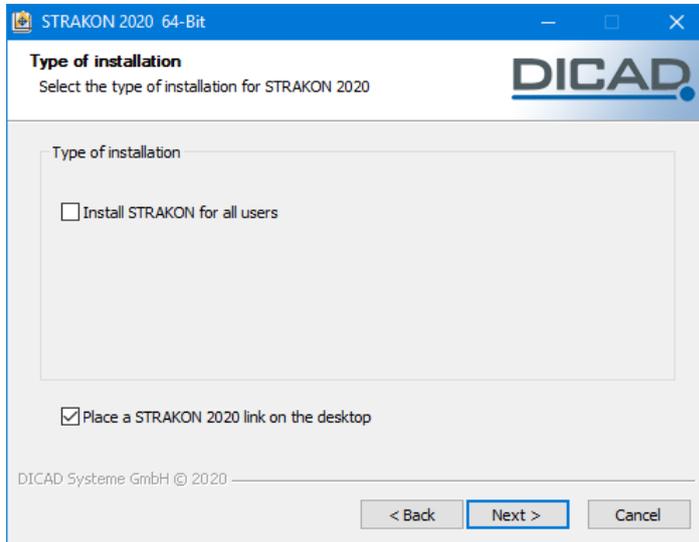
#### Requirement for an Update:

Updates are only possible for the same STRAKON Bit versions and the same choice of installed user data.

## Installation

Start the installation by clicking on **setup.exe** and choose the language version to be installed (selection appears in the case of an initial and parallel installation).

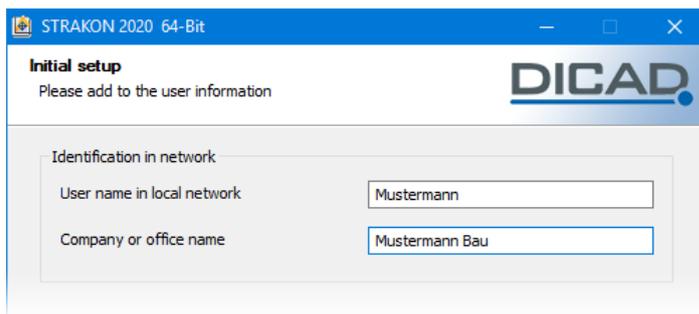
### Initial Installation



#### Install STRAKON for all users

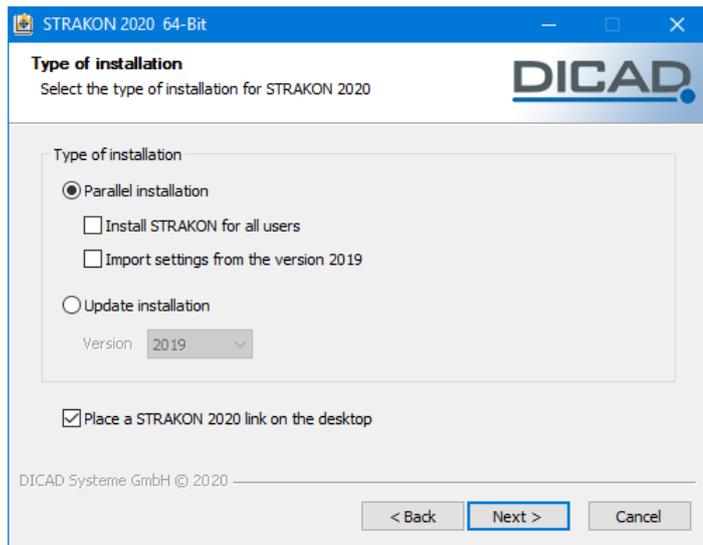
Please choose whether the user data should be installed separately for every user (folder **AppData\Roaming\DICAD**) or once for all users (folder **C:\ProgramData\DICAD**).

In the case of an installation of separate user data the user information is requested when STRAKON is started for the first time by the user. Every user should define a clear user name for themselves. In the case of an installation of user data for all users the request is made once during the initial start of STRAKON by the first user, i.e. all further users have the same user names in STRAKON.



This user name is used at times for various blockages in STRAKON, for example for a drawing which is being edited etc.

## Update/Parallel Installation



### Parallel installation

Please choose whether the user data should be installed separately for every user or for all users. As an option, settings may be transferred from an installed STRAKON Version 2019.

The following are transferred:

Plotter/printer drivers (only \*.use except for **standard\*.use**, **plotter.ger** and **sysfplot.ini**) and diversion files, tablet configuration, screen settings, layer sets, colors, editor settings, Excel template files, images from the template directory, input dimensions, text modules, title block data, back-up file (**secur.sic**), settings for data export (PPC, BVBS, etc.), default sets (except for **standard.set**), assignment files for the DWG/DXF import/export, dialog settings for back-ups, unitization (all SYS files), settings for automatic snapping to points, **einbau-s.dat** for PPC export, definition files for design meshes and settings from the menu **Settings > General settings**.

All files are copied locally into the standard directories of the 2020 version.

### Update installation

Choose the version onto which STRAKON 2020 should be installed. All files are copied into the standard directories, e.g. embedded parts to ...**lebt**.

### Placing a STRAKON 2020 link on the desktop

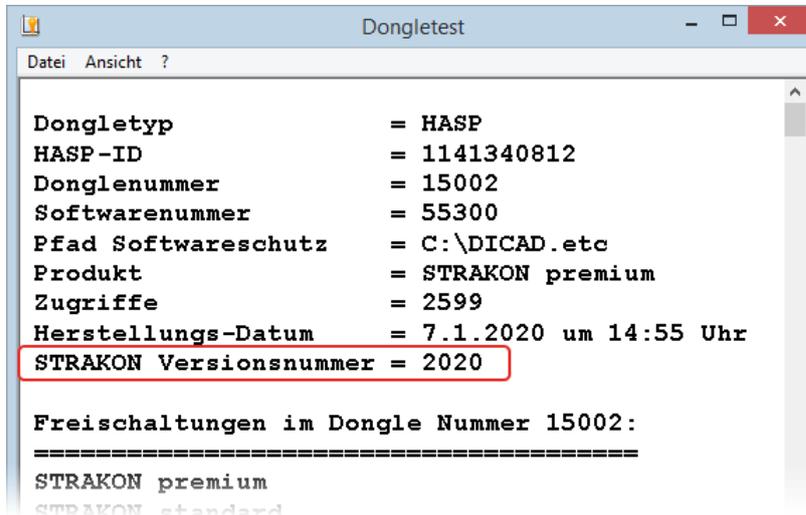
Activate the option if the program link to STRAKON 2020 for all users is intended to be placed on the desktop.

## License

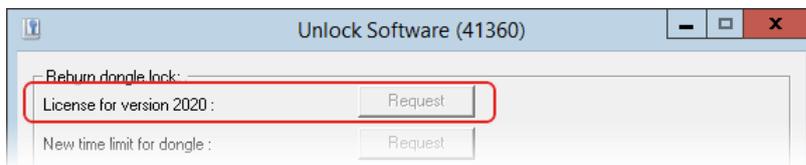
### Version License for the Dongle

A version license is not usually necessary for the dongle used in the context of the service agreement!

Check the version number in the dongle via **Start > Programs > DICAD 2020 > Dongle Test**:



Should a pre-2020 version number be displayed in the marked line, please request a version release for the dongle. Open the license via **Start > Programs > DICAD 2020 > Unlock Modules**:

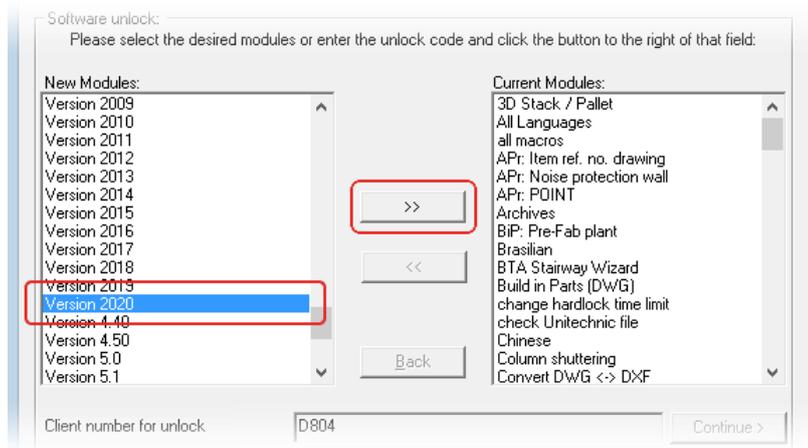


Click on the **Request** button, complete the fields and send the request to the responsible customer services department.

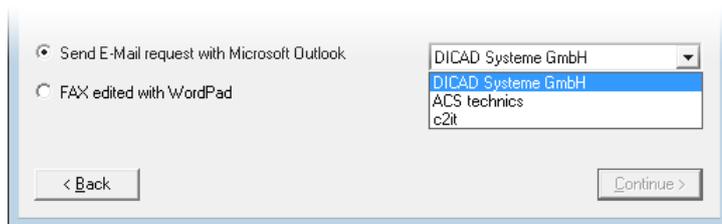
## Licensing the Modules for the Computer

It is only possible to unlock modules (e.g. Steel Construction Variants etc.) using an unlock code for the computer in question.

Open the license via **Start > Programs > DICAD 2020 > Unlock Modules**:



Mark the modules, click on >> and **Continue**, complete the fields and send the request to the responsible customer services department.



## Registering the Unlock Code

After receiving the unlock code, open the license via **Start > Programs > DICAD 2020 > Unlock Modules**, enter the unlock code in capital letters and click on **Register**.

We wish you every success in all your work with the 2020 version.

Should you have any further questions, please do not hesitate to contact us.

Your DICAD Support Team

# Important Information for the 2020 Version

Please read this information before you update to STRAKON 2020 or if you wish to further edit existing drawings/projects from STRAKON versions lower than 2020 with this version.

The following files will be restored when accessed from STRAKON 2020 and are **not** compatible with STRAKON versions lower than 2020:

## 1. Drawing administration (strako.db)

The drawing administration is restored by an extension of the optionally displayed columns. The previous drawing administration is saved in the sub-directory **strako.v20** in the active working directory as **strako.db.v20**.

## 2. Material, surface administration

These items are restored on initial access by extensions in this administration. If these administrations are still required for STRAKON versions lower than 2020, you should save them beforehand and choose them using a separate master data path in the older STRAKON versions.

## 3. World coordinates

As a result of the new features in the area of world coordinates (see description of new features) we recommend completing drawings with world coordinates from STRAKON versions lower than 2020 in the older STRAKON version.

## 4. Model references

When saving a drawing, the model reference is saved in the new format **\*.smrc**.

For projects with existing model reference from STRAKON versions lower than 2020, create the model reference in the old format (**\*.smr**) in Cube using **Save as**.

An insertion of model references with a link is no longer possible from STRAKON 2020 onwards.

## 5. Upper and lower case lettering of drawing names

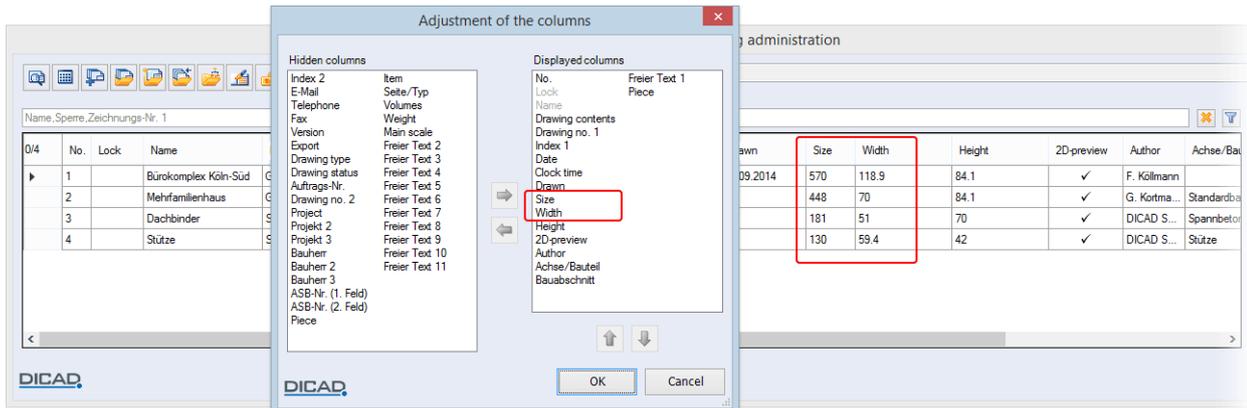
The file name in the operating system matches the upper and lower case lettering of the drawing name in STRAKON.

# General

## Drawing

### Expanding of Number of Columns in the Drawing Administration

You can now choose additional columns in the drawing administration for an individual adjustment of the schedule. The available columns have been extended in the dialog **Adjustment of the columns**, for example, the **size** and **width** of a drawing can now be displayed:



For drawings from STRAKON versions lower than 2020 these additional columns are filled with content after initial saving of the drawings in STRAKON 2020.

By selecting additional columns in this dialog, the STRAKON database (**strako.db**) is restored within the program. As a result, the previous database is backed up in the directory **strako.v20** under the file name of **strako.db.v20**.

This back-up process is also applied as soon as you open a working directory in the drawing administration in versions lower than 2020.

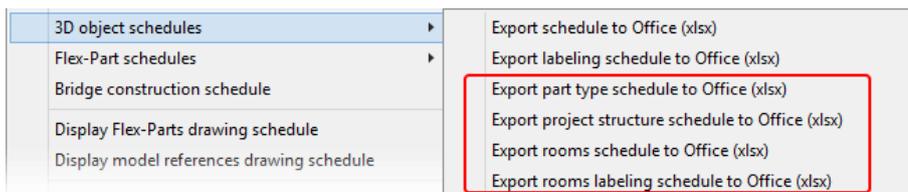
### STRAKON Working Directory: New Standard Folder

The folder **external-properties** will now automatically be created in each STRAKON working directory for the data exchange between an ERP system and STRAKON (see the online helps, chapter Datenaustausch zwischen CAD und ERP (Betsy, ...)).

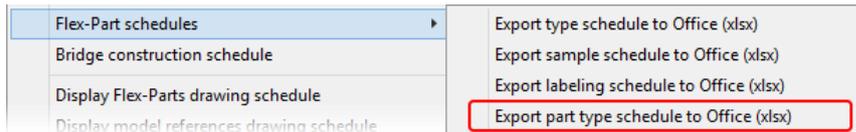
## User Interface

### Menu "3D design" Expanded

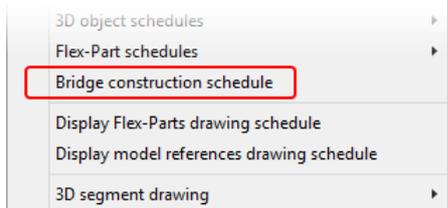
In the menu **3D design** the functions **3D object schedules** and **Flex-Part schedules** have been expanded. An addition is the function **Bridge construction schedule**.



See also 3D Objects, Export Additional Schedules, page 52



See also Flex-Parts/Objects, Export an Additional Schedule, page 53



You can export a schedule of all labeled height points of a bridge cross-section into an XLSX file.

## Icon Bar: Traffic Light for 3D Views

The traffic light gives a colored indication of the update situation of the 3D views and the option of directly updating all affected views which still need to be updated by clicking on the icon.



All 3D views are up-to-date



Currently editing has taken place in **Cube**.



Currently editing has taken place in **Cube** and the drawing has been saved or changed using the menu **Window** without updating the views.

## Input Helps

### Entering Other Variables into the Drawing Data

For the takeover of text into a drawing, in addition to the internal key numbers such as !1 for the drawing name, you can now also enter into the drawing data the variables !Seg;xxx; and !Date;xxx; in the drawing data entry fields (see the online helps, chapter "General", Input helps, Take over drawing texts, Other variables), e.g.

#### Text entry using variables



#### Display in the drawing

Preliminary draft 2019-09-22

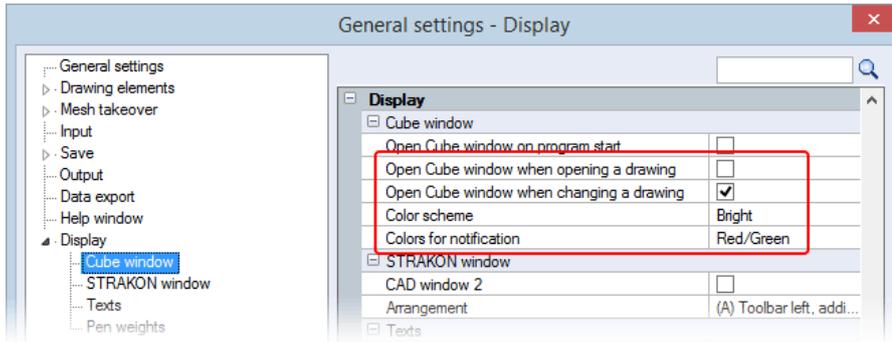
# Configurations

## Settings

### General Settings

#### Automatically open Cube window / Color display

The **display** has been expanded to include the option **Cube window**:

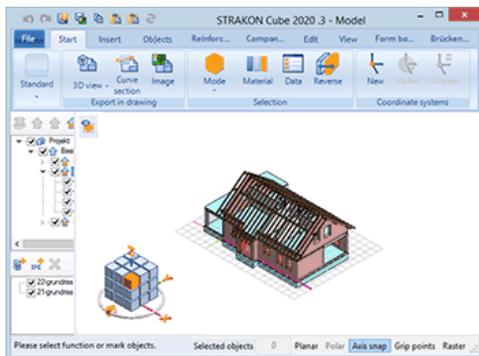


You can now determine that the Cube window automatically opens when opening a drawing.

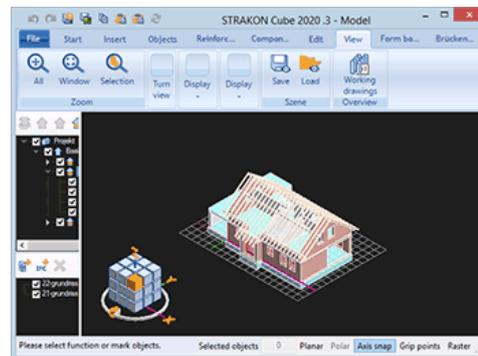
You can also control the automatic opening when changing a drawing by using the window schedule. If the Cube window for a drawing has already been opened, the program notes this setting and opens the **Cube** when recalling the drawing. The Cube window opens as a result with a display of the complete model.

You can now choose between the color scheme **Bright** and **Dark** for the background of the Cube window.

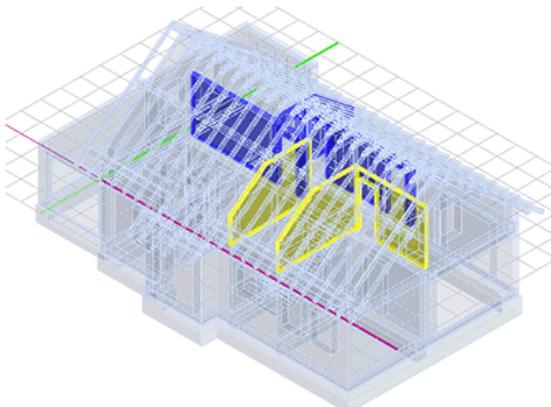
#### Color scheme **Bright**



#### Color scheme **Dark**



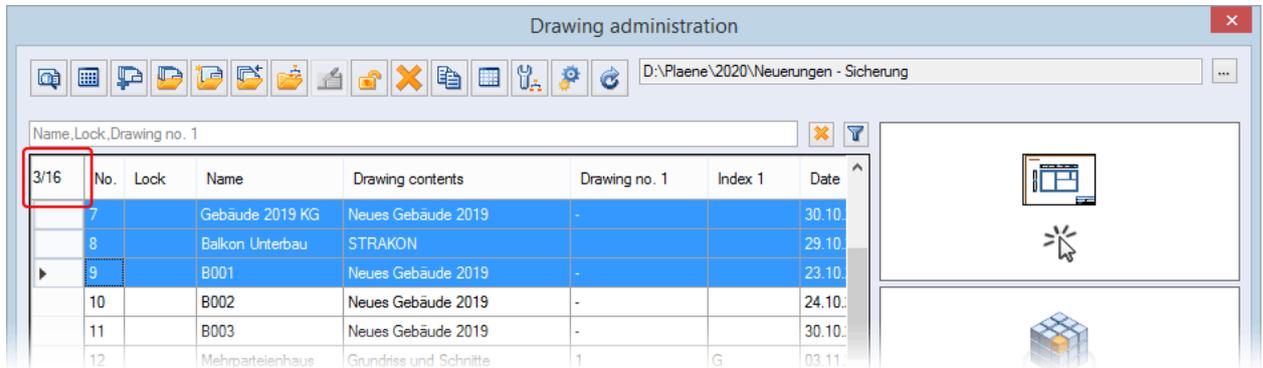
For the display of negative objects, conflict control, model comparison and in the functions **Slope areas** and **Extrude areas**, in addition to the existing color combination of **Red/Green** you can also choose **Blue/Yellow**:



## Administration

### Schedules in dialogs expanded

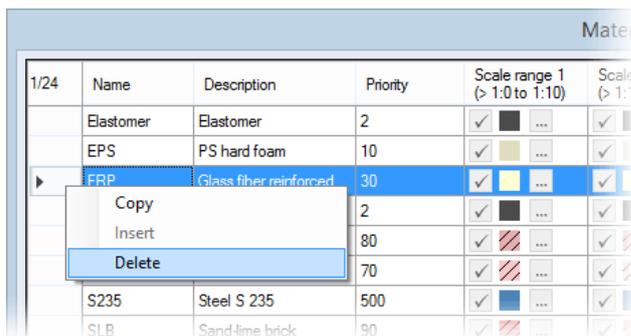
The first column title gives the information of the marked and existing rows of this schedule.



## Material

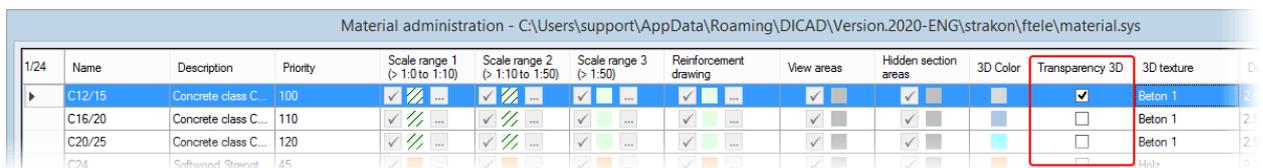
### Delete materials in the administration

You can delete one or several materials using the context menu in the material administration.



