

## General

### Version 19.0

Build	Module	Description	ID
24.11.19	User interface	Even if only one span existed this could be removed, which sometimes caused a program termination.	13788
01.08.19	User interface	The call up of BEWE was not possible anymore after the calculation.	13579
20.05.19	User interface	The option for an increased snow load has been removed from the dialog "Calculation options" and was transferred to the property window.	13242
20.05.19	User interface	The tab "Input" was divided into "Project" and "System" in the ribbon bar.	13243
20.05.19	Calculation	<p><b>Elastic bedding with the loss of bedding</b></p> <p>The elastic bedding can fail for bedded beams, if there is a tension stress. A combination generation is necessary for the required non-linear calculation, which is automatically generated and can be modified selectively.</p> <p>In detail, this upgrading contains the following features:</p> <ul style="list-style-type: none"> <li>optionally elastic bedding with OR without loss of bedding</li> <li>automatic combination generation for the geotechnical analyses in the transient situation (<i>BS-T/GEO-2</i>)</li> <li>automatic combination generation both for the geotechnical analyses (<i>BS-P/GEO-2</i>) and for the structural member design of the final system in the permanent situation (<i>ULS</i>)</li> <li>automatic combination generation for a selected combination of actions, that is used for the deformation analysis (<i>SLS</i>)</li> <li>user-defined combinations or changes of automatically generated combinations are possible at any time</li> </ul> <p>The combinations can be selected specifically for the subsequent calculation.</p>	13079
20.05.19	General	Saving to a different directory than the project directory is now possible when archiving a position.	13007
20.05.19	Design	A further load case attribute "Additional load" is being offered.	13078

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Build	Module	Description	ID
29.11.18	Design	Recesses whose distance was entered with reference to the center were displayed correctly, but wrongfully calculated with the distance to the bottom edge of the recess.	13139
19.10.18	User interface	The corresponding table is now activated when clicking onto an entry in the object tree.	13059
31.07.18	Design	For different reinforcing steel qualities in the shear joint and shear design, the proportions of the existing web stirrup were calculated from the shear force design and additions for the shear joint design. For the unlikely case that there is no slab in the shear joint, the shear joint additions are being calculated as stirrups with a different steel quality. From this, a wrong utilization of the design was calculated as quotient of the varying steel strengths.	12660
25.04.18	General	Texts for the task and the position were cut-off after 21 characters.	9755
25.04.18	General	An existing position name is now suggested as file name when using "Save as".	11990
25.04.18	Output document	Line loads, which are actually next to each other, were drawn above each other in the graphic of the load cases.	9930
25.04.18	User interface	The current objects of the clipboard are now listed in the context menu functions, which serve the clipboard functions "cut / copy / paste".	11663
25.04.18	User interface	Recesses were missing in the 3D view.	11923
25.04.18	User interface	Modifications in the color settings can now also be saved as default.	11981
25.04.18	User interface	The project file and the corresponding *.res folder can be archived as *.zip file via the new function "Archive project" in the ribbon menu (Area A).	11996
25.04.18	User interface	The pre-installed examples can now be opened directly via the new function "Open examples" in the ribbon menu (Area A).	11999
25.04.18	User interface	The display of some components in the graphical user-interface has been adjusted, in order to consider the specified scaling in the display settings of the operating system.	12364
25.04.18	Input	The z-position of a recess can now alternatively be specified as distance between the BE girder and the center of the recess.	11254
25.04.18	Output document	The texts were not visible in the graphic of the load cases for line loads with very little values and thus a resulting thin drawing.	9724
25.04.18	Output document	Multiple single loads at the same x-position were drawn on top of each other, so that it was not possible to distinguish them in the graphic of the load cases.	11163
25.04.18	User interface	There was always only one layer of the strands visible in the view.	9666
25.04.18	User interface	Was "no design" selected, then the analysis overview still appeared at the end of the calculation although the window was empty.	9754
25.04.18	User interface	Not only the content of the cell, but also the corresponding objects were deleted when deleting a selected cell.	11979