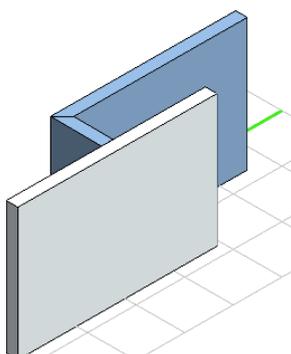
### Display material as transparent

The dialog box has been expanded to include the column **Transparency 3D**:

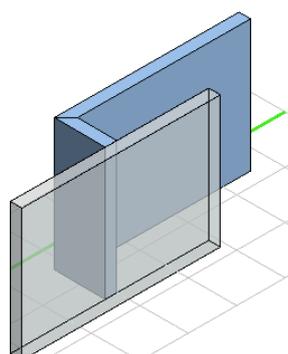


You can display the material of a component as transparent by activating the option.

Option deactivated



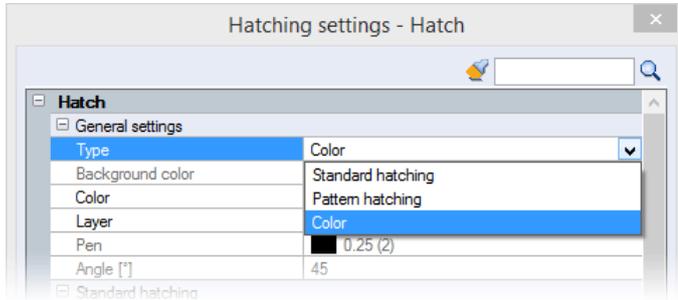
Option activated



**Material/surfaces**

**Display view areas/surfaces with a standard and pattern hatching**

In addition to the **color** you can now also choose **Standard** and **Pattern hatching** for the display of both the view areas/surfaces and the hidden section areas in 3D views.



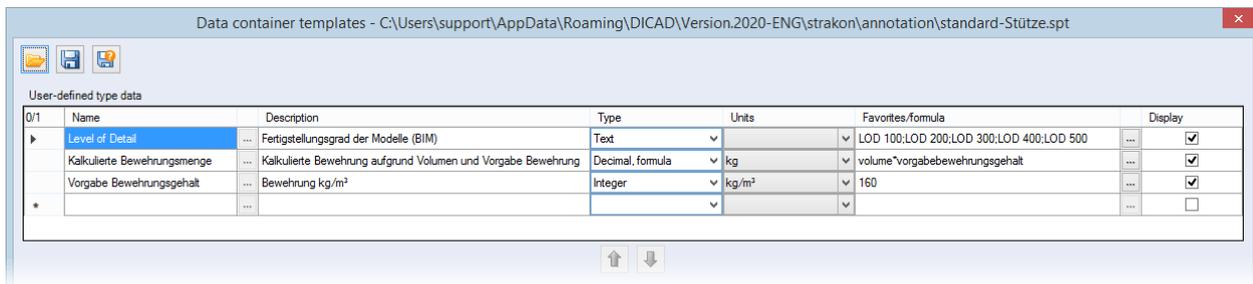
**Note:**

The use of colored and hatched view areas/surfaces changes the files **material.sys** and **surface.sys**. i.e. You can no longer access these files using a STRAKON version lower than 2020.

**Part styles**

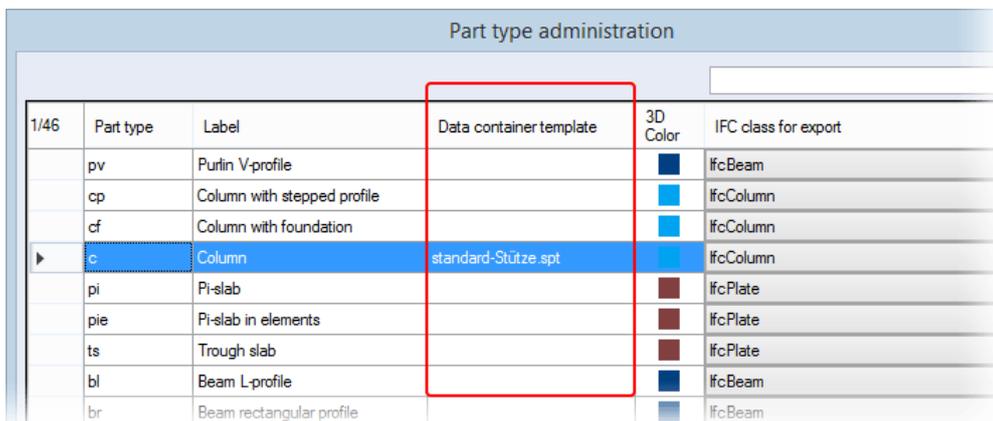
**Part style related data container templates**

You can now allocate more user-defined data to a 3D object using the part style related data container templates.



Four data container templates (**standard-Balken**, **standard-Decke**, **standard-Stütze**, **standard-Wand**) are supplied with the 2020 version. For the templates **standard-Balken** and **standard-Wand**, the calculated quantity of reinforcement is determined using the area (m<sup>2</sup>). Otherwise, the calculation takes place using the volume (m<sup>3</sup>).

In the part type administration, you can now assign these and additional user-defined templates using the new column **Data container template**:



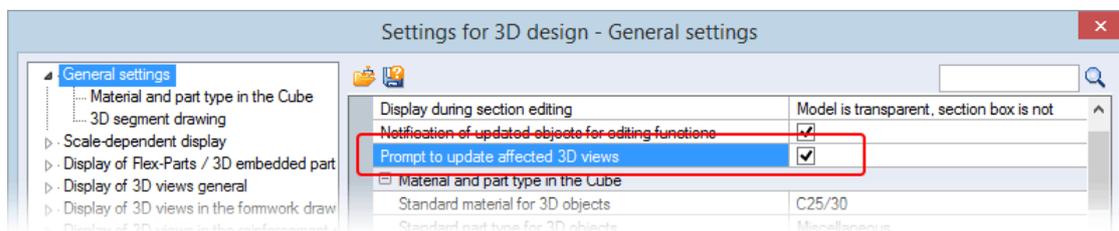
If you then create a 3D object with the part type, for example, **Column**, this 3D object will contain more information than those without a stored data container template.

Name: Column (1)
Description:
Type: 3D object\Sweep
Volumes: 0.172 m <sup>3</sup>
Weight: 0.43 t
Surface: 2.875 m <sup>2</sup>
Materials: C25/30
Part type: Column
IFC class (for export): IfcColumn
Kalkulierte Bewehrungsmenge: 27.5 kg
Level of Detail: LOD 100
Vorgabe Bewehrungsgehalt: 160 kg/m <sup>3</sup>
Length: 275 cm
Relevant for length: Yes
Negative object: No

## 3D design

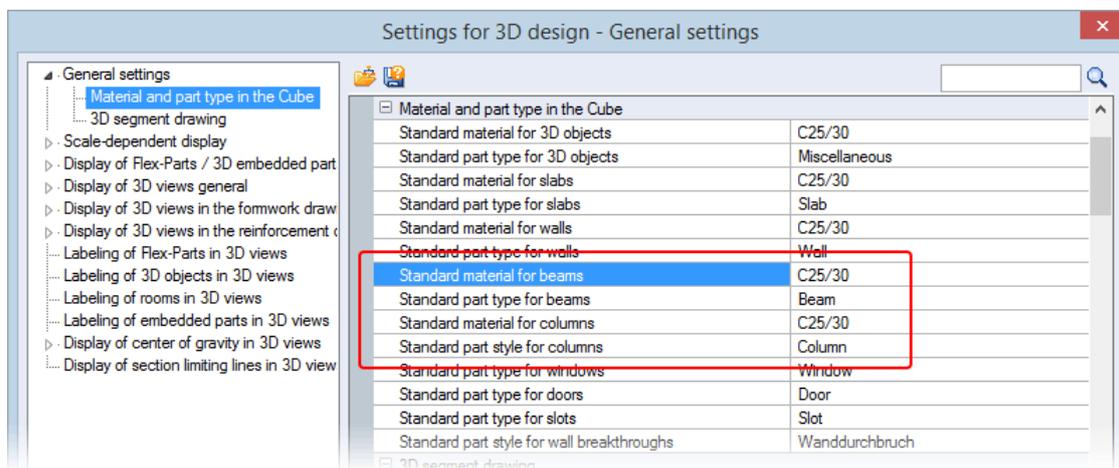
### Prompt to update affected 3D views

If the option is activated, the prompt to update affected 3D views is displayed during loading or changing of a drawing.



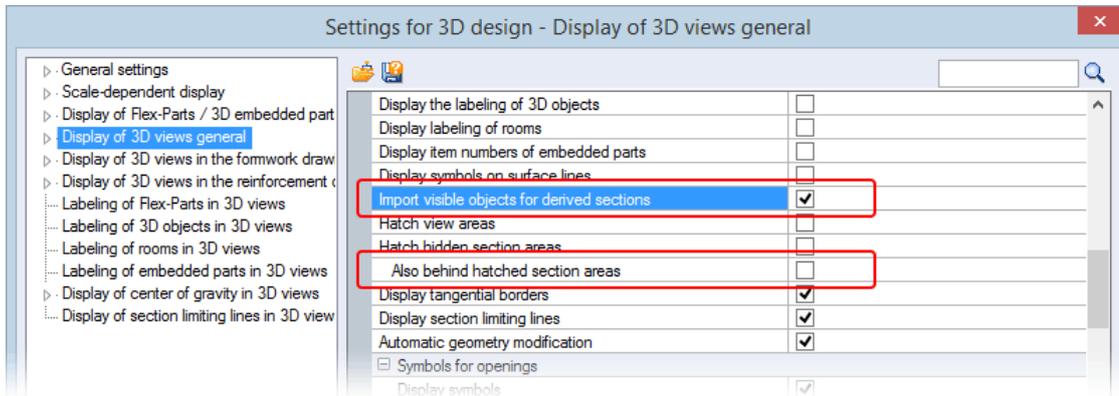
### Standard material/part style for beams and columns

For the modelling of 3D objects, you can also determine both the standard material and a standard part style for **beams** and **columns**.



### Import visible objects for derived sections

Activate the option if it is only intended to display the visible objects of the original view in a derived view (function **New section**).

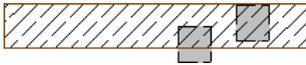


### Hatch also behind hidden section areas

Activate the option **Also behind hatched section areas** if it is intended to hatch hidden section areas, for example, rising walls, using a color, behind existing section areas.

We recommend choosing a standard type of hatching without any background color for the hatching.

Option activated



Option deactivated



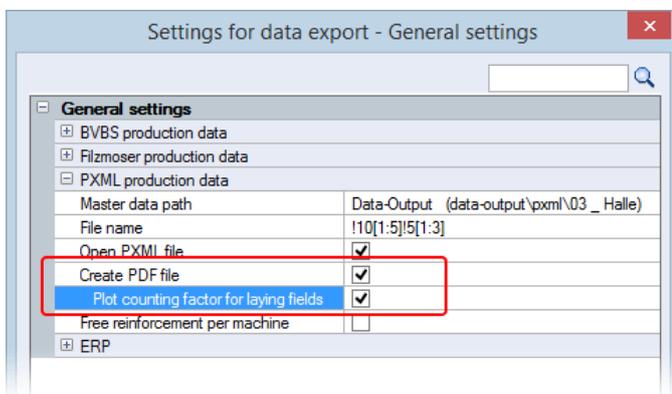
#### Note:

A change in this setting has an effect on all existing 3D views when updating.

## Data Export

### PDF file of PXML production data

In the PXML export you can now create a PDF file of a drawing as an option which is exported in a similar way to the PXML file into the target path. Additionally, you can activate the export of the counting factors using the option **Plot counting factor for laying fields**.



## Schedules

### New Schedule Templates for 3D Objects

You can select schedule templates for 3D objects for the subject areas of “3D objects part style” and “3D object project structure”.

The following templates are available for use:

#### Drawing

DICAD\_3D-Object-PartType.xml  
 DICAD\_3D-Object-Project-Structure.xml

#### Office

DICAD\_3D-Object-PartType.xlsx  
 DICAD\_3D-Object-Project-Structure.xlsx

### Define Decimal Places in Schedules as Desired

You can now determine the number of decimal places for values shown as a decimal in the XML-format schedule. For this, determine the entry, for example, **format=".3"** in the XML file after the variables for the display of 3 decimal places.

```
<Cell text="$totalvolume"/>
```

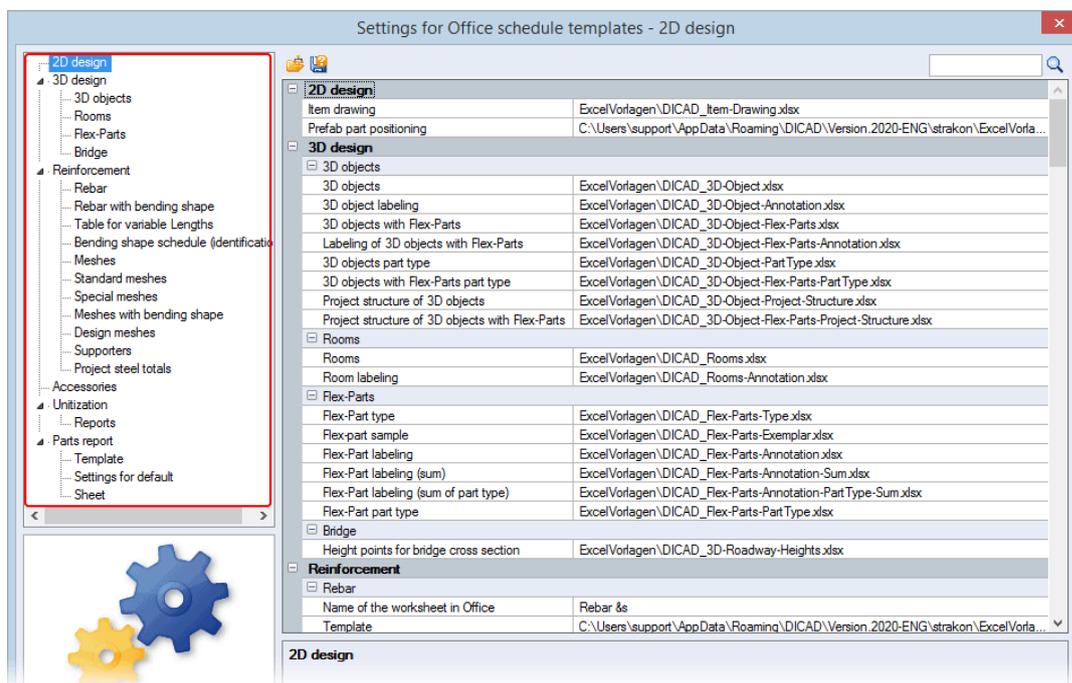
Stück	Teileart	Gesamtvolumen [m³]	Gesamtgewicht [t]	Gesamtb...
6	Dachbinder I-Querschnitt	1.26	3.18	
1	Fundament	1.08	2.7	
2	Stütze	0.08	0.02	

```
<Cell text="$totalvolume" format=".3"/>
```

Stück	Teileart	Gesamtvolumen [m³]	Gesamtgewicht [t]	Gesamtb...
6	Dachbinder I-Querschnitt	1.264	3.18	
1	Fundament	1.083	2.7	
2	Stütze	0.082	0.02	

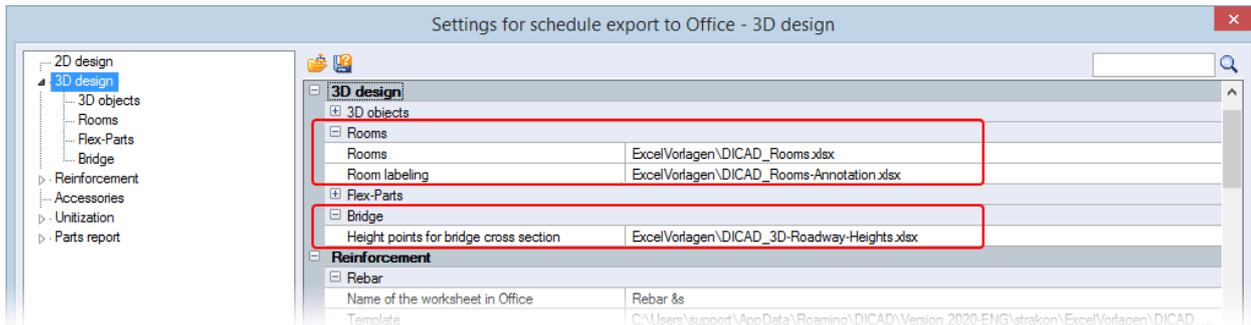
### Dialog “Schedule Export to Office (xlsx)” Revised/Expanded

The dialog **Settings for Office schedule templates** has been given a new structure. The categories **2D design**, **3D design** and **Reinforcement** have been created under which the appropriate templates can now be found:

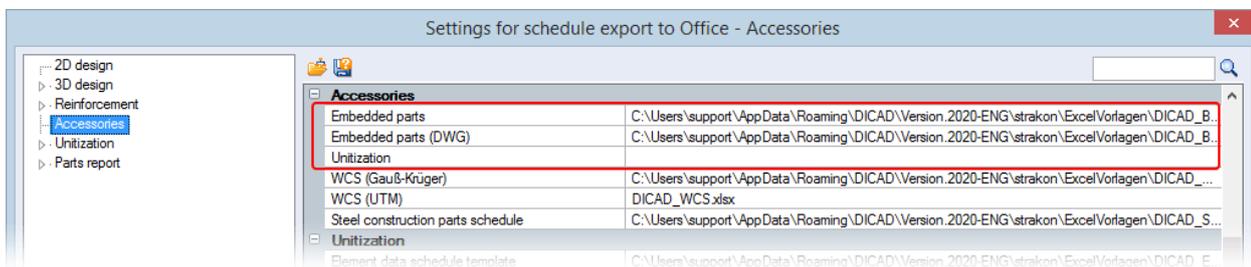


## Configurations

An addition are templates for the export of schedules of the rooms / labeled rooms and the height points of a bridge section.



You can now also select appropriate templates in this dialog for the export of schedules of embedded parts (2D/3D), embedded parts (DWG) and macro unitizations:



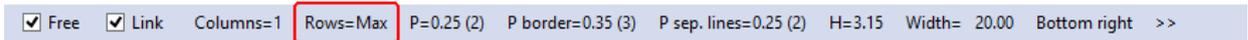
# Basics

## Drawing

### Index Schedule/Administration

#### *Schedule on a drawing*

You can minimize the number of indices to be displayed for export on a drawing.



Here, the most recently input index entries are displayed using the row count. Enter “0” to display all rows. This is marked in the additional function toolbar as **Rows=Max**.

#### *Index administration*

It is no longer absolutely necessary to mark an index as “Current” in the management. The index schedule can thus be positioned as a filler on a drawing (see Create Symbols With Schedules, page 20).

# 2D Drawing

## Edit Elements

### Input Helps

#### Key assignments expanded

You can now use the new key assignment **Z** for determining the slope angle (**A=...**) during the editing (copying, moving, ...) of elements. In this, an element is turned in 90° steps around the reference point.

### Correct Multiple Arc/Curve Dimension

The position of the dimension of a multiple arc and curve can now also be corrected.

## Accessories

### Create Symbols with Schedules

You can save schedules which are positioned on a drawing directly to a symbol. In this, the current schedule settings are extracted from the appropriate function.

**Example:** Combine a title block with an index schedule

d	Änderungen der arch. Prüfung übernommen	DICAD	29.08.2019
c	Bodenplatte mit Einlaß	DICAD	13.08.2019
b	Küchenfenster um 15cm verschoben	DICAD	02.11.2019
a	BRHKüchenfenster	DICAD	09.09.2019
Index	Beschreibung	Bearbeiter	Datum

Planindexseite	
<b>Projekt:</b> Neubau eines Zweifamilienhauses	<b>Gezeichnet:</b> M. K. S. M. A. U.
<b>Planziel:</b> Ansichten und Schnitt Musterstr. 4711, 51149 Köln	<b>Datum:</b> 26.08.2019
<b>Projektnummer:</b> 2020	<b>Freigegeben:</b> JA <input type="checkbox"/> NEIN <input type="checkbox"/>
 DICAD Systeme GmbH Claudiastr. 2 b 51149 Köln	

#### Note:

- Schedules which already exist in a drawing are not re-positioned during the installation of the symbol.
- Where a symbol is installed several times, only the first installed symbol is given the schedules.

## Embedded Parts

### Schedule description expanded

The text for describing an embedded part in a schedule (description) has been increased to a maximum of 256 characters.

## World Coordinates

In the program you can now work as an option with either the Gauß-Krüger coordinate system or UTM. An automatic transformation from UTM to Gauß-Krüger is no longer necessary.

The coordinate system is now specified, i.e. you can only work with one type (UTM or Gauß-Krüger) of coordinate system on a drawing. The determination of the coordinate system takes place manually within the function **Segments** or through an import, for example, of a DWG file. This applies to all segments.

When using world coordinates (UTM and Gauß-Krüger), a scale factor of **1** is always used by STRAKON (the surveyor's data must take this into consideration).

Please note that a world coordinate system that is selected in 2D automatically applies for 3D, that is to say Cube. However, if a world coordinate system has been previously defined in Cube, this automatically applies for 2D in all segments (see also 3D Modeling, Bridge Construction Tab, page 47).

### Note:

- *You can no longer change a coordinate system type which has been defined for a drawing, i.e. the import of data from another type is then no longer possible.*
- *The type is automatically set to Gauß-Krüger during loading into STRAKON 2020 for drawings from STRAKON versions lower than 2020. We therefore recommend completing the drawing in the previous version.*

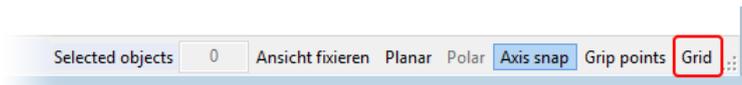
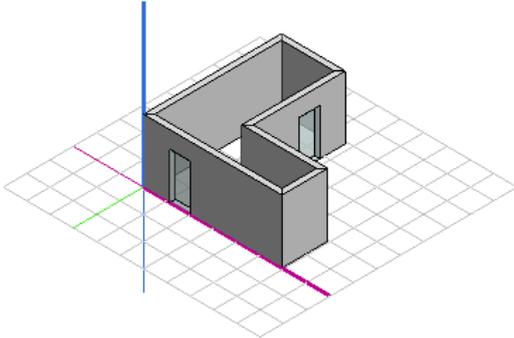
# 3D Modeling

## Cube

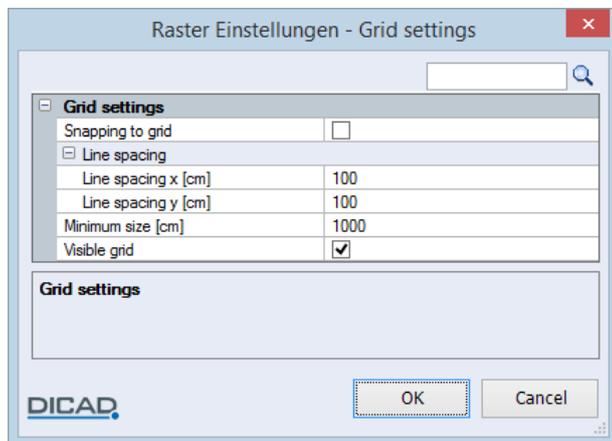
### User Interface

#### New grid in Cube

A grid is now displayed as an option to support entries in **Cube**. The grid automatically adjusts to the size of the project during entry.