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Build	Module	Description	ID
17.01.18	Calculation	Was only a torsional bedding existent as bedding, then the system graph in the output list was faulty which caused RTreport to issue an error message.	11901
17.01.18	Calculation	A single load at the right girder end has been ignored for a span-by-span distribution of the loading.	12168
10.04.17	Output document	The readableness of the indices in the dimension lines of the cross-section has been improved. Additionally, the indices in the system graph have been enlarged. (An installation of the updated base package is required for this.)	11258
08.03.17	Design	Accidental loads were sometimes considered multiple times depending on the involved live load categories in the stress resultants of the accidental combination.	11084
21.02.17	General	There were modifications made in the base package (e.g. in RTreport), which influence this program. For this, please read the release notes of RTbase.	10949
21.02.17	User interface	The maximum dimensions of the cross-sections as well as the static cross-section values are displayed in the property window for all types of materials.	10243
21.02.17	User interface	The unit for phi.y and phi.z was missing in the table for moment joints.	10748
21.02.17	Load transfer	The behavior when copying n single loads with the spacing dx in the table "Loading" and in the transfer of loads n-times with the spacing dx during the load transfer has been unified.	10239
21.02.17	User interface	Only a trilateral or quadrilateral flame application is possible as fire loading from now on.	10174
21.02.17	User interface	An eccentricity does not make sense for single moments, which is why the associated field for the input has been deactivated. Line moments in x-direction are now also possible.	10236
21.02.17	User interface	Now, a coordinate system is also displayed in the system graph. It already existed in the 3D view, however, it was placed incorrect.	10880
21.02.17	Input	The selection of a tendon can now also be made in the table "Prestressing".	9665

# Reinforced concrete

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Build	Module	Description	ID
24.11.19	Design	The <b>tabular fire protection analysis</b> has been revised fundamentally: <ul style="list-style-type: none"> <li>the mean axis distance of the reinforcement to the next fire-stressed side, recess / notch is hereby being considered</li> <li>lateral axis distance of the corner reinforcement with 1 layer</li> <li>effective beam height for quadrilateral flame application, respectively, trilateral flame application with a recess</li> </ul>	13725
01.08.19	Output document	Output of further creep and shrinkage coefficients for not prestressed girders.	12014
01.08.19	Output document	The "decisive stress" was issued as "maximum utilization" in the decompression analysis. Stress values will now only be issued at prestressed analysis sections outside of the application area.	13542
01.08.19	Output document	The longitudinal torsion reinforcement was not correctly displayed at cross-section offsets.	13546
01.08.19	Output document	The design combination for the crack width limitation was only issued for prestressed girders.	13567
01.08.19	Design	A height offset at the top edge of the girder was not correctly considered in the notch design.	13551
01.08.19	Design	<b>Tabular fire protection</b> Wide beams $b > 100$ cm with $b/h > 4$ are now handled as slabs.	13554
01.08.19	Design	<b>Tabular fire protection</b> For sections without a recess or notch and with a trilateral flame application, a required web height was accidentally calculated analogous to a quadrilateral flame application.	13570
01.08.19	Design	The notch was not considered in the analysis against <b>fatigue</b> (shear force).	13674
20.05.19	Design	<b>Fire protection</b> The utilization of the minimum cross-section area is displayed for a quadrilateral flame application, if it is $> 1$ .	12658
20.05.19	Design	<b>Watertight concrete</b> The changes from the new watertight concrete guideline from December 2017 have been implemented.	13346
20.05.19	User interface	Either the bearable stress range or the number of possible load cycles can now be specified for the <b>fatigue analysis</b> .	9446
20.05.19	User interface	<b>Fatigue</b> The bearable stress range of the prestressing steel is informatively listed in the property grid. It can be modified in the prestressing steel parameters of the selected prestressing method.	9447
20.05.19	User interface	Flange widths with the value 0.0 are now also possible for the sub-type 'General, symmetric, T-beam' of cross-sections with the type "I-beam".	13038
20.05.19	User interface	The <b>decompression analysis</b> is automatically ticked, if an exposure class differing from XC0/XC1 has been selected.	13158
20.05.19	Output document	Accidental loads were considered in the basic combination for the support forces and in the deflection analysis by mistake.	13412