Open the setting dialog in the status bar using the new option **Grid**. You can activate and deactivate the visibility of the grid and automatic snapping of the grid points using the options. You can determine the minimum size of the grid during editing in **Cube** and the distances between the grid lines in x- and y-direction.



#### Design “planar”

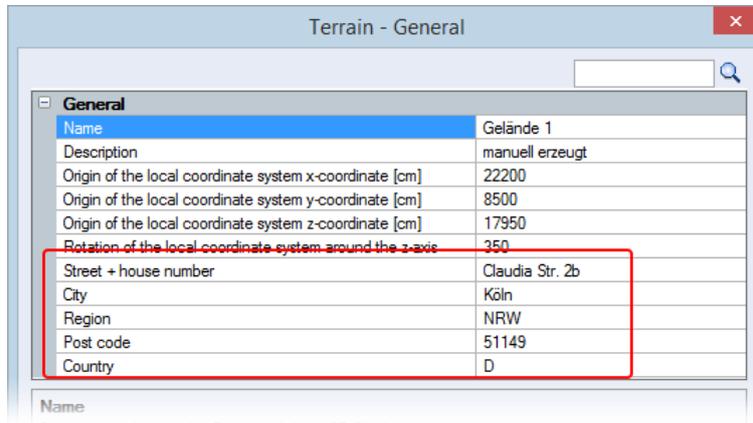
After the calling up of some functions, the entry type **Planar** is now automatically activated, i.e. the entry takes place in the x-/y-layer of the active coordinate system and not in the perspective. This concept is used for instance for the design of walls and columns in order to enable rapid work in a plan view (see also Edit Tab, Modeling group: Extrude areas, page 42).

The view of the model can be changed at any time using the Cube operating element.

## Project structure

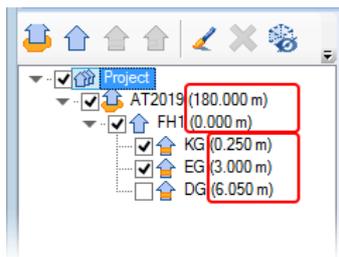
### Terrain and building with address information

The properties of a terrain and building have been expanded to include the address data. STRAKON complies with a further export criterion for IFC 4.0 certification with this information.



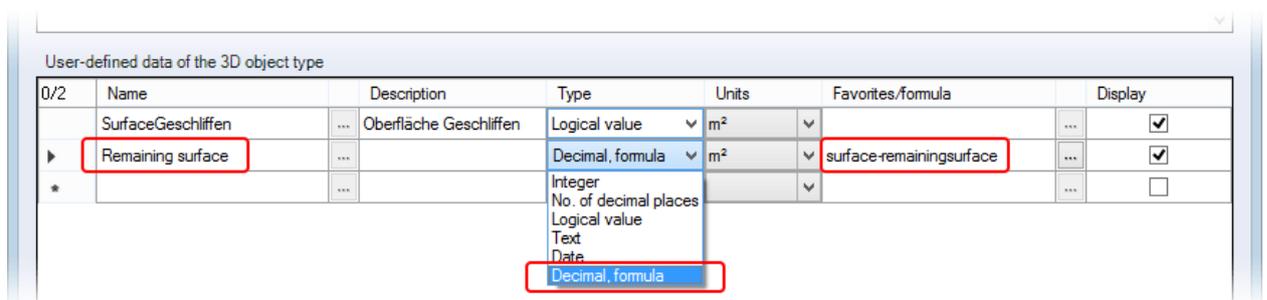
### Layer with datum level value

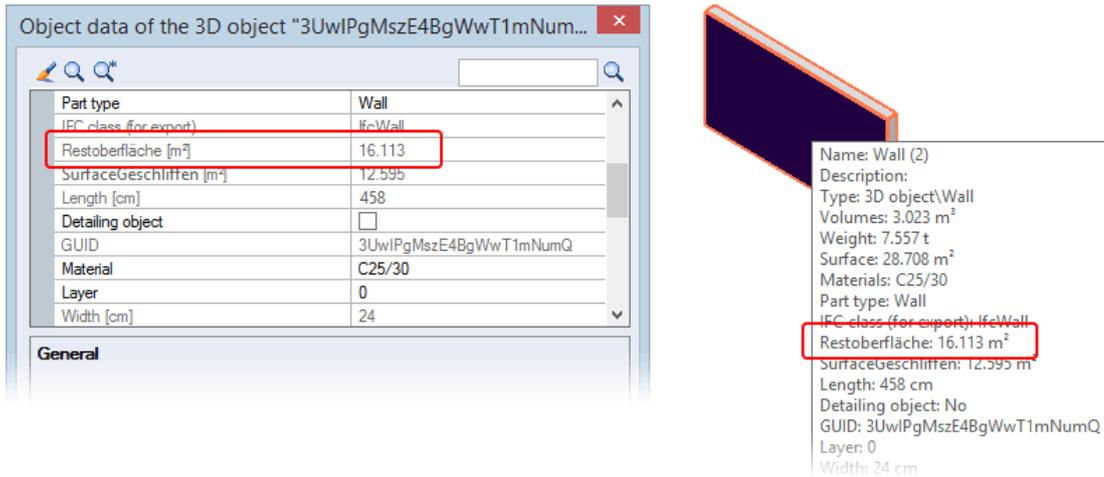
The datum level value (position of a layer in the z-coordinate) is now displayed in the project structure for every structure layer:



## Calculate in a Data Container

You can now define formulae in a data container in order to calculate e.g. the untreated surface of an object from the complete surface (e.g. remaining surface). To do this, you choose the new type **Decimal; formula**. You define the formula with the aid of variables and arithmetic operators (+, - and \*).



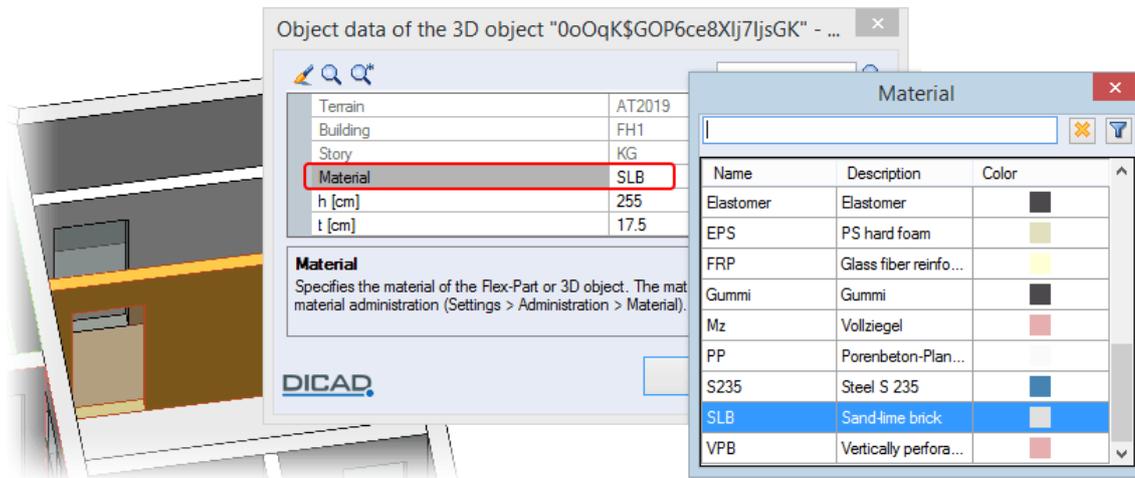


## Object Data via a Double-click

By double-clicking on a selected object, you now quickly open the data container of a 3D object.

## Change Material via Object Data

You can now change the **material** for 3D objects in the object data.



## Start Tab

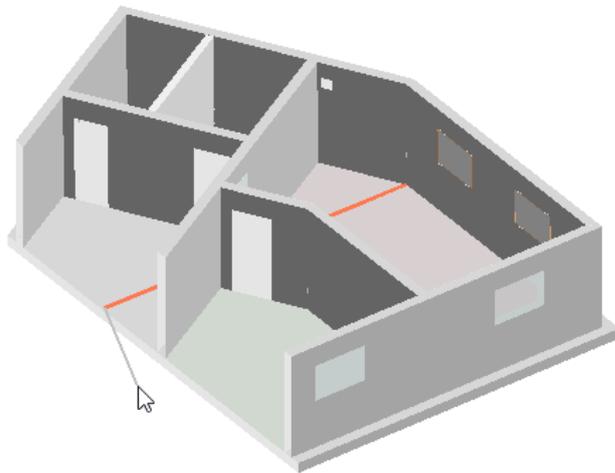
### Standard group: Dynamic section



### Additional icon toolbar

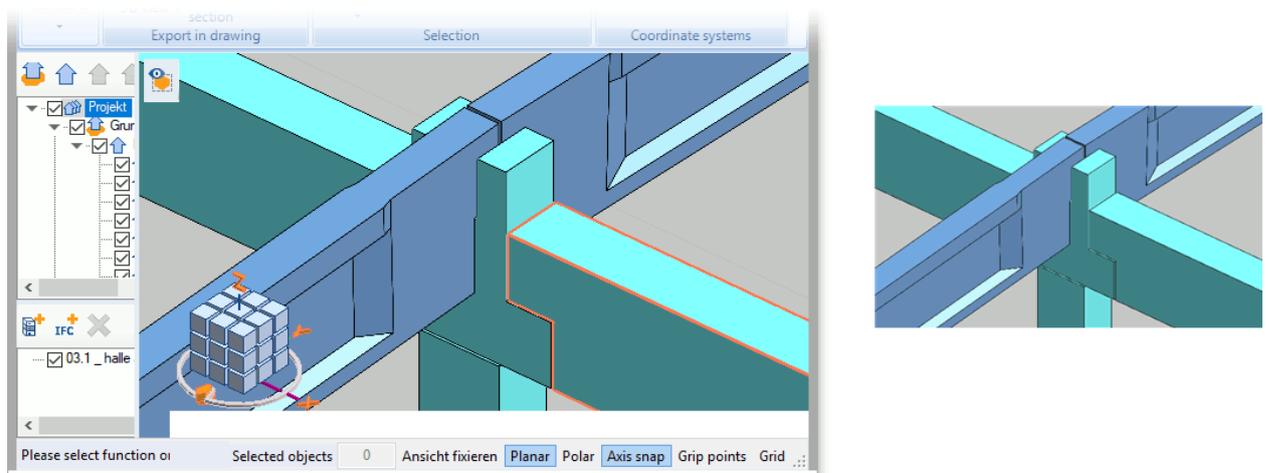


The dynamic section now enables quick creation of section views in a model. You drag a section layer through a model which begins from the zero point of the active coordinate system of a layer. Using the additional icon toolbar, you can determine from what direction the section should be carried out. The section can run both in a negative and in a positive direction from the zero point of the coordinate system. You can activate/deactivate the snapping to points for the grid as an option.



### Export in drawing group: Image

To display the whole of a window as an image, confirm the export simply by right-clicking.

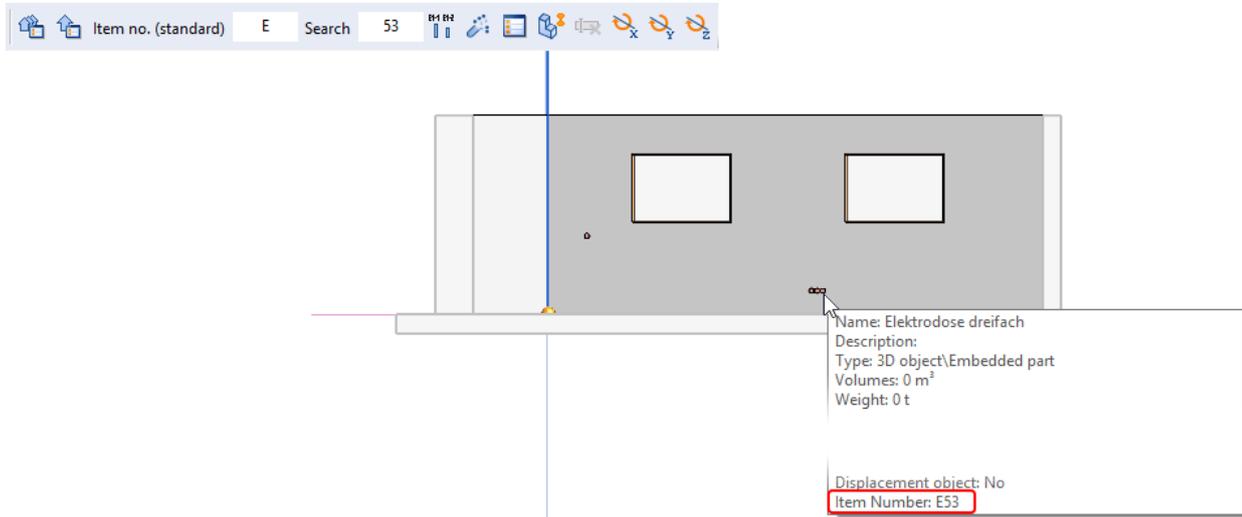


## Insert Tab

### 3D group: Parameterized embedded parts

For parameterized embedded parts, the item number of the embedded part is now transferred when inserting the embedded part.

#### Additional icon toolbar

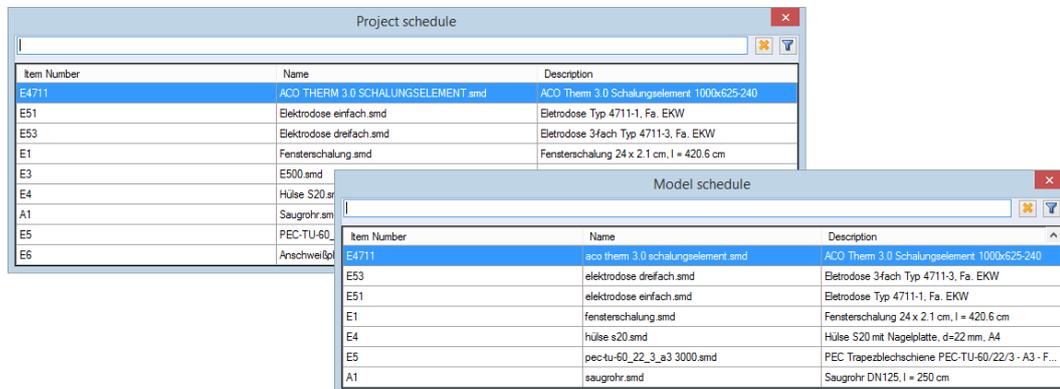


The following options are available for determining an item number:



#### Project schedule (F1), model schedule (F2)

Choose an embedded part using the project or model schedule



The item number is transferred (without incrementing) from the previously inserted embedded part.

#### Item no. (standard)

#### Item no. standard (F3)

Transfer item number in accordance with the saved specification in the embedded part

Select an embedded part from the administration.



The item number is transferred in accordance with the specification that is saved in the type data of the embedded part, i.e. if the item number in the type data is **E0**, an item comparison is started on insertion, the prefix transferred and the number **E1** issued. If the item number is already present in the project (e.g. **E1** to **E5**), the next highest number **E6** is issued.

**B0**

### B0 (F4)

Item comparison or search for free item number

The last item number is used as a default, e.g.

1. Last entry: **55**  
 Default: **0**
2. Last entry: **B100**  
 Default: **B0**

After clicking on the function, choose the embedded part from the administration.



Name: Anschweißplatte
IFC class (for export): IfcBuildingElementProxy
Item text: %POS%
Item number (standard): <b>B0</b>
Negative object: No
Displacement object: No
Item Number: <b>B3</b>

The default item number that is saved in the type data of the embedded part is ignored. An item comparison then takes place. If the item number is already present in the project with another embedded part or other type data, the next free number is issued, e.g. **B3**.

**F100**

### Item number (F6)

Enter item number

Enter a number into the entry box, e.g. **F100**, and confirm with Enter. Select the embedded part from the administration.

The default item number that is saved in the type data of the embedded part is ignored. The item number after insertion is **F100**. If the embedded part is already present in the project with the same type data, the item number from the project is automatically used, e.g. **B3**.

If you confirm the last entered item number in the entry box after insertion, you can both insert the same embedded part into a Flex-Part and insert it once again.

Before positioning an embedded part, you can decompose the object structure using the function **Decompose object immediately on insertion (F8)**, **insert the embedded part into a Flex-Part** and rotate it around any axis.

**B1 B2**

### With sub-item (F7)

A further innovation is that an embedded part can have differing lengths. For this, you can enter the embedded part with a sub-item number (e.g. **E1-1**, **E1-2**, **E1-3**). Click on the icon **With sub-item** if the item number should be automatically supplemented using a sub-item search **-0**.

Select an embedded part profile from the administration for this type of item numbering.

You create embedded part profiles (\*.psmd) in the **Objects** tab > **Profiles** group > **Create in the editor** function. You can give the lines of the profile dimensions including variable names for a major parameterization.

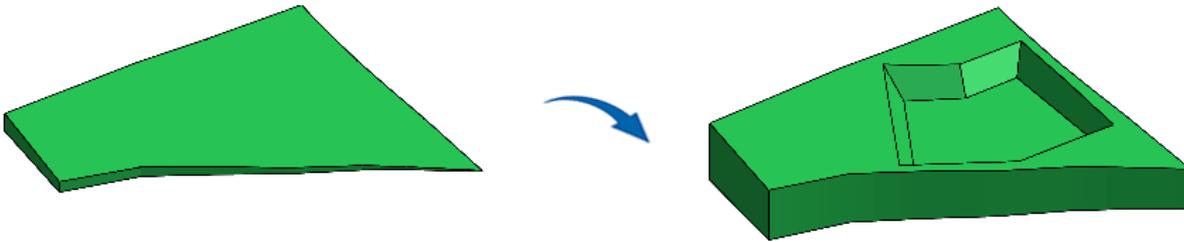
If you select an embedded part profile when inserting from the administration, the additional icon toolbar is expanded to include the entry boxes for **Length** and user-defined dimension parameters.



In addition to the entry of a fixed length, you can determine the length using the function **Profile along the entry** (sweeping).

### 3D group: Edit inserted terrain section model/file

After the insertion of a terrain section model (with the information on the original coordinate system) you can now also edit it, i.e. extrude areas, recess using negative objects, etc.



## Objects Tab

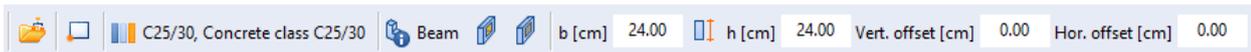
### 3D objects group: New functions “Beam”, “Column” and “Room”

The 3D objects group has been expanded to include the “sweep” objects **Beam** and **Column**.



Beam

#### Additional icon toolbar



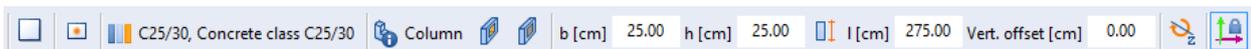
You create a beam in a similar way to a wall using an extruded profile. You can open a profile using the administration. You determine the insertion point, material and part style as well as the width and height of the beam in a similar way as for a **column**.



Column

After clicking on the function, the model is rotated automatically to the view from above.

#### Additional icon toolbar



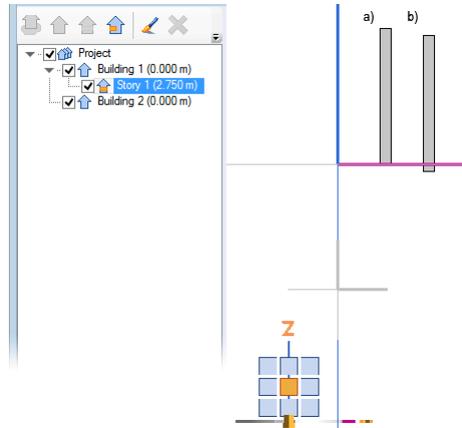
You can choose between a rectangular and a round column and determine the insertion point, material and part style. You determine columns using the input options **Width**, **Height** and **Length**. You determine round columns via the **Diameter**. The entry of a vertical offset is possible and you can rotate the position of the column in 90° steps around the z-axis.

There are three entry modes for determining the column length:



### Column length (F9)

Enter the length (**l [cm] (F10)**). You determine the vertical displacement in relation to the underside of the column using the vertical offset.



Layer: Story 1 (2.75 m)

a) Entry:  $l = 300$  cm  
Vertical offset = **0.00** cm  
Column length = 300 cm

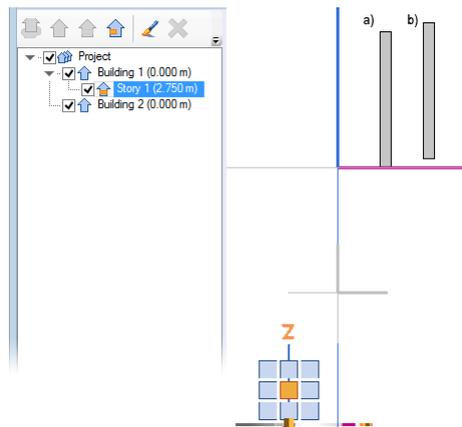
b) Entry:  $l = 300$  cm  
Vertical offset = **-15** cm  
Column length = 300 cm

If you choose one of the following entry modes, the entry type **Planar** is automatically activated.



### Datum levels based on story level (F9)

The length of the column is derived from the input of the underside/top side. The insertion of the column is based on the z-coordinate of the local (active) layer.