Build	Module	Description	ID
20.05.19	Design	<p><b>Bending with longitudinal tension forces (<math>M_y + N_x, N_x &gt; 0</math>)</b></p> <p>It is distinguished between "mainly bending stress" and "mainly tensile stress" here. There are tensile forces in both cases - in the first case are the bending moments and in the second case the tensile normal forces the dominating stress resultants. Some adjustments have been made here, so that the reinforcement distribution is more favorable.</p> <p>The analysis of the bending bearing capacity for bending with normal force is always carried out with the action combinations</p> <ul style="list-style-type: none"> <li>• leading max/min <math>M_y</math> + associated <math>N_x</math></li> <li>• leading max/min <math>N_x</math> + associated <math>M_y</math></li> </ul> <p>From this, the maximum reinforcement cross-section areas at the top and bottom are issued. For a prestressing steel girder the calculation is carried out per point in time for <math>t=7, t=28, t=36500</math> days. For a reinforced concrete girder the point in time do not matter, since the stress resultants are equal. But it is calculated formal for 2 points in time, which is also connected with the deformations and creep + shrinkage.</p>	12769
20.05.19	Design	<p><b>Shear design</b></p> <p>Due to the bending stress with tensile normal forces, too small inner lever arms were determined for cross-section offsets in the area of a notch, which caused reinforcement peaks in the shear design.</p>	12771
20.05.19	Design	<p>For the <b>limitation of the crack widths in the area of a notch</b> the compression zone height (uncracked) has been adjusted to the residual web height.</p>	12772
20.05.19	Design	<p>Tolerance problems in the analysis of the <b>fire protection</b> in the area of a notch have been resolved.</p>	12773
20.05.19	Design	<p><b>Bending bearing capacity for <math>M + N</math></b></p> <p>For a structural member in tension in could happen, that the beam was subjected to both "mainly bending" and "mainly tension" (<math>e=M/N \ll 1</math>) during a design calculation run. This sometimes resulted in extreme peaks in the required reinforcement.</p>	12992
20.05.19	User interface	<p>With "Calculation with reinforcement selection", no calculated utilization levels for deflection and fire protection were displayed in the analysis overview.</p>	12865

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Build	Module	Description	ID
28.03.19	Design	The minimum width of the remaining residual cross-section is applied for the calculation of the concrete compressive stresses of notches.	13409
28.03.19	Output document	With "Refurbishment", a too high utilization level of 1,00 was sometimes issued due a tolerance problem.	13408
28.03.19	Design	No compressive stress and consequently no utilization level was determined for a calculational too small strut width (1 mm) in the notch design.	13289
29.11.18	Output document	In the section "Bending design - Bearing capacity" the unnecessary information of a utilization is omitted.	13056
29.11.18	Output document	A utilization > 1,0 in the design for shear force and torsion according to CSN EN eq. 6.29 was not issued in the result list.	13058
29.11.18	Design	The admissible compressive stress in a node of the strut and tie model (notch) has been adjusted to the national coefficients. The coefficients according to DIN EN hereby remain unchanged.	13082
19.10.18	Output document	The cross-section height in the area of the notch is issued correctly again in the result protocol of the bending reinforcement.	12770
19.10.18	Design	The utilization of the shear reinforcement was determined too high with an existing shear joint.	12746
19.10.18	Design	The determination, respectively, consideration of the effective increase in stiffness from the shrinkage proportion in the deflection calculation according to Krüger-Mertzsch has been removed again. Thus, the determined deflection in the cracked state correspond with the results in Version 17.0 again.	12816
19.10.18	Design	The equation 6.31 of the DIN EN 1992 is being considered for the torsion design again.	12871
19.10.18	Design	On special request, a factor for the shear force in the compression chord smaller than in the tension chord can be specified for the recess design.	12885
19.10.18	Calculation	In the design of the accidental situation sometimes too high partial safety factors for the material were used in the calculation for notches and recesses.	12870
19.10.18	Calculation	The singularity problem in the calculation of the <b>deflection in the cracked state (condition II)</b> has been fixed.	13088
25.04.18	Output document	The graph of the crack width has been added in the short list.	12457
25.04.18	Design	The shear design in the area of the support has been corrected due to a too small inner lever arm.	12492
25.04.18	User interface	The default value (c.vL) for the offset dimension of the longitudinal reinforcement is now 3,5 cm.	12166
25.04.18	Input	New loads can now also be added in the tree view.	11386
25.04.18	Input	There is now the possibility in the tree view to mask out the action(s) in a load case via the function "show only load cases".	11387
25.04.18	Output document	The labelings of cross-sections at notches covered each other here and there.	11182
25.04.18	Output document	In rare cases the reinforcement distribution was not labeled entirely.	11651
25.04.18	Output document	If a decompression analysis is selected, which is not necessary due to the exposure class, a hint that no analysis has been carried out is issued.	11760
25.04.18	Output document	An error message is issued, if the reduced web width for a shear force design approaches zero, e.g. due to the reduction of the duct.	11761
25.04.18	Output document	The position of the neutral axis and thus the x-axis of the T-sections was displayed at the wrong position.	11975
25.04.18	Design	<b>Initial cracking in the notch area</b> The wrong cross-section height was assumed in the analysis according to CSN EN.	11649