Layer: Story 1 (2.75 m)

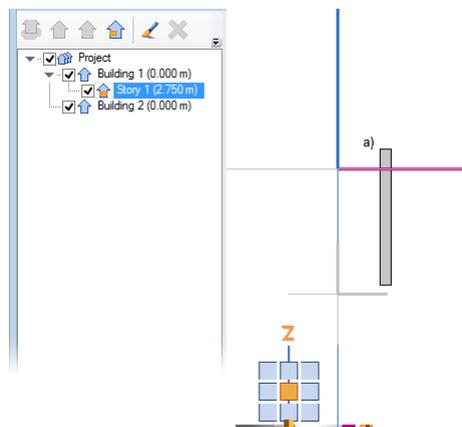
a) Entry: Underside = **0** / Top side = **300** cm  
Column length = 300 cm

b) Entry: Underside = **20** / Top side = **320** cm  
Column length = 300 cm



### Datum levels based on building layer (F9)

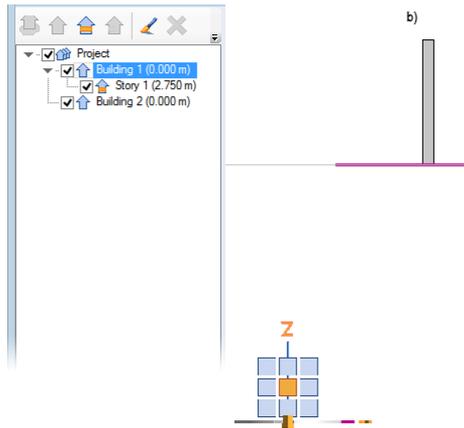
The length of the column is derived from the input of the underside/top side. The insertion of the column is based on the z-coordinate of the local (active) building layer and on the respective associated building layer in the case of an active sub-layer.



Active layer: Story 1 (2.75 m)

Building layer: Building 1 (0.00 m)

a) Entry: Underside = **20** / Top side = **320** cm  
Column length = 300 cm



Active layer: Building 1 (0.00 m)

b) Entry: Underside = 0 / Top side = 275 cm

Column length = 275 cm

#### Note:

You can determine both the standard material and a standard part style for **beams** and **columns** using the menu **Settings > 3D design**, see *Configurations, Standard material/part style for beams and columns*, page 15.

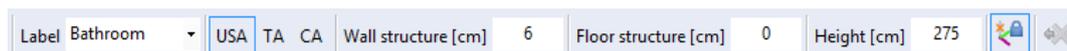
The **3D objects** group has been expanded to include the function **Room**.

With this function you can create rooms in your building project which you can later record in a room journal. You can determine detailed room information for individual rooms, such as the description, the intended use, the wall and floor construction and the room height. This provides additional construction-related information on the usage areas (net/gross) which is of interest to the architect and for the detailed design.



#### Create a room

#### Additional icon toolbar



#### Label

##### Label (F1)

Choose or enter a description of the room, e.g. hallway, bath, kitchen, for the labeling of the room in the 3D view using the selection schedule. This entry is retained until you exit STRAKON.

#### USA, TA, CA

##### Usage Area (F2), Technical Area (F3), Circulation Area (F4)

Intended usage of a room

The areas are displayed in differing transparent colors:

**USage Area** = red

**Technical Area** = green

**Circulation Area** = blue

#### Wall structure [cm], Wall structure (F5), Floor structure (F6), Height (F7)

**Floor structure [cm]** Thickness of the wall and floor structure and height of the room



### Activate/deactivate planar entry (F8)

Activate/deactivate entry only in the x-/y-layer of the active coordinate system

The program retains the selected setting even after exiting the function **Room**.

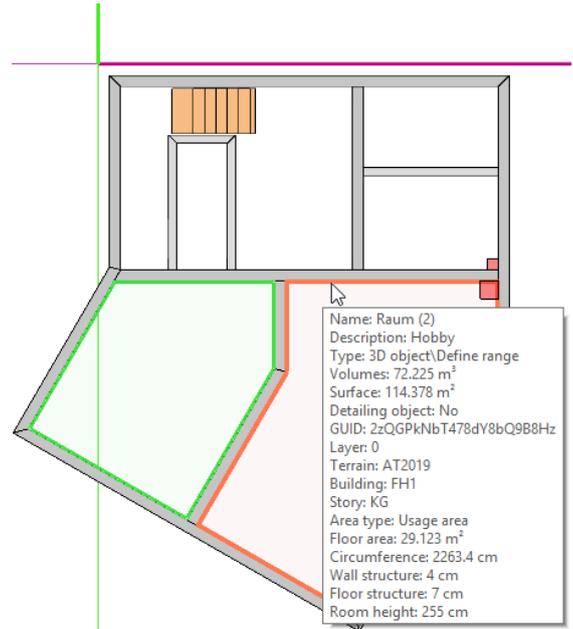
If this option is deactivated, "planar" entry nevertheless takes place if the option **Planar** is activated in the status bar.

You can now select polygon points for a room at any height on the z-axis which are automatically projected to the height of the active coordinate system. After you have defined the room properties, you determine in succession the room boundary points (curves are currently excluded). You can choose both object points and free points as points. The entry of the room only takes place in the x-/y-layer of the active coordinate system.

Once the entry is complete, the room boundary is displayed using lines and the floor area is given a color according to the chosen area type. The wall and floor structure is displayed using an additional line.

The labeling of rooms in a 3D view is possible. The labeling takes place using the data that exist for the room (see 3D Views, Label Rooms, page 55).

You can subsequently correct the area of a room using the grip points. Activate the option **Grip points** and select a room.



### Data container for mass and area calculation expanded

The data container has been expanded to include object data for the calculation of net/gross areas, weight and volume of walls. The net value is calculated from the gross value less the openings.

Gebäude	FH1
Stockwerk	KG
Material	C25/30
Höhe [cm]	255
Breite [cm]	24
Bruttofläche [m <sup>2</sup> ]	16.442
Bruttogrundfläche [m <sup>2</sup> ]	1.547
Bruttovolumen [m <sup>3</sup> ]	3.946
Gesamtoberfläche [m <sup>2</sup> ]	37.478
Bruttogewicht [t]	9.865
Nettogrundfläche [m <sup>2</sup> ]	1.547
Nettovolumen [m <sup>3</sup> ]	3.411
Nettoberfläche [m <sup>2</sup> ]	35.077
Nettogewicht [t]	8.527
h [cm]	255
t [cm]	24

**Allgemein**



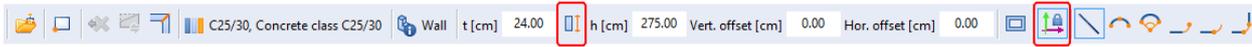
The wall axes taken into consideration for the calculation of wall connections with a miter:

### Direct change to the “Wall” function by “SmartClicking”

A direct change to the **Wall** function is possible by SmartClicking. Mark a wall by moving over it and pressing the **Shift** key. The mouse pointer changes its form from an arrow to an index finger. Keep the **Shift** key depressed and click on the **center** mouse key.

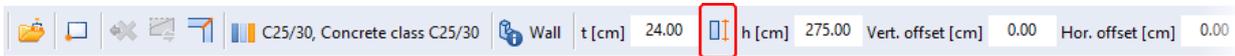
### 3D objects group: Wall

The **Wall** function has been expanded to include a choice of the entry mode and the option **Activate/deactivate planar top view**.



### Wall entry possible using three entry modes

After clicking on the function **Wall**, the model is rotated automatically to the view from above. You can now choose between three entry modes for the entry of a wall in a similar way as for a **column** (see function **Column**, page 28).



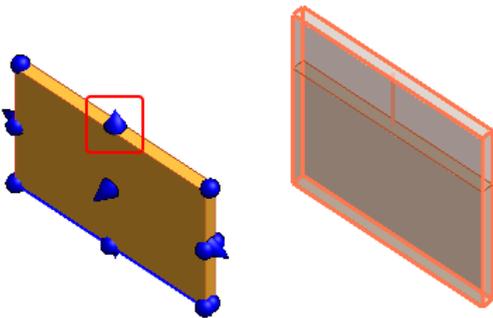
### Activate/deactivate planar top view

In the entry mode **Wall height**, the model is rotated to the view from above by activating the option **Activate/deactivate planar top view**, i.e. the entry takes place in the x-/y-layer of the active coordinate system and not in the perspective.

After a change from another function to the **Wall** function, it is always called up with the status (activated/deactivated) of the last selected setting.

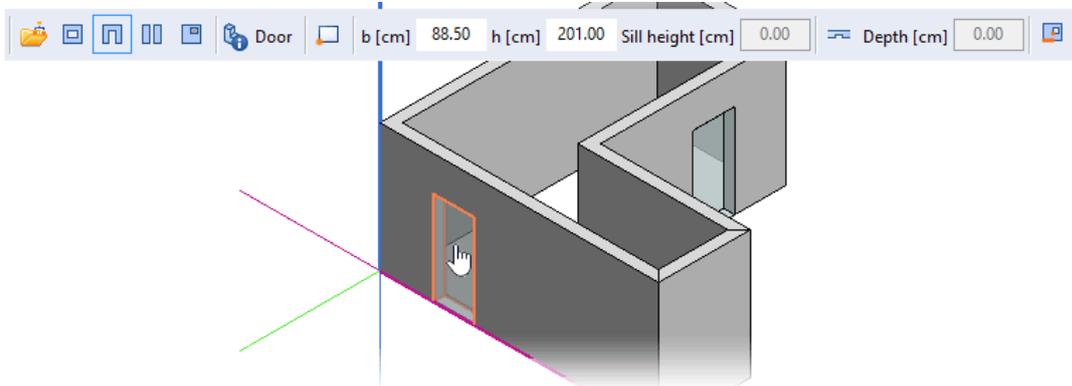
### New grip points for the editing of walls

Selected walls have been given additional grip points. A cone marks the center point of an area with which you can evenly increase/decrease the thickness, height and length of a wall.



### Direct parameter transfer of wall openings by “SmartClicking”

You can carry out a quick change to the function **Wall opening** with a direct transfer of the parameters by SmartClicking. By keeping the **Shift** key pressed down you move the mouse pointer over the opening. The opening is marked when the mouse is placed over it and the mouse pointer changes its form from an arrow to an index finger. By clicking with the **center** mouse key on the opening, the additional icon toolbar of the function **Wall opening** directly transfers the appropriate setting.



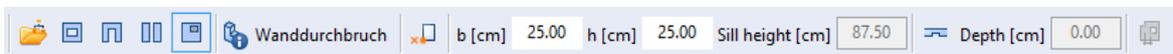
### 3D objects group: Wall opening

The function **Wall opening** has been expanded to include the options **Opening (F5)** and **Standard reference point**.

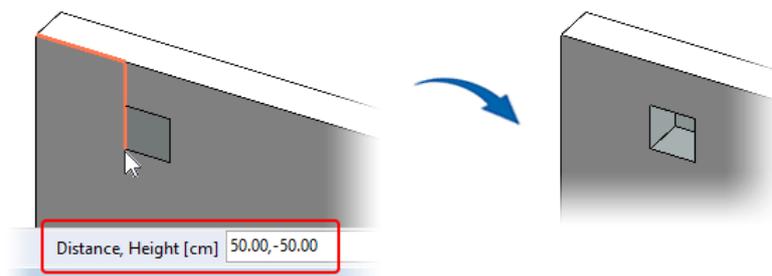


### Insert a breakthrough

The option **Opening (F5)** has been added to the wall openings:



Determine the reference point and then enter the position of the breakthrough in the status bar using the distance from and the height of the reference point. You determine the width and the height of the breakthrough in the additional icon toolbar.



You can create round and out-of-square breakthrough using a profile.

### Determine a reference point for the entry of a wall opening

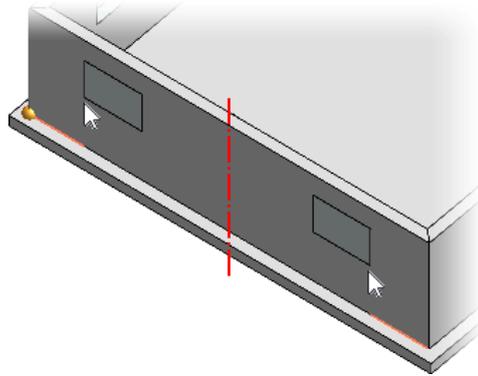
You can now determine the reference point of an opening when inserting a wall opening.



#### Standard reference point/Automatic reference point

Using the **Standard reference point**, you insert an opening using the distance from the zero point of the wall.

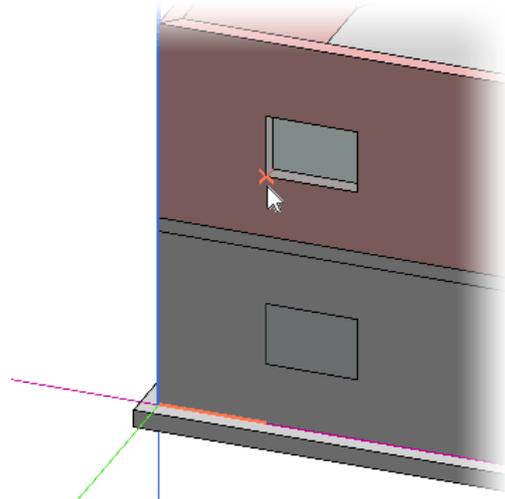
If you activate **Automatic reference point**, you can insert an opening at the opposite wall end without having to make long calculations. When the cursor is placed over the center of the wall, the reference point automatically changes its side and you can determine the distance.



#### User-defined reference point

Click on any reference point on the wall and determine the distance.

By pressing the **b** key, you can activate the directional snap, i.e. you can snap the point of an opening, for example, on a higher floor.

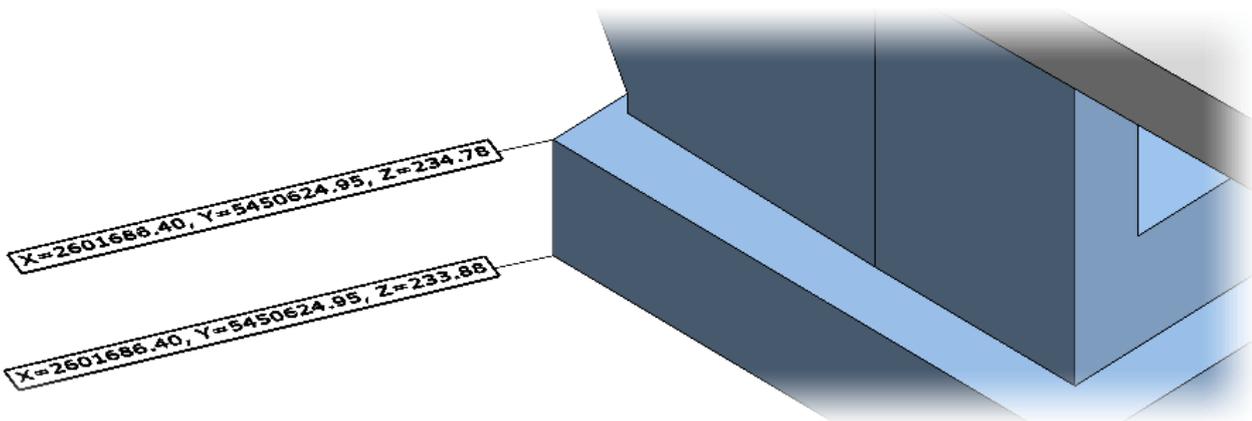


### 2D objects group: Point labeling



#### Point labeling

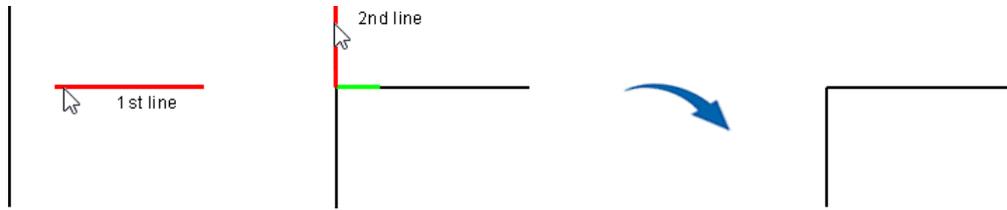
You can now label points of the construction for information purposes with coordinates which are based on the project coordinate system. Like objects, you can switch this labeling between show/hidden and transparent/opaque or assign it to a separate layer.



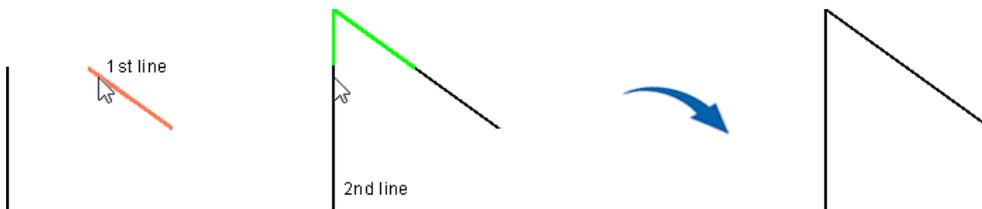
### Edit 2D objects by "SmartClicking"

You can now carry out the extending, shortening or connecting of 2D objects quickly by SmartClicking. Select the first line that you wish to edit by clicking on the beginning or end of the line. While keeping the **Shift** key pressed, select the second line. Both lines must be within one layer.

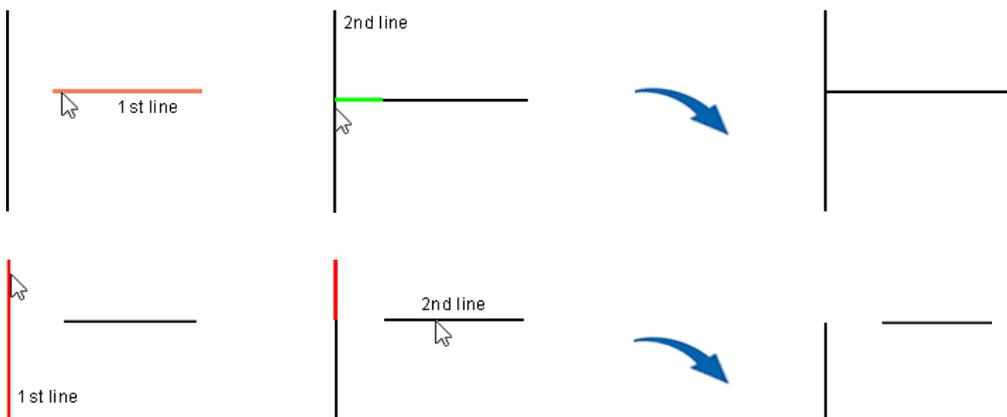
Selecting an outer area (beginning or end) of the second line connects both lines at a common point of intersection:



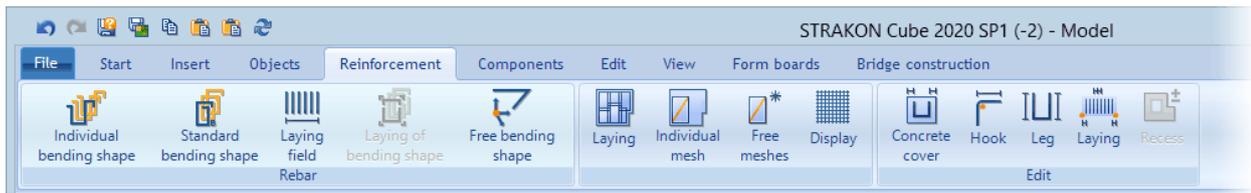
In doing this, the selected line is always shortened by the shorter part.



Selecting the center area of the second line results in an extension/shortening of the first line:



## Reinforcement Tab



The Cube reinforcement has been given new features in this version such as polygonal laying, laying of standard bending shapes, laying of multiple differing bending shapes, entry of a free bending shape, reinforcement coverage of an area using rebar and the saving of the reinforcement in 3D embedded parts and in Flex-Parts.

The icons have been given new designs and labeling:



**Create and lay individual bending shape**

(previously **Create (and lay) bending shapes**)



**Insert and lay a standard bending shape**



**Create laying in an area**

(previously **Lay selected bending shape**)



**Lay selected bending shape**

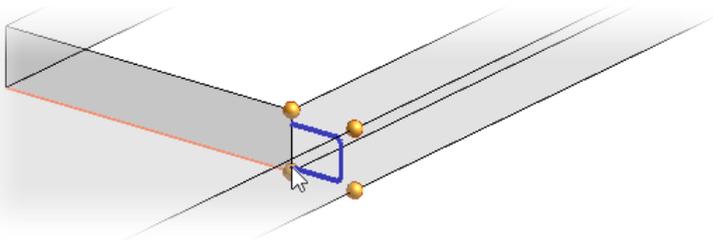
### ***Polygonal laying***

You can lay a bending shape, for example, a stirrup binder, as a polygon in the Cube reinforcement along multiple lines.



**Create and lay individual bending shape**

First, create a stirrup. The entry of the reinforcement points has been simplified. You no longer have to rotate the model if points are located behind an object at the time of selection.

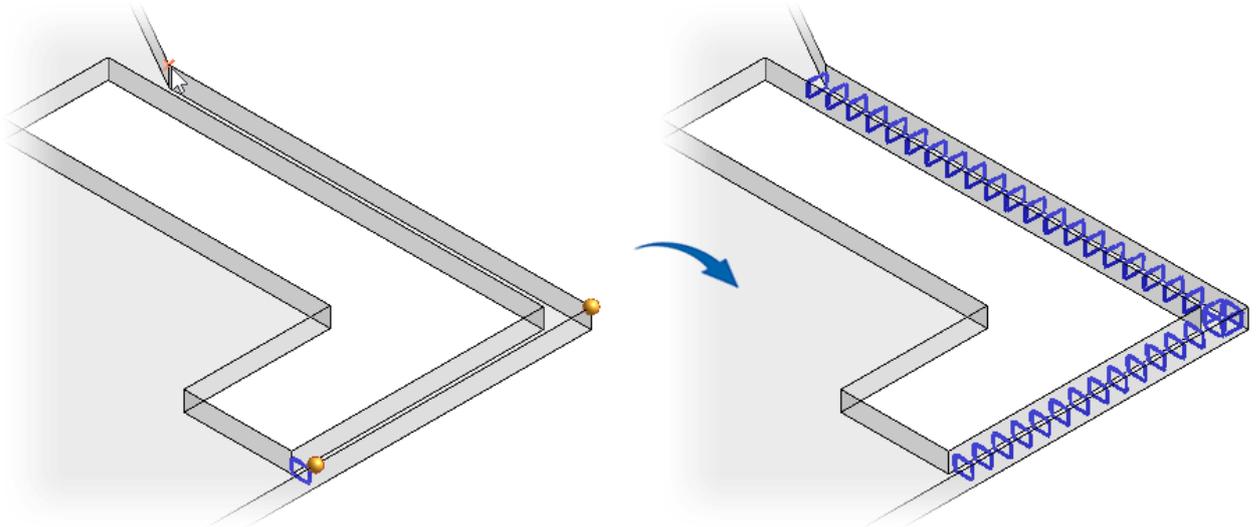


Then confirm the hook.