Build	Module	Description	ID
25.04.18	Design	<b>Fire protection</b> The reinforcement dimensions between axes were logged wrongly for systems with notches.	12437
25.04.18	Design	Notches were not considered in the automatic calculation of the characteristic torsion values.	12458
25.04.18	Design	<b>Fire protection</b> Notches with a small height were not recognized for slabs.	12477
25.04.18	Design	The specified (modified) prestressing steel material has not been correctly transferred to the result list and was only applied correctly in the 2nd calculation run.	12493
25.04.18	User interface	The selected prestressing method with the strand type and diameter was not completely legible in the tab "Prestressing".	9587
25.04.18	User interface	Single loads in x-direction were displayed in the wrong position, since the input of eZ relates to the neutral axis of the beam.	11183
25.04.18	User interface	The setting for the "effective slab width" is now also in the property window and no longer in the dialog "Calculation options".	11250
25.04.18	Calculation	After the input of a support settlement a single load of 20kN has been formally generated and displayed.	12048
25.04.18	User interface	The dynamic increase factor according to DIN EN 1991-1-1 (6.3) can be specified for the fatigue analysis. The default value is 1,40.	12341
25.04.18	Analyses	In order to calculate the <b>deflections in the cracked state</b> effective stiffnesses are being determined, which result from the moment effects and the curvatures due to creep and shrinkage. The proportion from shrinkage has been corrected.	12509

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Build	Module	Description	ID
21.03.18	Output document	The stated double shear stirrups of the web are the maximum value of the structurally required shear force reinforcement + double vertical torsion reinforcement and the minimum stirrup reinforcement. A comparison with the web stirrup proportion from the shear joint design was missing in the part of the structurally required shear force reinforcement.	12420
17.01.18	Output document	The value $f_{cd}$ was issued incorrect in the table of the material, if $\alpha_{cc}$ differed from the standard.	11952
17.01.18	Output document	The <b>robustness reinforcement</b> was not correctly distributed on the flanges.	11955
17.01.18	Design	<b>Fire protection</b> Rectangular cross-sections with $b = 1,00$ m are considered as slabs.	12008
17.01.18	Calculation	The settlement value was applied twice for load cases with the attribute "Support settlement, possible".	12047
29.08.17	Output document	ZEICON opened the generated ZAC in an empty MSB for an <i>individual layout of the stirrups</i> in the reinforcement drawing. This problem did not occur with RTviewer.	11203
29.08.17	Output document	<b>Reinforcement from the bending bearing capacity in the bottom flange</b> The reinforcement in flange was not saved, if the axis distance $d_1$ was greater than the flange width.	11686
29.08.17	Output document	In the recess design with varying reinforcement distances of recess and girder, the $d_1$ of the recess was applied for the girder.	11689
29.08.17	Design	<b>Fire protection analysis</b> The required reinforcement can be provided with a factor in the fire protection analysis. With this the critical temperature $T_{crit}$ is increased, which has been ignored for very small $M_{Ed,fi} < 1$ kNm however.	11274
29.08.17	Design	<b>Limitation of the crack widths according to CSN</b> Unreasonable crack spacings $s_{rmax}$ result for very low reinforcement ratios in the flanges of T-beams for EN 1992-1-1. This is now trapped, as it is already in the area of the web.	11388
29.08.17	Design	The wall thickness of the equivalent hollow girder for the torsion design ( $A_{web}/u_{web}$ ) may not be smaller than $2 \cdot d_1$ , according to DIN only $2 \cdot d_1$ . From now on, the smaller value from $d_{1u}$ , $d_{1o}$ and additionally $cvL + \min(ds)/2$ is applied for $d_1$ . For very small and high webs no usable $A_k$ for the design resulted.	11687
29.08.17	Design	For a shear force reduction due to single loads close to a support, the utilization of the shear design was calculated with the unreduced $VE_d$ .	11688
29.08.17	Design	<b>structural fire protection</b> The minimum web height for a trilateral flame application was calculated as for a quadrilateral flame application.	11718
02.05.17	Design	<b>Ductility reinforcement in the notch area</b> The static height to be applied was incorrect in the area of a notch.	11269
02.05.17	Design	<b>Concrete compressive stresses in prestressed components</b> In the analysis of the concrete compressive stresses of prestressed components, the variance coefficient has been corrected corresponding to the new EN standards.	11290
10.04.17	Output document	<b>Reinforcing steel masses</b> <ul style="list-style-type: none"> <li>if a reinforcement has been selected with BEWE, then the <b>reinforcing steel masses of the selected reinforcement</b> are issued in the result list</li> <li>if no reinforcement has been selected, then the <b>reinforcing steel amounts of the required reinforcement</b> are issued in the result list</li> </ul>	11011
10.04.17	General	The possibility to select a quadrilateral flame application has been removed.	11193
10.04.17	Output document	<b>Fire protection analysis of slabs</b> The wrong table was used for the axis distance of the reinforcement, if the slab width was not exactly 1,00 m.	11181

Build	Module	Description	ID
10.04.17	Design	<b>Notches in slabs</b> In order to be considered, notches in slabs must have a minimum height of 2 cm now.	11184
10.04.17	Design	<b>Stress-strain curve for reinforcing steel</b> The steel strain has been limited to 10 ‰ for the limit states of serviceability and fatigue, i.e. the stress-strain curve for reinforcing steel maximally ranges from -10 to +10 ‰.	11208
10.04.17	User interface	Was the first span deleted in a system with a general cross-section run, then this sometimes caused a program termination.	11119
21.02.17	General	The prestressing method database has been extended with the prestressing method for single strands without bond by DSI.	10843
21.02.17	Output document	The effective slab width is issued as diagram and additionally as table in the detailed list.	9928
21.02.17	Output document	The value $h_{w,min}$ in the legend of the tabular fire protection has been replaced with "Beam height", since the minimum height is also used for cross-sections without a web.	10173
21.02.17	Output document	The tendon geometry is now being pictured. Furthermore, the prestressing force diagrams do also contain the distribution from the individual prestressing steps.	10350
21.02.17	Output document	Instead of the design stress resultants does the stress resultant output now contain the combination stress resultants without modifications for the design such as rounding offs, minimum moments or section moments. The moments applied in the design are still issued in the tables of the calculated reinforcement.	10591
21.02.17	Design	<b>Tensile force and shear force coverage</b> A calculation with a subsequent selection of the reinforcement can now be carried out. This means a reinforcement is selected in a way, that the required longitudinal reinforcement including the offset dimension (tensile force coverage) and the required shear reinforcement (shear force coverage) are covered. The <u>selected reinforcement</u> is depicted in the graphs of the longitudinal reinforcement and shear reinforcement and is issued in the result list with a table. The material requirements are adjusted depending on the selected reinforcement.	11037
21.02.17	Design	<b>Reinforcement drawing</b> For continuous beams with a constant cross-section run, a reinforcement drawing can be exported to RTviewer. There it can be displayed including offset dimension and anchorage length. Is ZEICON installed, then this program is opened instead of RTviewer.	11038
21.02.17	User interface	The normative value for the admissible crack width can now automatically be determined by the program, for what "Crack width automatically" has to be ticked in the property window. Is this checkbox not ticked, then the crack width can still be specified.	9835
21.02.17	User interface	The input of the coefficients for the fatigue analysis has been extended with the number of load cycles.	9940
21.02.17	Calculation	The moment redistribution has been enhanced with a more differentiated examination of the original load cases, in order to comprise the dependency of the superpositioned span moments from the support moments to be reduced. With this, sometimes more favorable action effects result on the bottom side of the beam.	10982
21.02.17	Output document	The cross-section values $A_c$ and $I_y$ were not issued for a slab cross-section.	10612
21.02.17	Output document	The hint was missing, that lateral loads in y-direction are only considered in the torsion design.	10769
21.02.17	Design	<b>Tabular fire protection</b> A minimum web height has to be proven for recesses and notches. $h_{min}$ was possibly calculated too unfavorable, which is why the interpolation of the tabular values has been revised.	10205
21.02.17	Design	<b>Deformations in the cracked state</b> The shrinkage proportion was not considered sometimes, if only the bending and shear strength as well as the deformations in the cracked state were to be proven and no reinforcement has been specified. The shrinkage proportion was always considered correctly in all other cases.	10399
21.02.17	Design	The setting "No minimum shear force reinforcement" was not being considered.	10925