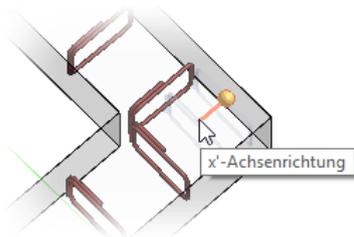
### Additional icon toolbar



After clicking on the icon **Polygonal laying (F4)** choose the start and end point for the polygonal laying of the stirrup along the layout path.



You can now delete or move individual bars in laying.

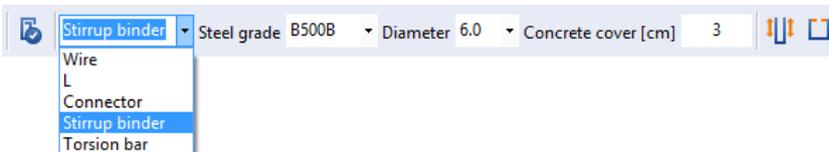


### Laying of a standard bending shape



Insert and lay a standard bending shape

### Additional icon toolbar

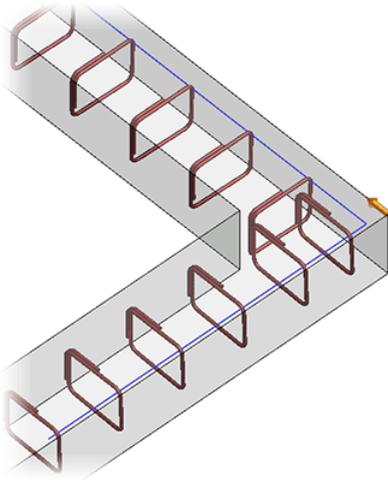


Standard bending shapes, such as a **wire**, **L**, **connector**, **stirrup binder** or **torsion bar** are offered for selection and can be laid in an object.

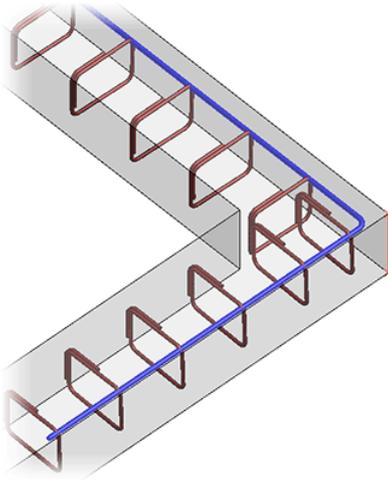


### Consider other reinforcement (F1)

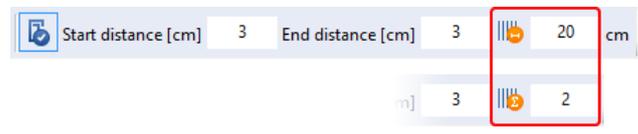
Once this function has been activated, existing reinforcement is taken into consideration during the laying of bending shapes. After ending this function, the reinforcement is displayed in position while taking existing reinforcement into consideration.



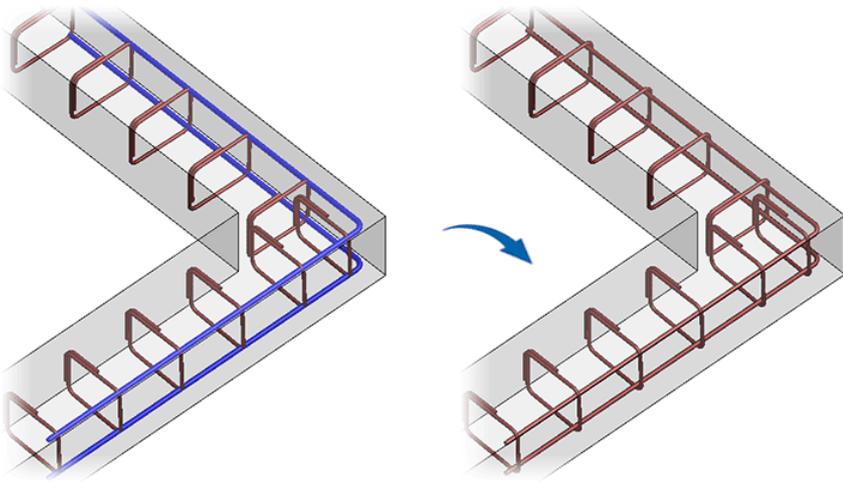
For the laying of an L-bar for example, you determine the first and second leg length using the additional icon toolbar.



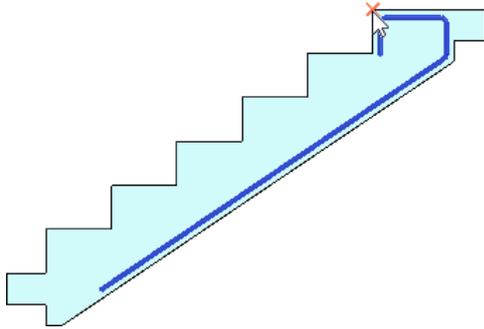
You no longer have to select any points for the laying area, only a line. You can then determine the distance or the number of bars using the additional icon toolbar.



After confirmation of this entry, the existing stirrup are detected and the L-bars appropriately positioned.

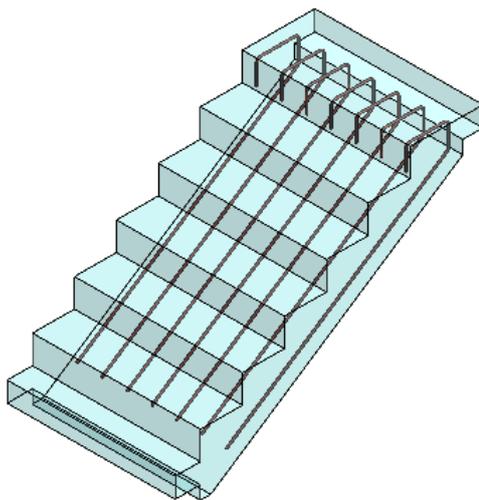


You are not required to determine a line for the laying of a bending shape within a component but rather now simply select the starting point of the layout path. When doing this, it is important that the starting and end point of the layout path are in alignment with one another in terms of the screen depth.



For an individual bending shape (see Polygonal laying, page 36) you can also work with a **leg modification** and **hook entry**.

For the laying of the bars along a line you can determine the distance at the beginning and end of the path and the distance between/the number of bars.

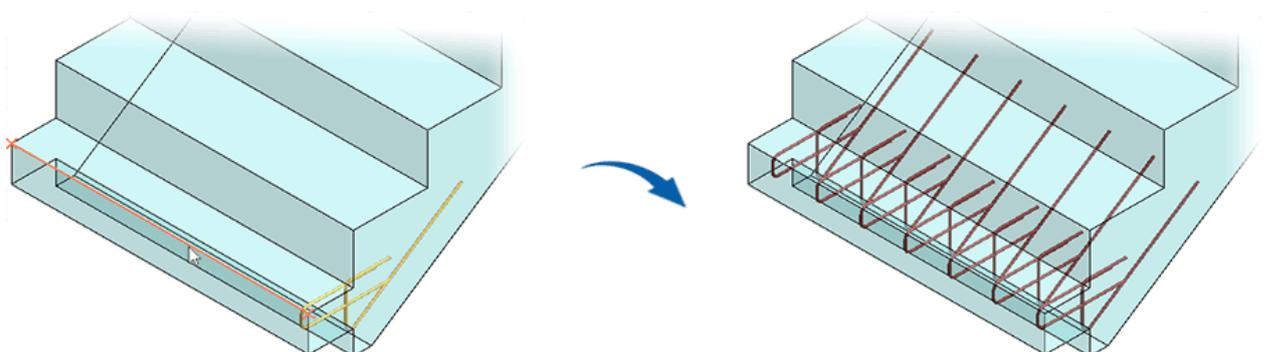


### Laying of multiple bending shapes



Lay selected bending shape

You select single and multiple differing bending shapes that have not yet been laid (multiple bending shapes by pressing and holding the **Ctrl** key at the same time) and lay them together along a line.

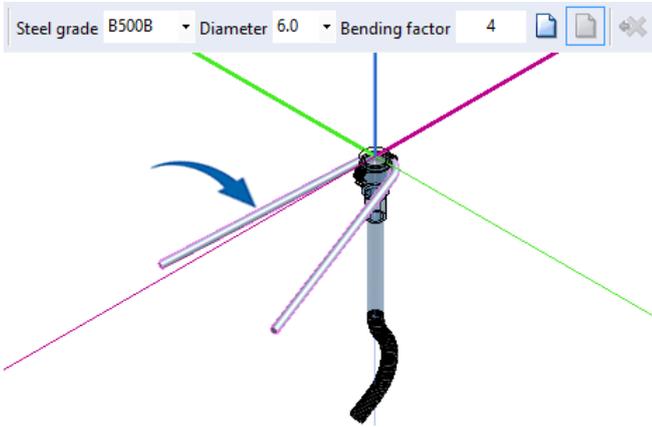


### Create free bending shape



#### Create free bending shape

You can create a bar freely in a room by entering coordinates, i.e. without any link to a point, or relatively, for example, from the corner of an object.

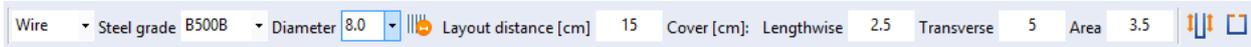


### Reinforcement coverage of an area using rebar



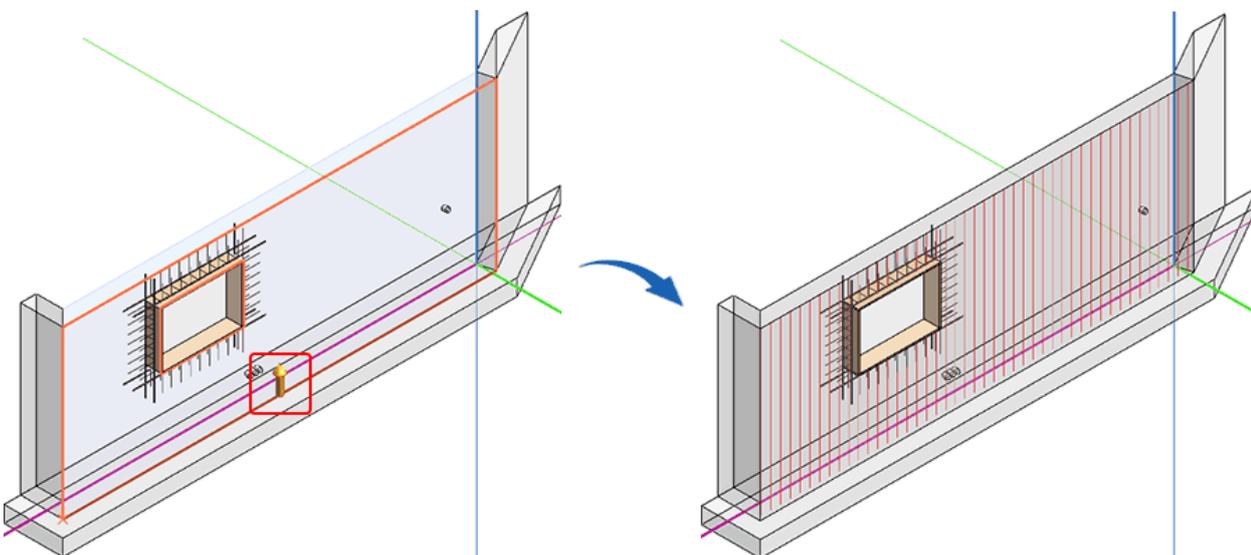
#### Create laying in an area

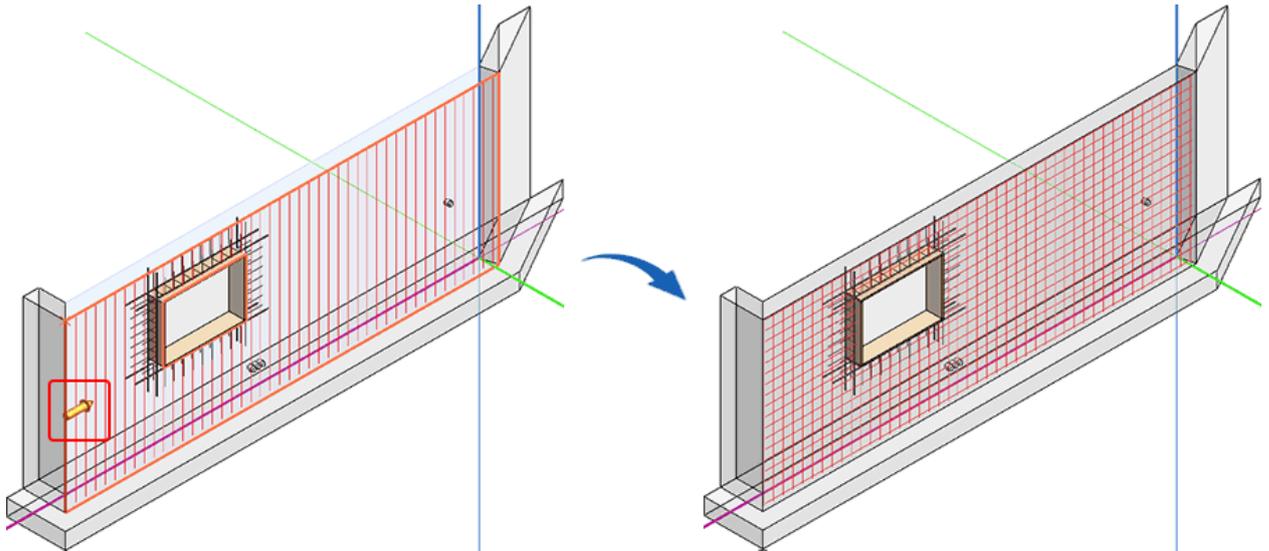
#### Additional icon toolbar



You can now lay reinforcement coverage of an area using rebar in Cube reinforcement. When doing this, openings are automatically detected and the reinforcement appropriately adjusted.

To lay coverage of an area using rebar, you determine relevant settings for the laying such as the layout distance, concrete covers etc. in the additional icon toolbar. Select the laying field. An arrow then appears in the direction of the bars.





## Components Tab

### **Change group: Save 3D embedded parts with reinforcement**

You can now save added reinforcement in a 3D embedded part e.g. using **Create free bending shape**.

Example: Lifting hook with a reinforcement loop



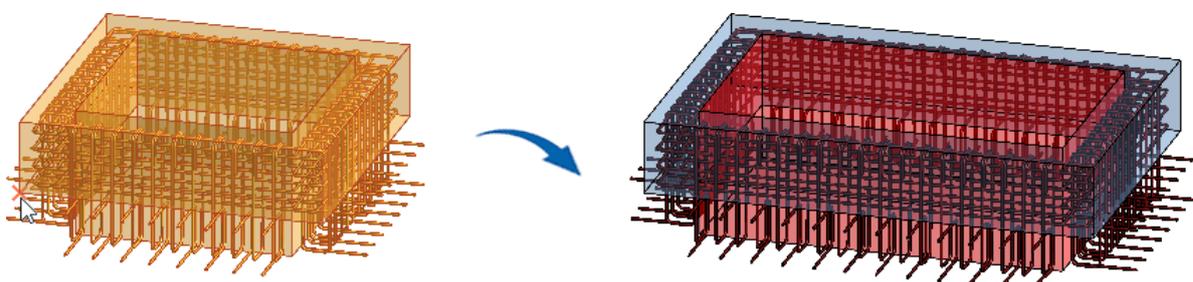
### **Convert group: Save selection**

The function **Save selection** has been expanded to include the options **Save in library (F4)** and **Define the coordinate system for the component (F6)**.



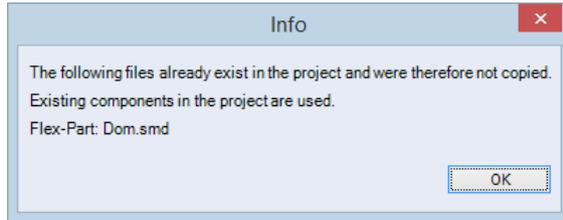
### **Save in library (F4)**

You can now save various objects, such as Cube reinforcement, embedded parts, subtractions and 3D objects, to a Flex-Part. Select the objects and determine the reference point. These objects are saved as a complete Flex-Part in the Flex-Part library.



When inserting this Flex-Part (with existing embedded parts) from the library, a message may now appear that you have already inserted this object and that it was not copied. In this case, the file name was checked and not the geometry.

You can now decompose the Flex-Part before positioning it. You can then change individual objects, such as Cube reinforcement, subtractions etc. During a change, for example, as a result of moving points, all objects are appropriately adjusted.



### Define the coordinate system for the component (F6)

Irrespective of the active coordinate system in **Cube**, you can define a separate coordinate system for the reference/insertion point of a component.



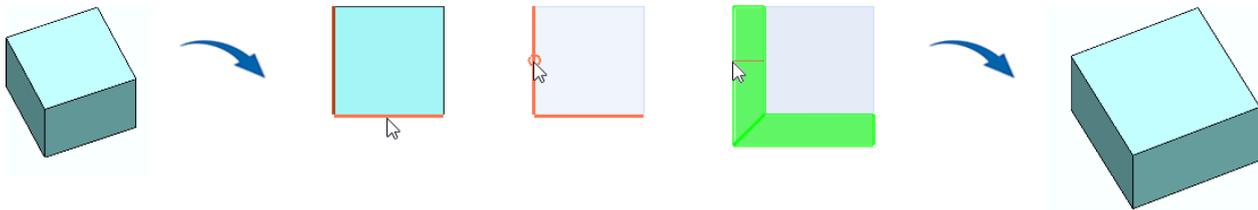
After activating the function and selecting the insertion point, choose between the definition of the x-/y- or x-/z-axis.

## Edit Tab

### Modeling group: Extrude areas

#### Select object lines

You no longer have to be working in the perspective in order to select an area for extrusion. For quicker working, now only click in a view, for example, top view, on the appropriate lines of the areas which are intended to be extruded. Then confirm the selection by right-clicking, determine the reference point and the size of the desired area.



### Cling with joint

When making an area cling, you can determine that a joint is placed between the objects.

#### Additional icon toolbar

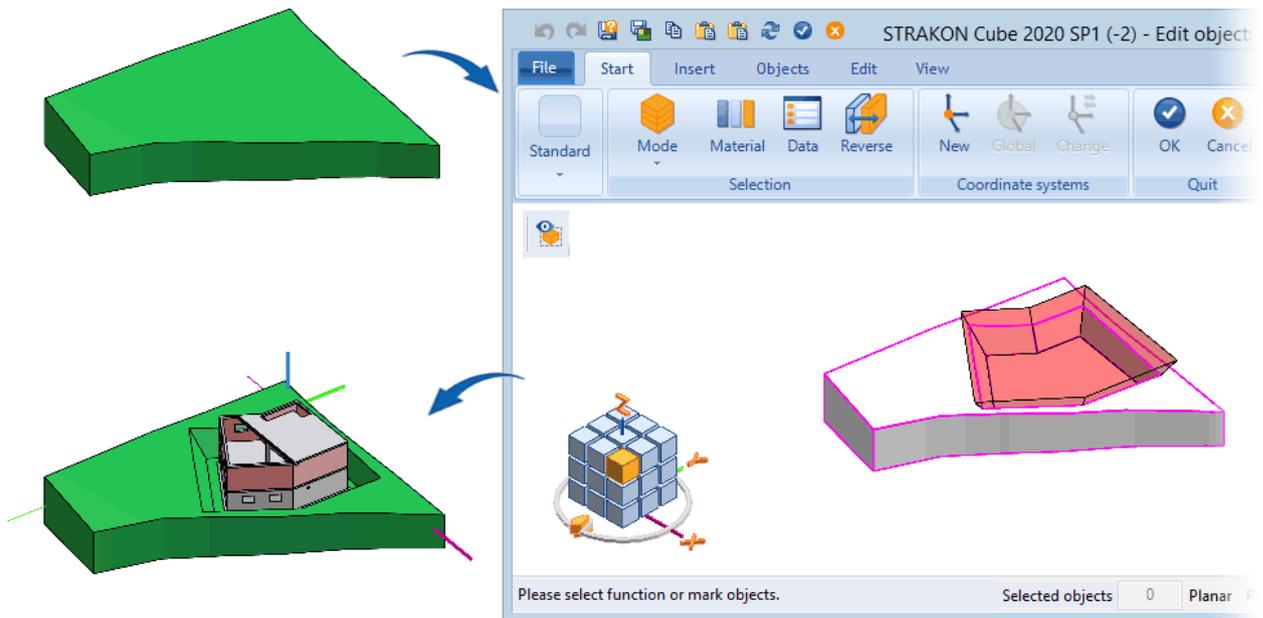


**Modeling group: New function “Edit object”**



**Edit object specific negative and additional objects**

The new function **Edit object** enables you to add additional objects, such as a negative object or an additional object, to an existing object. A negative object only has an impact on the object to be edited and not on any additional objects which are inserted into the model. Mark the object and click on the icon **Edit object**. An additional Cube window then opens for editing:



You can subsequently also change the geometry of the added objects in this function.

**Walls group: “Edit” function expanded**

The additional icon toolbar of the function **Edit** has been expanded:



**Subdivide wall (F4)**



If you insert a cross-section into a wall, the wall is subdivided at this point into two parts, i.e. they are now two objects.