# Release Notes

## BALKEN



Build	Module	Description	ID
21.02.17	User interface	The possibility to enter an eccentricity is now enabled / disabled in accordance with the selected load direction.	9881
21.02.17	User interface	Now a rectangular cross-section with the slab characteristics is offered for the type <i>Uniaxial element slab</i> under <i>Edit cross-section</i> in the quick input.	10113
21.02.17	Input	The selection of "Type 1" as system type was not saved, whereby it could not be set directly.	10549

## Structural steel

### Version 19.0

Build	Module	Description	ID
20.05.19	Analyses	The design according to the <b>elastic-plastic method</b> is now possible for <u>all section types</u> .	13080

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Build	Module	Description	ID
25.04.18	Design	Solely horizontal supports are also considered for the calculation of the span lengths in the lateral torsional buckling analysis.	11895
25.04.18	User interface	The graphic in the view was misleading for line loads in x- and y-direction. Now, the loads are additionally labeled with $p_x / p_y$ and the arrow in the z-direction has been removed.	9840
25.04.18	User interface	For structural steel a wrong help text was displayed in the property window.	10348

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Build	Module	Description	ID
10.04.17	Analyses	For the lateral torsional buckling analysis according to EN 1993-1-1 (and national annexes) it has to be user-defined, whether the calculation of the interaction coefficients $k_{ij}$ of the girders has to be classified as torsionally rigid (table B.1) or as torsionally flexible (table B.2) structural member. For torsionally rigid structural members the simplification, that for I-beams and hollow cross-sections, which are loaded in compression and uniaxial bending, the coefficient $k_{zy} = 0$ may be assumed is still used.	11200
21.02.17	General	Program maintenance and support	11033
21.02.17	Output document	Revision of the short list.	10510
21.02.17	User interface	The name of a load case could not be modified, because this column was missing in the tab "Load cases".	9622

## Timber

### Version 19.0

Build	Module	Description	ID
24.11.19	Calculation	Accidental loads were not taken into account in the bearing capacity analysis.	13962
20.05.19	Design	The material "Träger <b>BauBuche GL75</b> " replaces the hitherto material "Träger BauBuche GL70" according to ETA-14/0354 of 11.07.2018.	13018

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Build	Module	Description	ID
25.04.18	General	Program maintenance and support	12520

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Build	Module	Description	ID
21.02.17	General	Program maintenance and support	11034
21.02.17	Output document	Revision of the short list.	10312
21.02.17	User interface	The cross-sections can now be specified differently for each span.	9966
21.02.17	User interface	The name of a load case could not be modified, because this column was missing in the tab "Load cases".	10947