### Change group: "Data" function expanded

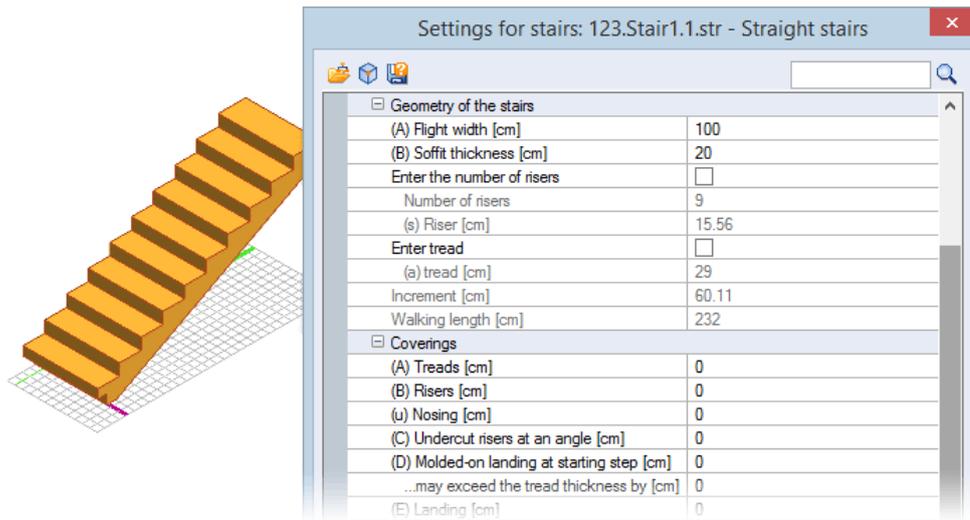
The additional icon toolbar of the function **Data** has been expanded to include the function **Change type parameter in dialog (F3)**:



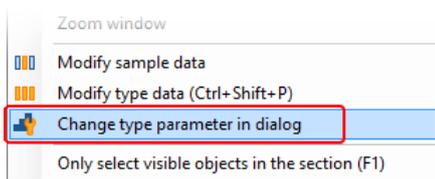
### Change type parameter in dialog (F3)



You can now change a selected 3D object of the type "stair", "ramp" and "stairway" using the dialog:



The context menu has been also expanded to include this function:



## View Tab

### Display group

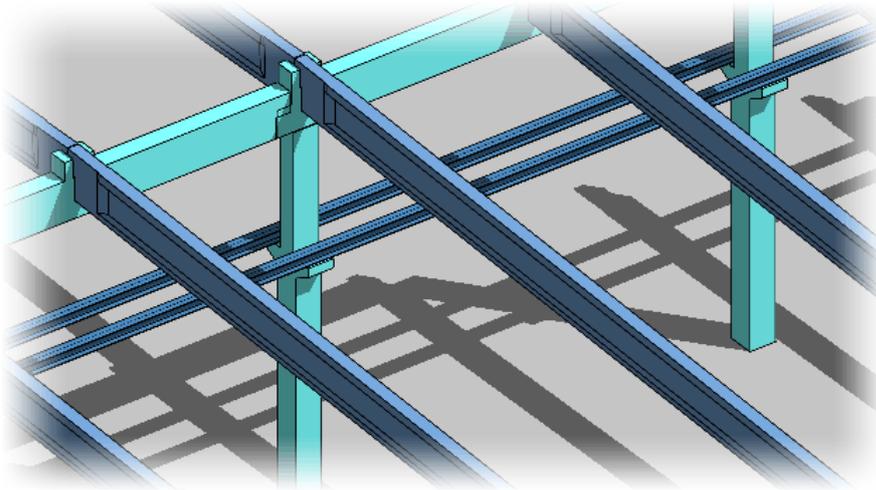
The icons **Save** and **Load** have been moved from the **Display** group into the **Scene** group. The tooltips are now:

Icon **Save**: Save current scene (view/section, display + zoom)

Icon **Load**: Load scene

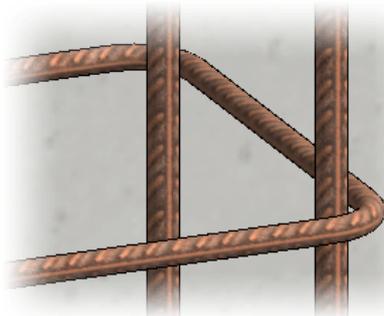
### Display group: *Shadowing in a model*

In order to give a realistic display of a model you can now also activate/deactivate a shadow using the icon **Style**.



### Reinforcement display with texture

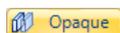
In order to give an optical improvement reinforcement has now been given a display of the surface structure via a texture.



### Display group: *Transparent/opaque*



Display selection as transparent activated/deactivated (T)

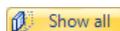


Display as opaque all objects shown as transparent (Shift+T)

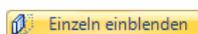
You now activate or deactivate transparency for selected objects using the function **Display selection as transparent activated/deactivated (T)**.

If no components are marked, you can deactivate the transparency of all components using the function **Display as opaque all objects shown as transparent (Shift+T)**.

### Display group: *Show all/Show individual objects*



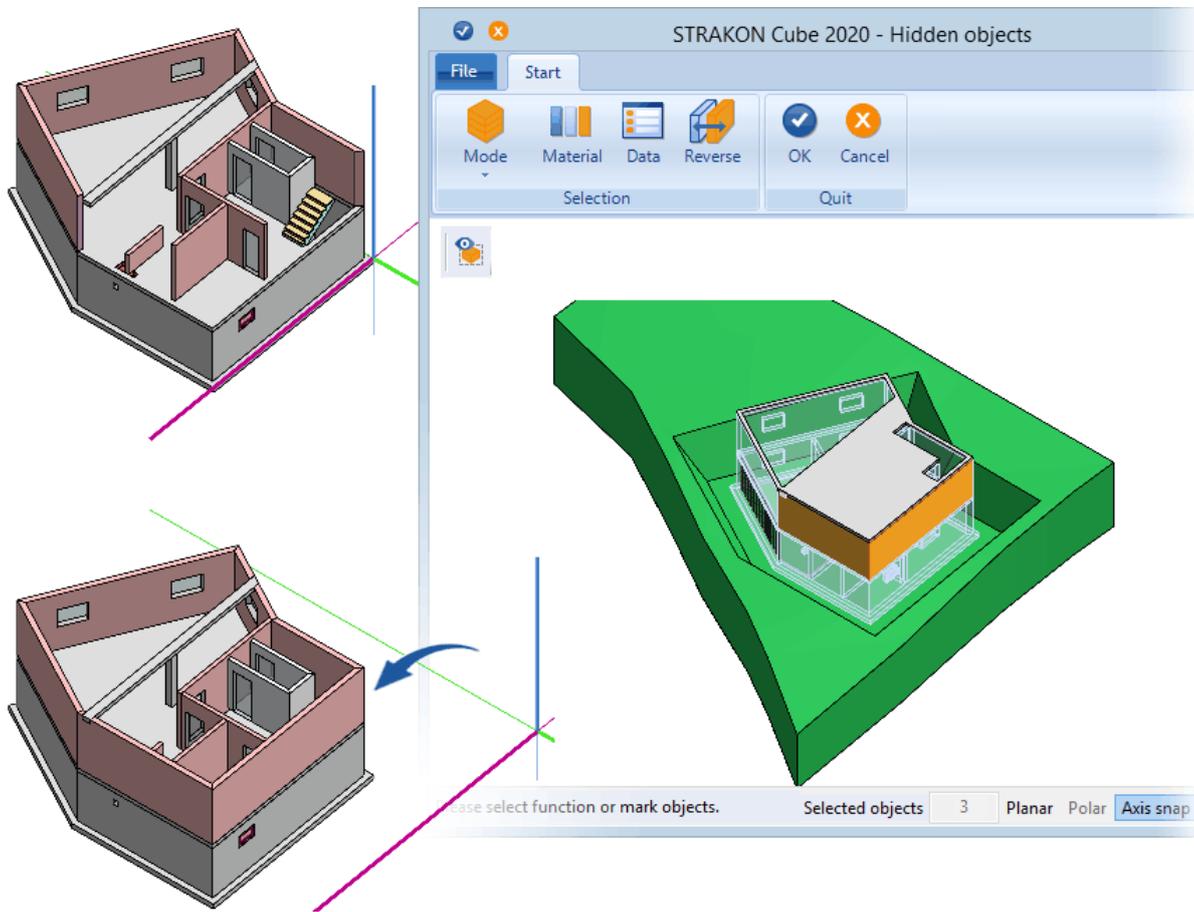
Show all hidden objects again (Shift+H)



Show individual hidden objects again (Ctrl+H)

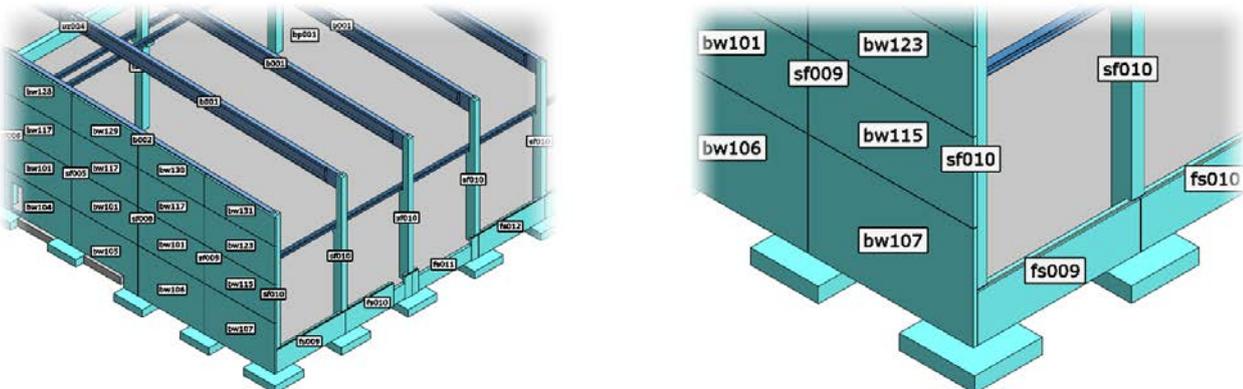
You now show all hidden objects again using the function **Show all**.

You can now also show **individual** hidden objects again. After clicking on the function **Show individual objects** an additional dialog box opens in which all hidden objects are highlighted in their material color. You mark those objects that are intended to be shown again and, after confirmation with **OK**, the dialog box closes and the selected objects are visible once more.



### Display group: Labeling of components

The name under which both a Flex-Part and a 3D embedded part has been saved is now positioned centrally on a component. The labeling is adjusted to match the zoom section.

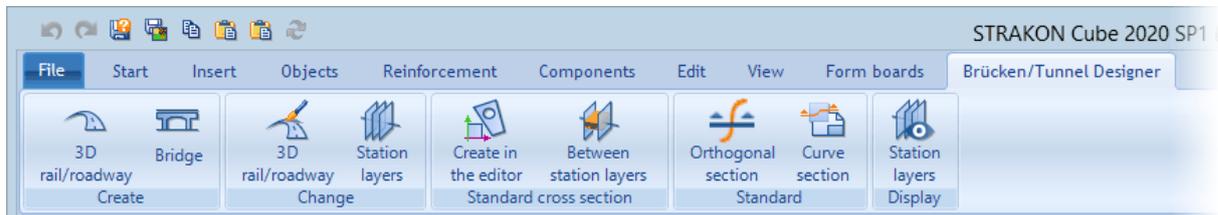


### Form Boards Tab

You no longer have to rotate a 3D part which has been modeled in STRAKON or loaded by IFC, for example, a balcony, to the fill side for concrete.

## Bridge Construction Tab

The creation of a bridge construction in **Cube** has been given a new concept in this version. For this purpose, the menu ribbon has been expanded to include the **Bridge construction** tab. In addition to the new functions for the creation and correction of a bridge superstructure, the familiar function **3D rail/roadway** may also be found here:



### Create group: 3D rail/roadway/bridge



Insert a 3D rail/roadway

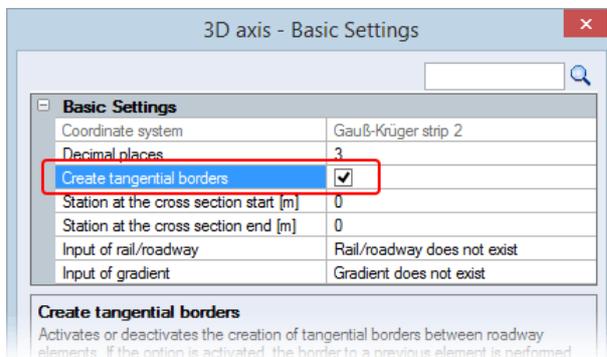
The settings have been revised:

#### Coordinate system

If you have chosen a type for the coordinate system (UTM or Gauß-Krüger) for a 3D project, this type is specified for the project and the 2D (segments). The subsequent loading of another type of data into this project is not possible. When using world coordinates (UTM and Gauß-Krüger), a scale factor of **1** is always used by STRAKON.

#### Create tangential borders

By activating the option, the borders between straight lines and clothoids are executed tangentially.



Create a bridge

Mark a 3D rail/roadway in a model for the creation of a bridge superstructure. After this, a dialog box opens for determining station layers. Inserted station layers enable a subsequent modification of the positioning and modeling of a bridge superstructure. At least two station layers are necessary for a bridge superstructure.

0/11	Label	Station [m]	Angle [gon]	Layer type	Parallel to	Distance [m]
	T(1), Ende Kappen	37.56558	108.55783	Separation la...	K(1), Kreuzung mit Bach	-12.397
	T(2), Hinterkante Kammerwand 10	40.90837	106.25720	Separation la...	K(1), Kreuzung mit Bach	-9.077
	T(3), Hinterkante EQT 10	41.31022	105.98063	Separation la...	K(1), Kreuzung mit Bach	-8.677
	10	42.16363	105.39328	Axis layer	K(1), Kreuzung mit Bach	-7.827
	K(1), Kreuzung mit Bach	50.00000	100.00000	Crossing layer		0
▶	T(5), Vorderkante Widerlager 20	57.98291	94.50586	Separation layer	K(1), Kreuzung mit Bach	7.973
	20	58.58532	94.09126	Axis layer	K(1), Kreuzung mit Bach	8.573
				Separation layer	K(1), Kreuzung mit Bach	
	T(6), Hinterkante EQT 20	59.43937	93.50347	Crossing layer	K(1), Kreuzung mit Bach	9.423
	T(7), Hinterkante Kammerwand 20	59.84156	93.22667	Separation la...	K(1), Kreuzung mit Bach	9.823
	T(8), Ende Kappe Ost	63.54940	90.67479	Separation la...	K(1), Kreuzung mit Bach	13.501
	T(9), Ende Kappe West	63.74755	90.53842	Separation la...	K(1), Kreuzung mit Bach	13.697
*						

DICAD

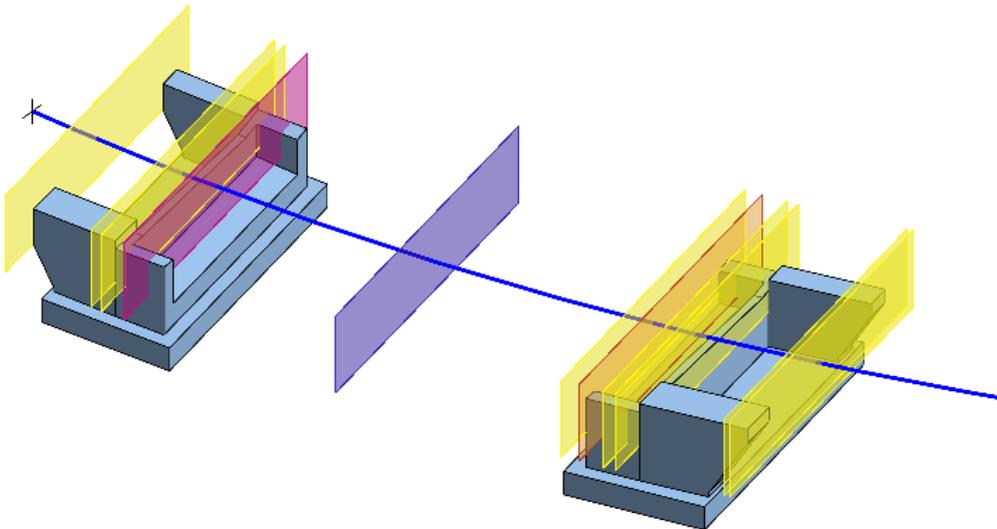
Apply OK Cancel

Three layer types, that mark certain stations in a bridge superstructure, are available for selection for the positioning of the station layers:

Axis layer (magenta): determines e.g. the axis of an abutment or a column bearing

Separation layer (yellow): marks e.g. an additional layer for the strengthening of an abutment

Crossing layer (blue-lilac): marks e.g. the traversing of a road or rail track



The station value is calculated from the starting point of the route which is marked with a cross. A station layer is always created perpendicular (100 gon) to a route. You can correct this traversing angle as you wish. You can create parallels for every layer. You choose the reference layer and determine the distance for this. A negative distance value is executed from the reference layer in the direction of the start point and a positive distance value in the opposite direction. The angle of the parallels to the route is automatically calculated after confirming with the Apply button and is then transferred into the table.

By pressing the **Apply** button, the station values are sorted in the table in ascending order with regard to the start point of the route. If you leave the dialog box with **OK**, the station layers are displayed in the model.

**Change group: Edit a 3D rail/roadway/station layer**

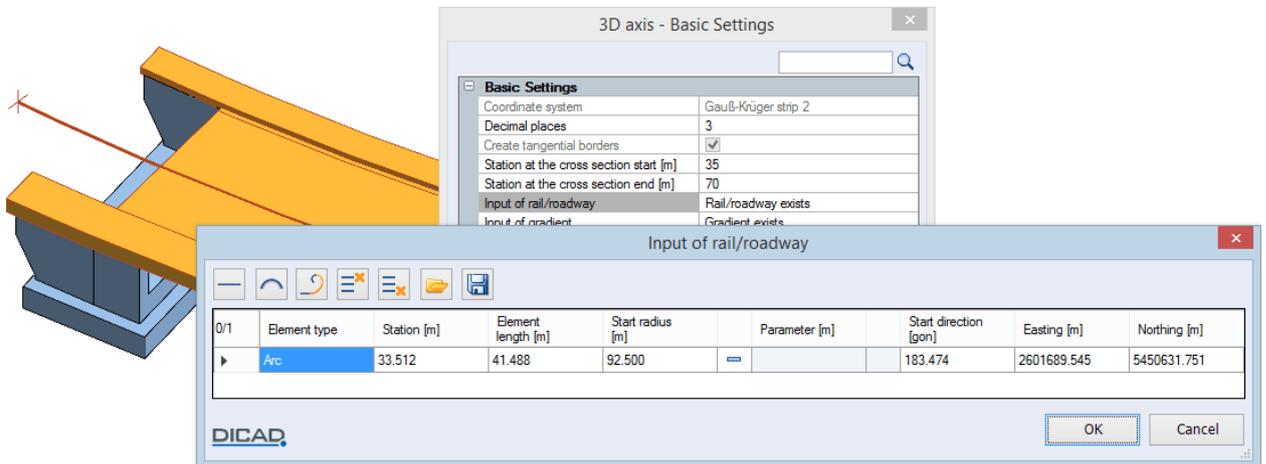
You can now also subsequently correct both the rail/roadway data and the station layers using the icons of the **Change** group.



**Edit a 3D rail/roadway**



**Edit station layers**



**Standard bodies group: Standard cross section**

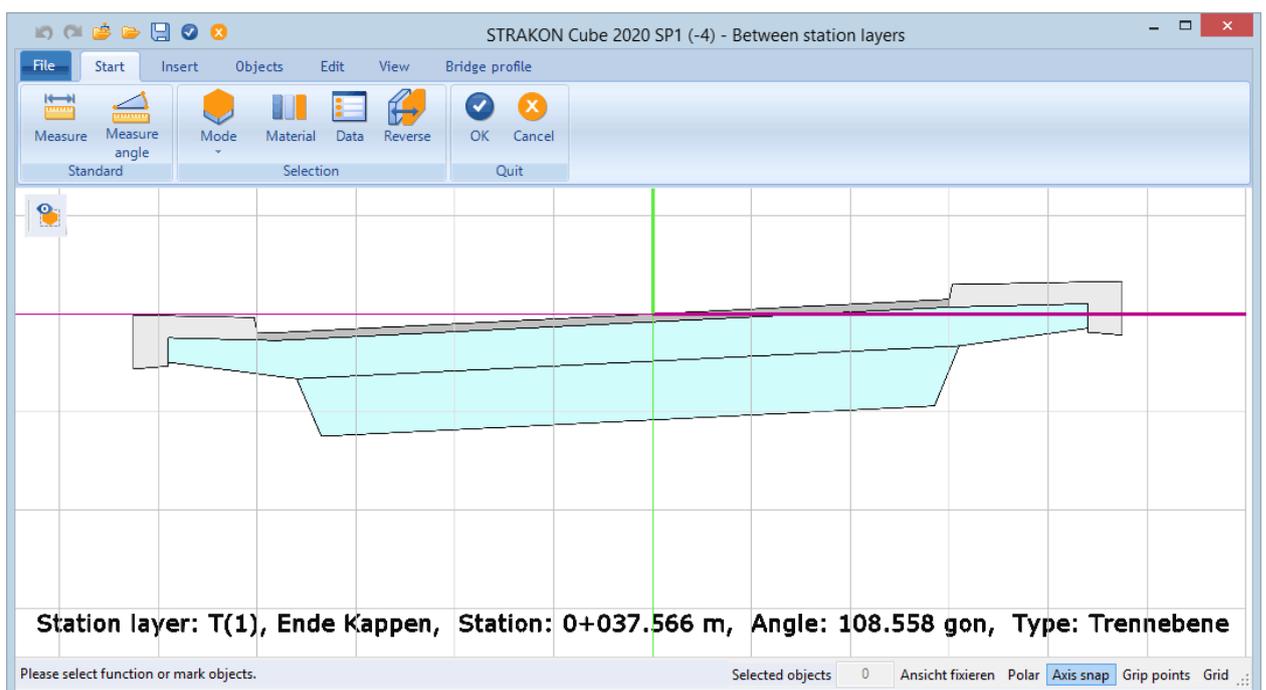


**Between station layers**

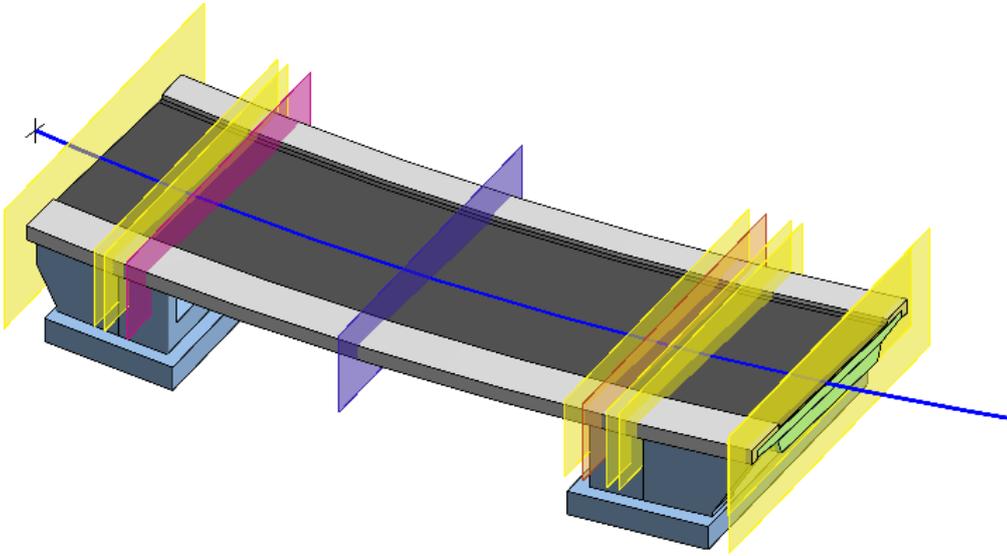
To define a standard cross section, choose two station layers in order to insert the cross section between these layers. An additional Cube window is opened. Here you construct the profile for the standard cross section, for example, using 2D objects, or you open a profile in the administration.



**Open profile**



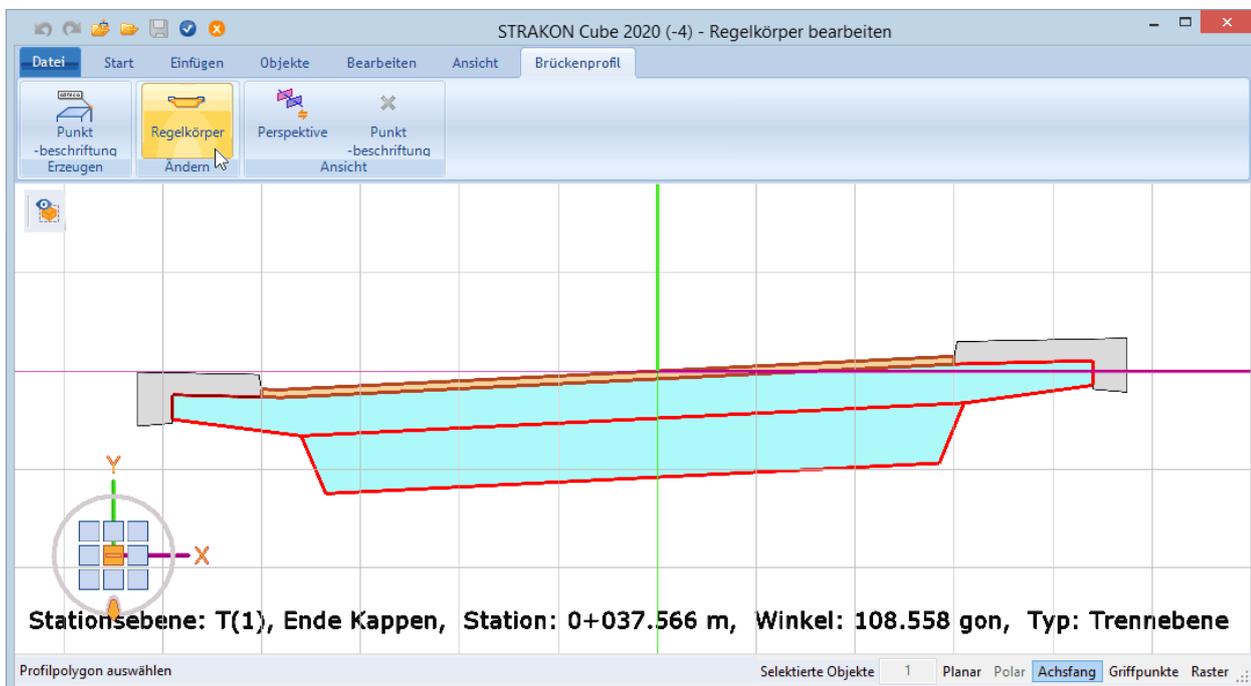
After confirming with **OK**, the standard cross section is executed between the chosen station layers. The standard cross section is positioned orthogonally to the rail/roadway.

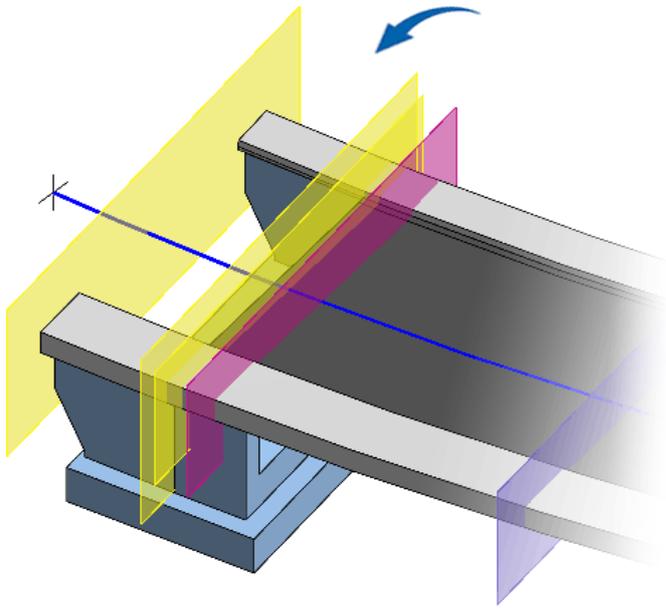


Now you can use the station layers to subsequently model the bridge. The body of the bridge construction can be separated between the layers, individual profiles can be deactivated or further ones added.

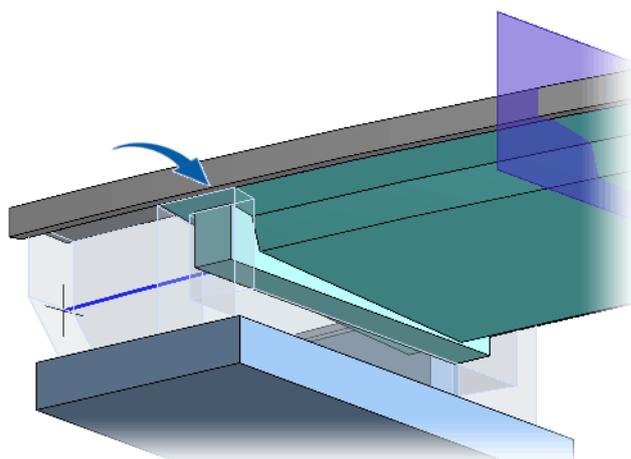
In order, for example, to remove the superstructure body between the edges at the start of the bridge, choose the two separation layers at the start of the bridge.

You click on the **Standard body** function in the **Bridge profile** tab. Select the polygons that are intended to be removed. They are marked in red and after confirming with **OK** the superstructure body is removed in the area between the chosen layers. Only the edges remain.





You can also add further profiles into the bridge superstructure using the bridge editor. If you wish to expand, for instance, the abutment at the end cross member to include strengthening, select two layers once more. In the bridge editor you draw an additional profile using a line polygon and then assign a material to it.



## 3D Objects

### Export Additional Schedules

The menu **3D design > 3D objects** has been expanded to include additional schedule exports. You can summarize a schedule of all objects according to part type and sort all objects according to the existing project structure.

3D object: Schedule | Labeling schedule | **Part type schedule** | Project structure schedule | Room Schedule | Room labeling schedule

#### Part type schedule

3D-Objektliste Teileart				
Piece	Part type	Total volume [m³]	Total weight [t]	Total surface
6	Dachbinder I-Querschnitt	1.26	3.18	
1	Fundament	1.08	2.7	
2	Stütze	0.08	0.02	

#### Project structure schedule

In a similar way to the project structure, the objects inserted on the floor in question are listed in this schedule.

3D-Objektliste mit Projektstruktur											
Name	Beschreibung	Haus	Geschoss	Raum	Volumen [m³]	Gewicht [t]	Oberfläche [m²]	Materialien	Teileart	Abzugsobjekt	Verdrängungsobjekt
Gründung											
KF001		Wohnhaus A	Gründung		1.08	2.7	6.48	C25/30	Fundament	Nein	Nein
Summe: 1					1.08	2.7	6.48				
Obergeschoß											
S001		Wohnhaus A	Obergeschoß	Raum 2	0.037	0.013	0.675	VH C24	Stütze	Nein	Nein
S001		Wohnhaus A	Obergeschoß	Raum 2	0.037	0.013	0.675	VH C24	Stütze	Nein	Nein
DB001		Wohnhaus A	Obergeschoß	Raum 1	0.21	0.525	3.62	C20/25	Dachbinder I-Querschnitt	Nein	Nein
DB001		Wohnhaus A	Obergeschoß	Raum 1	0.21	0.525	3.62	C20/25	Dachbinder I-Querschnitt	Nein	Nein
DB001		Wohnhaus A	Obergeschoß	Raum 1	0.21	0.525	3.62	C20/25	Dachbinder I-Querschnitt	Nein	Nein
DB001		Wohnhaus A	Obergeschoß	Raum 1	0.21	0.525	3.62	C20/25	Dachbinder I-Querschnitt	Nein	Nein
DB001		Wohnhaus A	Obergeschoß	Raum 1	0.21	0.525	3.62	C20/25	Dachbinder I-Querschnitt	Nein	Nein
DB001		Wohnhaus A	Obergeschoß	Raum 1	0.21	0.525	3.62	C20/25	Dachbinder I-Querschnitt	Nein	Nein
Summe: 8					1.34	3.2	23.08				

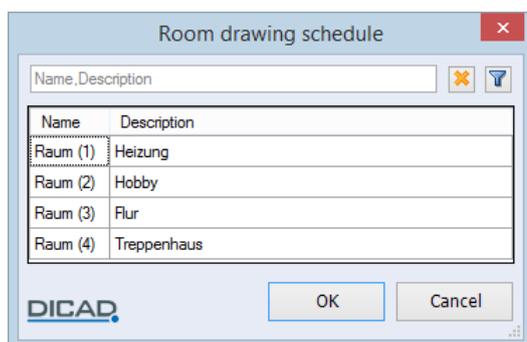
Using the functions **Room schedule** or **Room labeling schedule** you can position a schedule both of all rooms and of all labeled rooms in 3D views on a drawing (see 3D Views, Label Rooms, page 55).

#### Room schedule

Raumliste					
Bezeichnung	Stockwerk	Flächentyp	Grundfläche [m²]	Umfang [m]	Höhe [mm]
Heizung	KG	Technikfläche	18.239	16.880	2550.000
Hobby	KG	Nutzungsfläche	29.123	22.634	2550.000
Summe:			47.000		

Alternatively, you can also export these schedules directly to an XLSX file using the menu **3D design > 3D object schedules**.

The additional function toolbar has been expanded to include the function **Room drawing schedule** via which you are given an overview of all rooms created in a drawing or model.



## Flex-Parts/Objects

### Export an Additional Schedule

The menu **3D design > Flex-Parts** has been expanded to include an additional schedule export. You can summarize a schedule of all Flex-Parts according to part type.

Flex-Part: Create | Modify | Place | Type schedule | Sample schedule | Labeling schedule | **Part type schedule**

#### Part type schedule

Flex-Part schedule part type				
Piece	Part type	Total volume [m³]	Total weight [t]	Total surface area [m]
4	Beam	29.087	72.718	181.229
31	Column with foundation	263.314	658.274	1588.728
3	Cladding panel single-wythe	13.178	32.946	145.189
3	Flight of stairs	3.574	8.937	41.638
1	Miscellaneous			
16	Roof truss I-profile	100.272	250.688	1350.512
4	Roof truss T-profile	26.644	66.612	316.762
1	Slab	557.113	1392.782	5639.911
17	Sandwich panel	31.686	65.017	698.669
5	Solid slab	19.576	48.942	209.623
77	Wall	288.805	722.007	3547.655

Alternatively, you can also export the schedule **part type** directly via the menu **3D design > Flex-Part schedules > Export part type schedule to Office (xlsx)** to an XLSX file.

### Maximum Dimensions in Tooltip

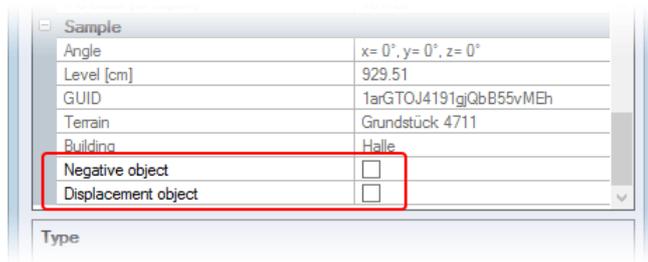
The maximum dimensions are exported in Tooltip in the x-/y and z-directions during the creation of Flex- Parts and embedded parts.

Name: SF010
Description:
Type: 3D object\Flex-Part
Volumes: 9.282 m³
Weight: 23.205 t
Surface: 55.698 m²
Materials: C35/45
Maximum dimension in x-direction: 300 cm
Maximum dimension in y-direction: 270 cm
Maximum dimension in z-direction: 1345.79 cm
Part type: Column with foundation
IFC class (for export): IfcColumn
Freigabe: No
Level: -178 cm
Angle: x= 0°, y= 0°, z= 90°
GUID: 3AUTtgI0LDW8vM5QUTy1io
Terrain: Grundstück 4711
Building: Halle
[Betsy] Produktionsdatum SOLL: 29.11.2019
[Betsy] Montagedatum SOLL: 16.12.2019
Negative object: No
Displacement object: No

The variables **BoundingBoxX**, **BoundingBoxY** and **BoundingBoxZ** are available for these values.

## Declare a Flex-Part/Embedded Part as a Negative or Displacement Object

You can now also declare a Flex-Part/embedded part as a negative or displacement object using the sample data.



### Note:

Please note that in this case, if these properties of, for instance, a 3D embedded part are supposed to have an effect on a Flex-Part, then the 3D embedded part must be saved in the Flex-Part.

## Change Common Type/Sample Data

You can now change the common type/sample data of different Flex-Parts in one step using the context menu or the Flex-Part administration.

## Stairway

### Stairway Planning and Entry of a Landing Revised

Both the planning of a stairway and the entry of a landing have now been designed for more comfort and are carried out graphically using **Cube**.

## 3D Views

### Recover/Restore a 3D View

You can now also recover or restore a 3D view that you have deleted or moved using the options **Undo/restore editing step**.



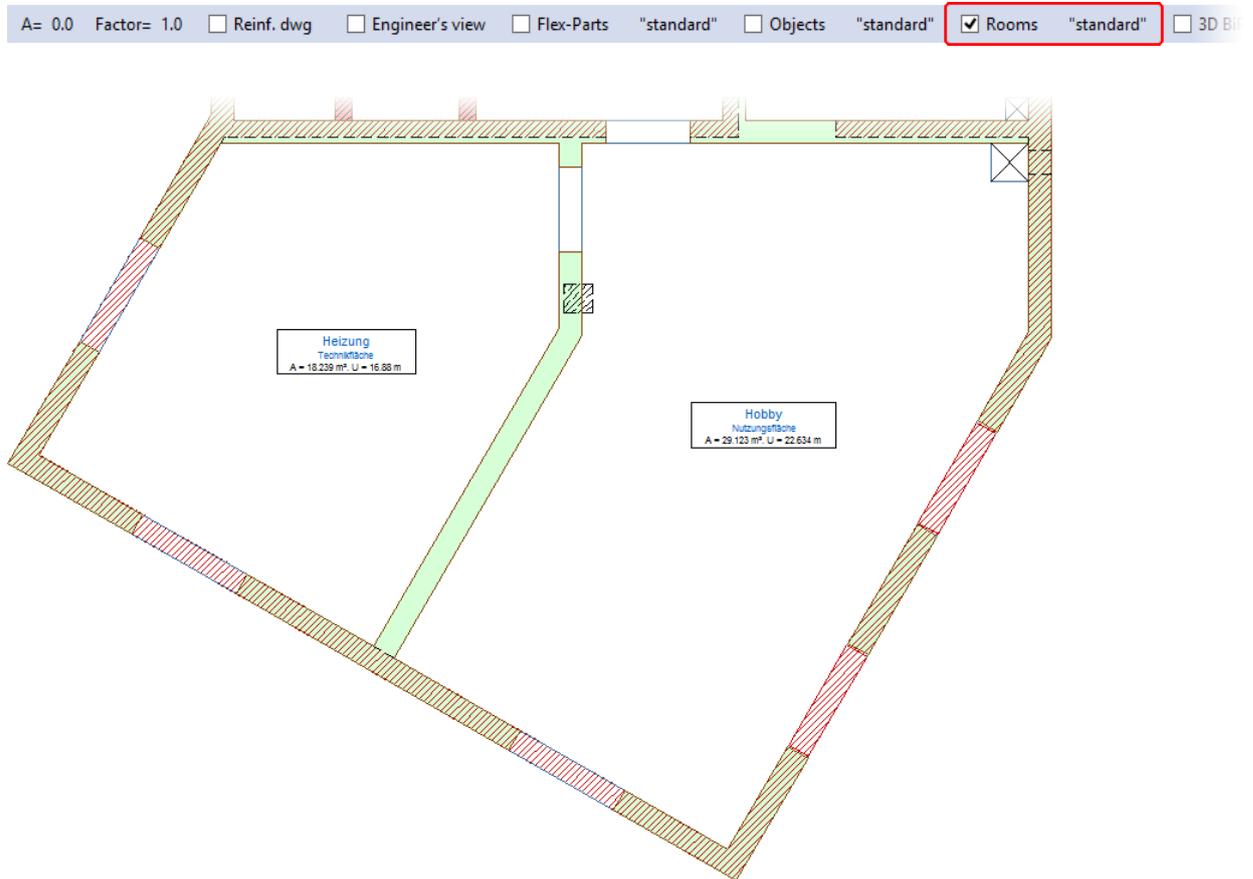
## Display a 2D Graphic Image

2D graphic images are deactivated as standard for export to a drawing. For a single view you can activate them during the export in the settings (additional function toolbar) using the option **Display a 2D graphic image** or later with the global modification function.

## Label Rooms

The labeling of rooms in a 3D view is possible. Automatic labeling takes place using the data which exist for the object (see function **Room**, page 30).

In order to label rooms, you activate the option **Rooms** and choose where necessary a labeling template in the additional function toolbar:



You can choose labeling templates for the labeling of a room and create new ones. Three labeling templates (**standard-Raum**, **standard-max-Raum**, **standar-min-Raum**) are supplied with the 2020 version.

Using the menu **3D design > 3D objects > Function toolbar Room schedule** or **Room labeling schedule**, you can place schedules of all rooms and all labeled rooms in 3D views onto a drawing.

### Room schedule

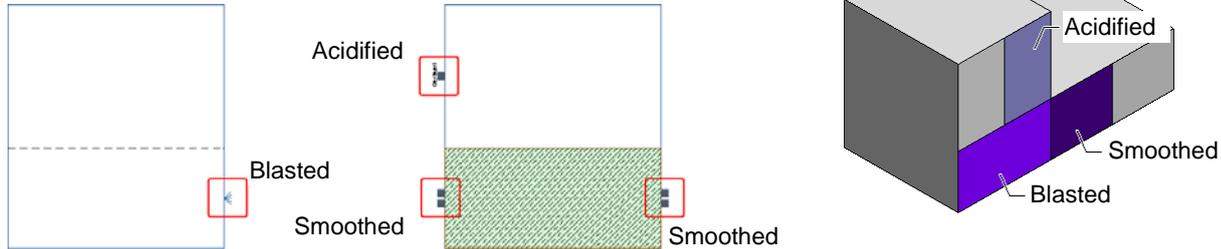
Room schedule						
Label	Story	Area type	Floor area [m²]	Circumference [m]	Height [m]	
Heizung	KG	Technikfläche	18.239	16.880	2.550	
Hobby	KG	Nutzungsfläche	29.123	22.634	2.550	
Sum:			47.362			

Alternatively, you can also export these schedules directly to an XLSX file using the menu **3D design > 3D object schedules**.

## Display Symbols on Surface Lines

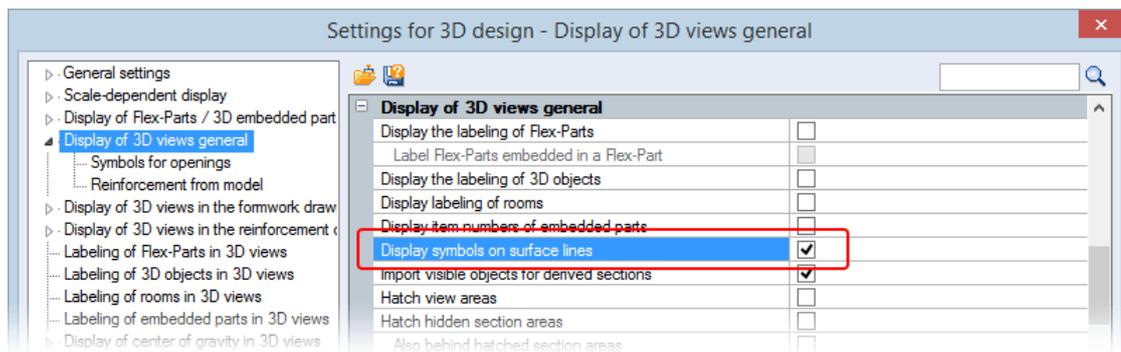
You can now mark surface section and view lines in 3D views with a symbol on the surface line. The properties of the surfaces in a 3D view can be recognized based on these symbols.

### 3D views



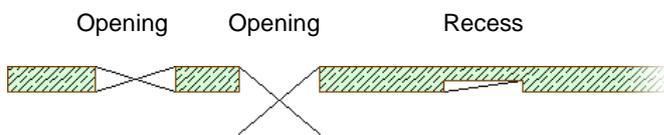
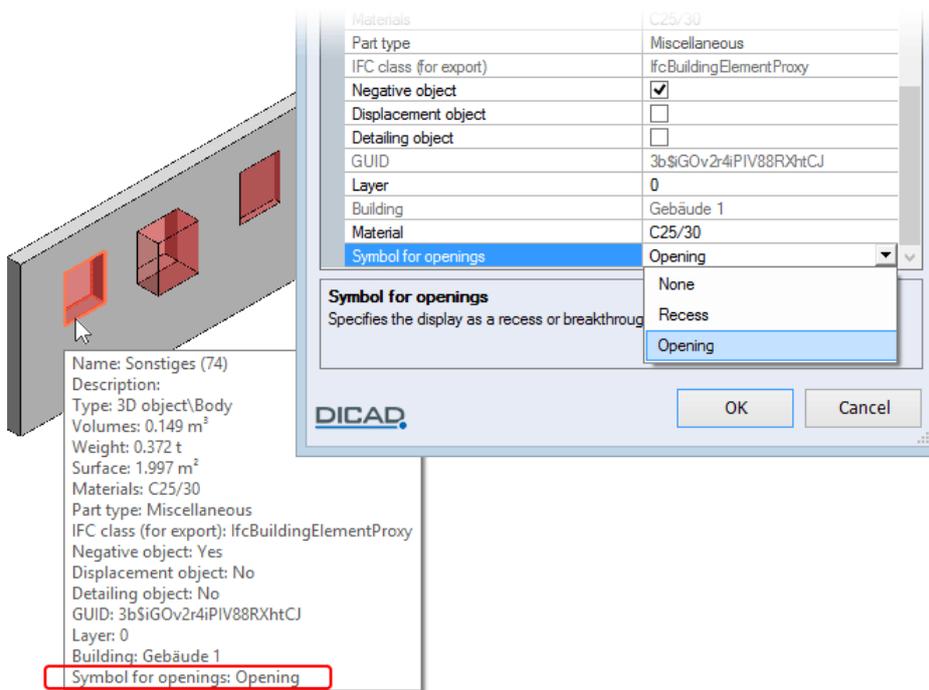
In the **surface administration** you can choose the surface line symbol using the new column **Symbol for line** in the symbol administration. Five symbols (**Maschinengeglättet**, **Gesäuert**, **Geschliffen**, **Gestrahlt** and **Schalungsboden**) are supplied with the 2020 version. They are stored in the user data directory `..\strakon\sym`.

The symbols are displayed on the section and view lines of a surface using the menu **Settings > 3D design > Display of 3D views general** by activating the option **Display symbols on surface lines**.



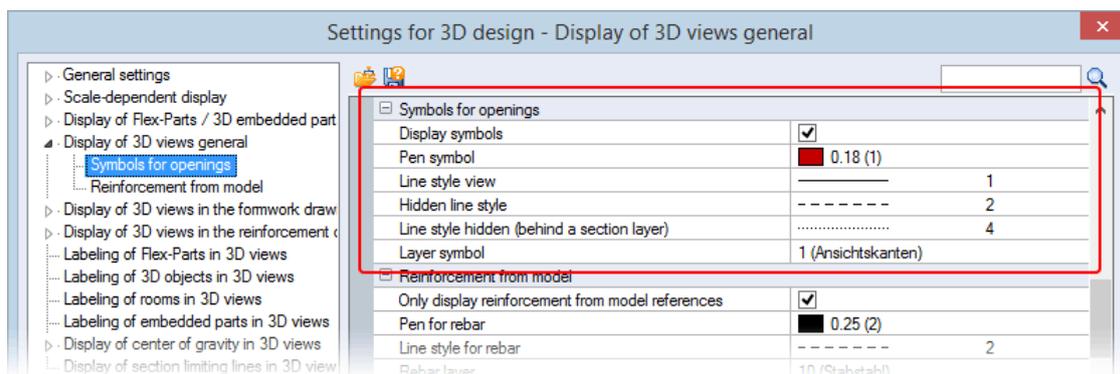
## Symbols for Openings

In the object data and using the option **Symbol for openings** you can choose what symbols should be used to display openings in a 3D view for objects with recesses and openings which are declared as negative objects.



The size of the symbol matches the size of the negative object. The name of the chosen symbol also appears in Tooltip.

Using the menu **Settings > 3D design > Display of 3D views general** using the option **Symbols for openings** you can determine whether the symbols are displayed in a 3D view and can select both the display and a layer.

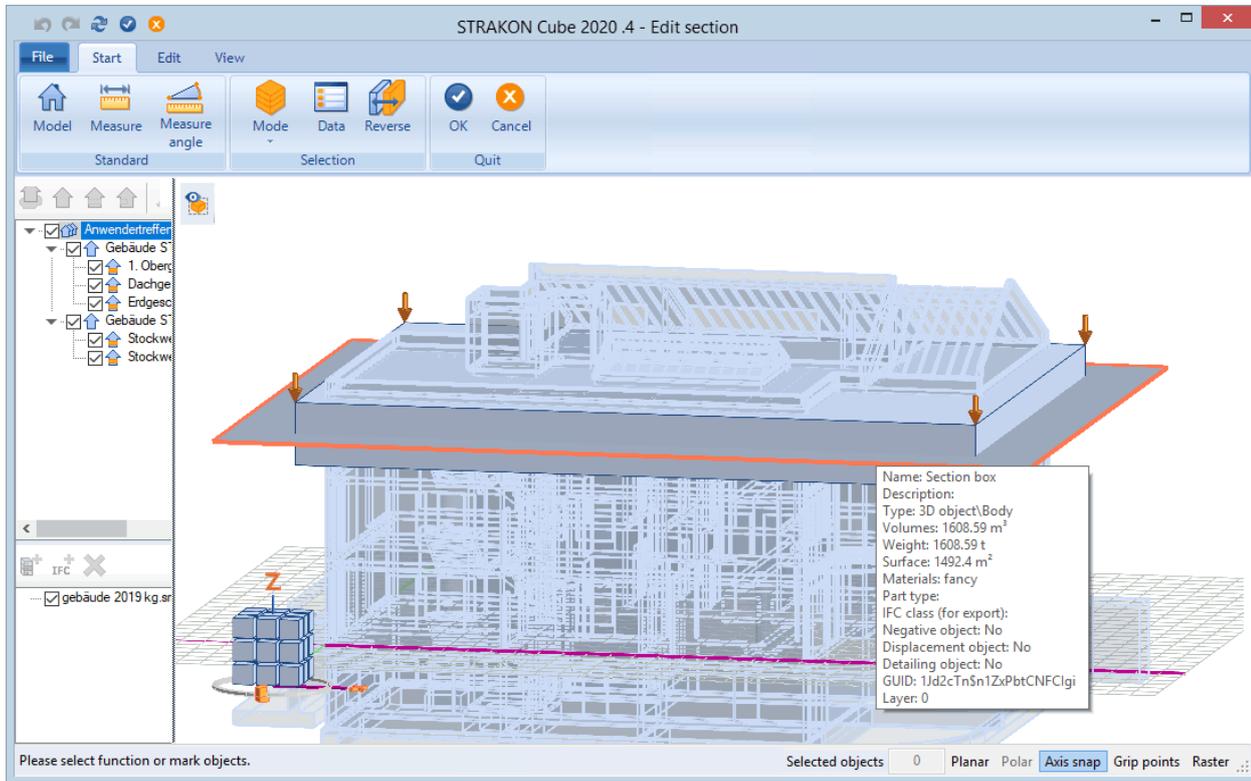


## Modify 3D Views

### Section box

Activate the option **Display objects** in the project structure if you wish to activate/deactivate individual objects in a view.

A defined section layer (export to a drawing by entering a section layer) is displayed as an area that you can move within its position.

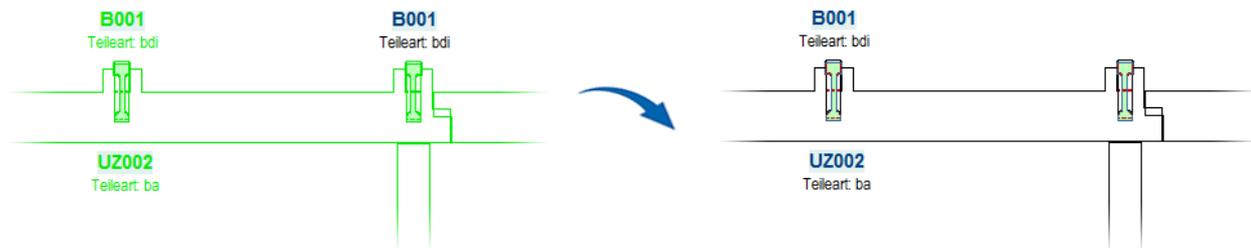


### Modify section lines by “New section”

You start the modification of section lines that have been created using **New section** by selecting a section line with the **Alt** key and the pointer symbol “C”. The modifications in this dialog box, such as the display of the section lines or the labeling, now remain even after updating the 3D views.

### Labeling: Display individually

You can now subsequently activate/deactivate the labeling of embedded 3D views individually. All labeling is displayed. Already displayed labeling is marked. Select any labeling that should be displayed. Labeling that is not chosen is deleted.



## 3D Embedded Parts

### Schedule Description Expanded

The text for describing an embedded part in a schedule (schedule description) has been increased to a maximum of 256 characters.

### Schedule with 3D Embedded Parts from Model References

As an option, you can integrate 3D embedded parts from model references into a schedule:



# Reinforcement

## Entering Reinforcement

### Number Variable Count View Bars

During the laying of variable bars, you can assign a bar number to the bars. If the marking type is requested, the new option **Bar numbers** appears in the additional function toolbar.

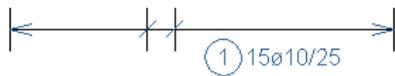
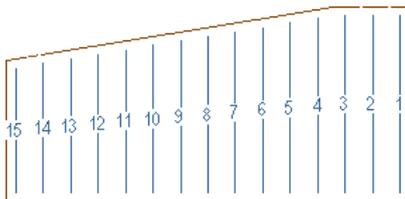
P=0.35 (3) Lsty= 1  1:1 disp.  Dimension texts  Bar numbers

The following options are available for selection in the function toolbar for the display of the bar numbers:

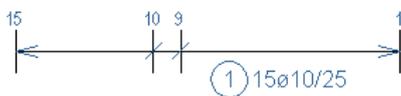
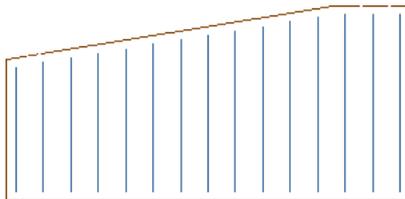
Display: > On bar lines < | On marking auxiliary lines (bar side) | On marking auxiliary lines (Other side) | On DIN end marks | No bar numbers

You can determine the pen weight, text height and angle of inclination. The font of the bar numbers is displayed in a similar way to the font in the schedules on the drawing (Menu **Settings** > **General settings** > **Drawing elements** > Option **Font schedules**). In order to avoid overlapping where there are small distances between bars, you can display the bar numbers **offset to one another**.

#### On bar lines



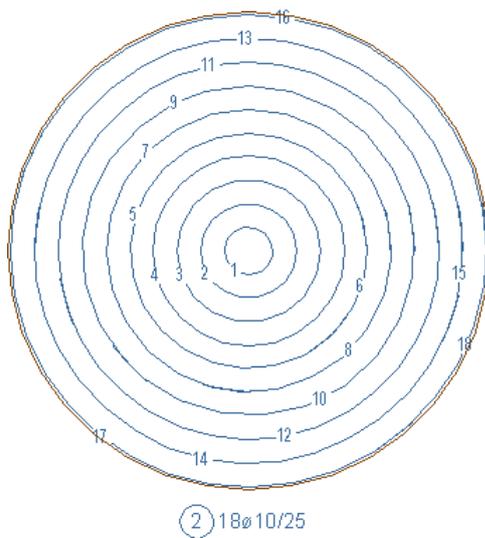
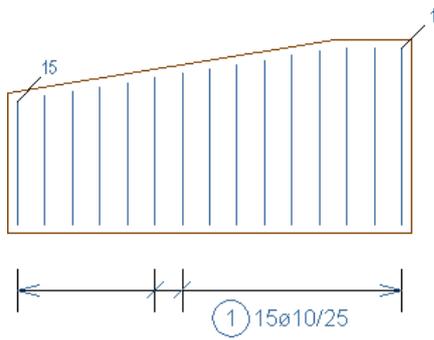
#### On marking auxiliary lines (bar side)



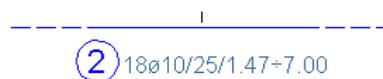
①	St	l(m)
1-3	3	1,640
4	1	1,615
5	1	1,573
6	1	1,531
7	1	1,489
8	1	1,447
9	1	1,405
10	1	1,363
11	1	1,321
12	1	1,279
13	1	1,237
14	1	1,195
15	1	1,153

$$\textcircled{1} 15\phi 10/25/1.15\div 1.64$$

**On DIN end marks**



②	St	l(m)	R(m)
1	1	2.052	0.247
2	1	3.604	0.494
3	1	5.156	0.741
4	1	6.708	0.988
5	1	7.000	1.235
6	1	1.760	1.235
7	1	7.000	1.482
8	1	3.312	1.482
9	1	7.000	1.729
10	1	4.863	1.729
11	1	7.000	1.976
12	1	6.415	1.976
13-14	2	7.000	2.223
15	1	1.467	2.223
16-17	2	7.000	2.470
18	1	3.019	2.470



You can also subsequently create bar numbers or modify your display using the count view individual modification:

em | Bent | Area data | Add area | Laying field link | Label type | Label position | Dimension texts | Leg numbers | **Bar numbers**

Where bars are summarized into groups, you can now determine using the option **Bar numbers in group** that the from-to numbers are displayed in a table before positioning the BR table.

P=0.35 (3) H=3.15 A=0.0 Part= 1 dl= 0.0  Bar numbers in group Distribution P=0.25 (2) Border P=0.35 (3)

10	1	4.863	1.729
11	1	7.000	1.976
12	1	6.415	1.976
13-14	2	7.000	2.223
15	1	1.467	2.223
16-17	2	7.000	2.470
18	1	3.019	2.470

**Bending Shape Dimension for Rnd and 1:1 using “Modify individually free”**

For rebar, the option **Bending shape dimension for Rnd/1:1** is now displayed in a “normal” display form in the additional function toolbar using “Modify individually free” for a rebar-bar representation. By activating this option, you can display rounded bars and the 1:1 display of a bending shape with mandrel dimensioning.

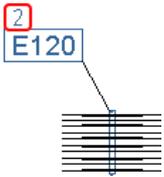
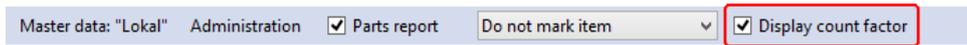
Modify rebar individually:  Bending shape dimension for Rnd/1:1

# Embedded Parts

## Embedded Parts

### Display Count Factor

You can now have the count factor displayed for embedded parts as an option. To do this, activate the toggling function **Display count factor** using the additional function toolbar.



In a similar way to the export of the count factor in reinforcement, you can also export the count factor as an option while printing a section.

### Separately Position Assembly Schedule

You can now position the assembly schedule for assembly parts separately on a drawing. The settings, for example, pen weight, match the embedded part schedule settings.

Pos.	Bezeichnung	Stck
E1	Transportanker Pfeifer Rd24 lang, o.glov.	1

Montageliste		
Pos.	Bezeichnung	Stck
E2	Kugelkopfanke LST 15,0to	2
E14	Blitzschutz FVZ	3
E120	K60-CV35-v8-H182-F120	2

If a schedule with an integrated assembly schedule has been previously positioned, store the assembly schedule separately and update the schedules. The integrated assembly schedule is removed by this.

# Unitization

## Unitization

The following new features exist in the unitization

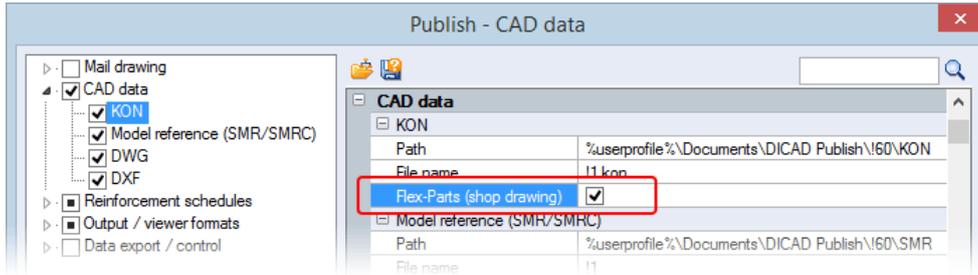
- The embedded part variable **ANSICHTB=5** now also applies for walls.
- The joint reinforcement now takes the sandwich wall insulation into consideration.
- Bar and mesh representations for the joint reinforcement are no longer created. Joint reinforcement is listed in its own reinforcement schedule (see menu **Settings > Drawing schedule templates > Unitization > Joint reinforcement/Joint reinforcement meshes**).
- Lattice girders are laid in the precast ceiling slabs with a varying concrete cover as an option. For this, choose differing concrete covers in the lattice girder settings (top/bottom) and activate the option **alternating**.
- A separate master data path is now available for the crane settings file (\*.kra) (see menu **Settings > Master data > Unitization > Cranes**).

# Exporting and Interfaces

## Publish/Mail Drawing

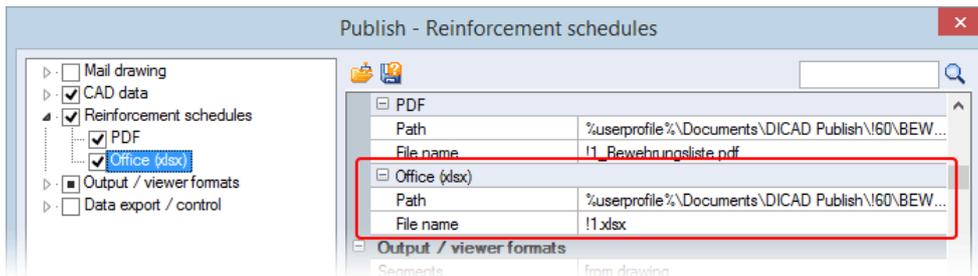
### CAD Data: Copy KON File with Flex-Part

Activate the option **Flex-Parts (shop drawing)** if a Flex-Part which exists in a shop drawing is intended to be copied into the sub-directory **standard-flex-parts** of the set path. A requirement for this is that the shop drawing and the Flex-Part both have the same name.



### Export Reinforcement Schedule to Office (xlsx)

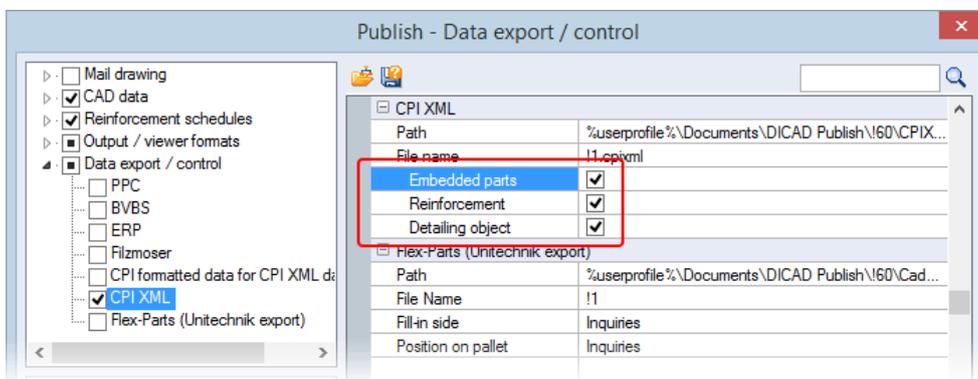
You can now also create an **XLSX** file as an export file from reinforcement schedules using the Publishing function.



## Data Export/Control

### CPI XML

In order to reduce the size of the export file during the data export to CPI XML, you can now specify that the embedded part geometry data, 3D reinforcement, Cube reinforcement and itemized objects are not transferred.



### Flex-Part (Unitechnik export)

Define the parameters for the fill-in side and the position on the pallet:

#### Fill-in side

Prompt, specification in **Cube** or determination of the fill-in side (top, bottom, etc.)

#### Position on pallet

Prompt of the position or determination of 0°, 90° or -90°

## Import/Export

### Export IFC

The material color is now also transferred into the IFC file during an export.

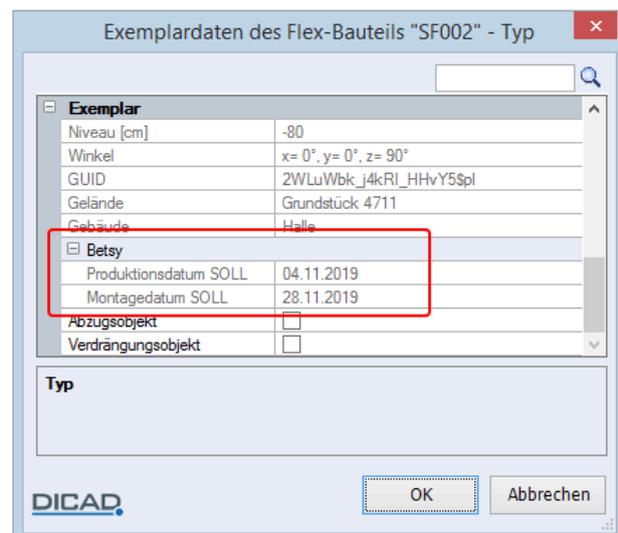
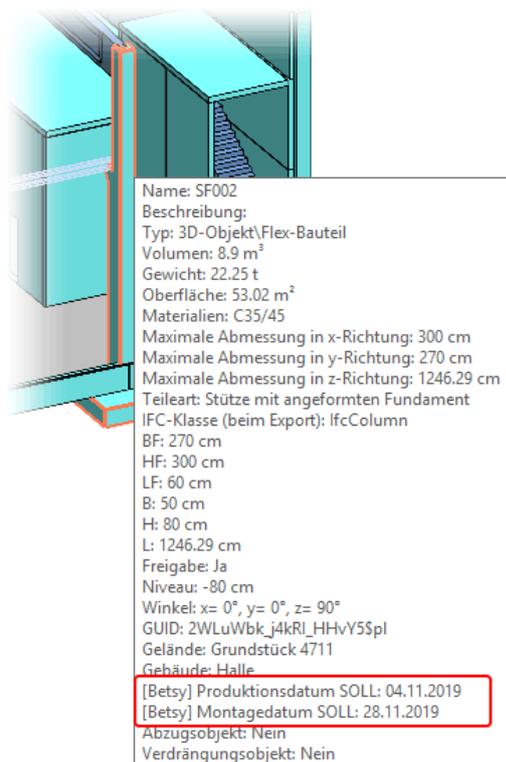
## Infor Interface

In the data export to Infor the data are now exported as follows:

- Each lattice girder, also from-to lattice girders, is now exported with its individual length.
- From-to rebar is now exported with its individual length.
- Article numbers are now also exported.

## Data Exchange Between CAD and ERP Systems (Betsy, ...)

You can now also load calculation data from ERP/PPC systems (e.g. Betsy) to STRAKON. If Flex-Part properties are changed/added in these systems, the new sample data are added to the appropriate Flex-Part during loading. All changes/new features are entered in the project from Betsy into the file **Betsy.cpixml**.



You can also access these data for a data-related visualization in a model:

