

## General

### Version 18.0

Build	Module	Description	ID
24.07.18	User interface	Automatically transferred design combinations were no longer sorted after a restart of the project.	12805
11.06.18	User interface	When user-defined and automatically generated load case combinations exist these were not numbered consecutively.	12666
20.04.18	General	An existing position name is now suggested as file name when using "Save as".	11991
20.04.18	Output document	If horizontal forces are acting in the origin, the axes of coordinates was not identifiable in the graph of the load cases.	11727
20.04.18	Output document	The dimension lines for the cross-section and the reinforcement ratio were hardly readable in the system graph.	11726
20.04.18	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.	12365
20.04.18	User interface	The pre-installed examples can now be opened directly via the new function "Open examples" in the ribbon menu (Area A).	12000
20.04.18	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).	11930
20.04.18	User interface	The current objects of the clipboard are now listed in the context menu functions, which serve the clipboard functions "cut / copy / paste".	11664
20.04.18	General	Texts for the task and the position were cut-off after 21 characters.	9878
20.04.18	User interface	Modifications in the color settings can now also be saved as default.	9421
20.04.18	User interface	When importing a single-storey column supported at the top and the bottom from a *.bev file, the supports at the column head were not displayed in 3D view although the supports existed.	11657
20.04.18	User interface	Wrong coefficients were used for the automatic earthquake combinations.	8154
20.04.18	User interface	Not only the content of the cell, but also the corresponding objects were deleted when deleting a selected cell.	8107
20.04.18	Input	The program often terminated when entering the project information.	11447

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Build	Module	Description	ID
22.09.17	User interface	The program terminated when switching from the zone design to the tabular fire protection, if the property window was not attached.	11757
22.09.17	Load transfer	The load factor was not considered.	11847
19.07.17	Input	When entering values into the table of the loads the focus skipped to the property window repeatedly, which sometimes lead to unwanted modifications.	11448
10.04.17	Output document	The readability of the indices in the dimension lines of the cross-section has been improved. (An installation of the updated base package is required for this.)	11257
10.04.17	User interface	Do multiple load cases with the same live load attribute exist, then these are considered all together as a group in the automatic combination generation. Now, individual load cases can be excluded from this grouping via the context menu in the tree view, so that those can act individually or in combination with the others.	11217
13.02.17	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.	10948
13.02.17	General	Was a different project to be opened while working on a project, then there was no dialog whether the modifications at the current project should be saved.	9497
13.02.17	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.	10244
13.02.17	User interface	The entry <i>Supports</i> in the object tree has been extended to <i>Supports and pre-deformation</i> in order to find the definition of the pre-deformations more easily.	10115
13.02.17	User interface	The support in x-direction was being displayed, although none had been defined.	9625

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Build	Module	Description	ID
13.12.16	Load transfer	Since the beginning of August 2016, the sign of the moments and horizontal forces for system angles of 90 and 270 degree was transformed incorrectly for the load transfer between BALKEN and BALKEN, respectively, BALKEN and BEST.	10678
24.11.16	General	On computers with high-resolution screens (4K resolution) and preset scaling of the fonts the program could not be started.	10577
11.07.16	Load transfer	A load transfer file (*.lrf), in which the calculation results of the support forces and support moments are saved for each load case, is generated and stored in the *.res folder for each calculation of a BALKEN file. These results can now be imported into BEST.	9898
11.07.16	User interface	The eccentricity of the single loads in y-direction was displayed in the opposite direction in the 3D view.	9597
11.07.16	User interface	Single loads in positive y-direction were displayed in the negative y-direction in the 3D view.	9409
11.07.16	Calculation	When entering a line load, which is longer than the column, it is now automatically trimmed to the length of the column.	9246
10.03.16	Output document	The graph for the shear force $V_y$ was not displayed in the stress resultant graphs of the result list, if already 4 result graphs existed in the same line.	9588
10.03.16	User interface	The coefficients of variable loads are pre-allocated with 1,50 for the <i>safety against displacement (permanent)</i> and with 1,00 for the <i>safety against displacement (accidental)</i> and <i>earthquake</i> when generating design combinations.	9700
10.03.16	User interface	Circular and annulus cross-sections are now dimensioned correctly in the graphical user-interface.	9172

Build	Module	Description	ID
10.03.16	Calculation	The cross-section description is now transferred correctly to the calculating core for columns with <i>H-sections</i> and <i>circular cross-sections</i> .	9703
15.01.16	General	Program modifications for the <b>compatibility with Windows 10</b> .	9518
15.01.16	General	Generating a reinforcement drawing by exporting the ZAC macro to the CAD program is now carried out with RTviewer by default. The program ZACview is hereby replaced. With an existing installation of ZEICON (from version 15) this CAD system is started automatically.	6839
15.01.16	User interface	The default layout of the individual windows in the graphical user interface has been optimized. Furthermore, the user-defined layout of the windows remains after the installation of program updates.	7938
15.01.16	Design	When generating a new design combination, the factors were not automatically updated when adding a load case.	9317
15.01.16	User interface	Modifying the leading and accompanying action via the button <i>user-defined...</i> in the tab "Design combinations" malfunctioned.	9357
15.01.16	User interface	The names of the entries in the project properties have been unified for BALKEN, BEST and FUNDA.	9282
15.01.16	User interface	The arrows in the view were pointing in the wrong direction (top for positive loads) for line loads in z-direction.	9024
15.01.16	Calculation	The support forces are now issued for all load case combinations. Hitherto, this was only done for the ones relevant in the design.	9361

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Build	Module	Description	ID
27.11.15	General	Single-story or multi-story columns in the ultimate limit state as well as in the limit state of serviceability and with the consideration of imperfections can be verified according to first and second order theory with the <u>new option „steel column“</u> .	9417
27.11.15	RTreport	The data of the result list for RTreport in the sub folder <i>projectname.besx.res</i> are now saved in the file <i>projectname.rtml</i> .	9265

## Reinforced concrete

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Build	Module	Description	ID
20.04.18	Output document	The dimensioning of the H-section was upside-down in the system graph.	10317
20.04.18	Calculation	A minimum stirrup reinforcement has been calculated for biaxial bending according to the inclination of the resultant from a skew width. From now on, the calculation is carried out for each axis with the corresponding cross-section widths. The shear force design is still carried out for biaxial bending.	12490
20.04.18	Calculation	Line loads with the length = 0 are no longer considered, since there were errors in the calculation.	12089
20.04.18	Input	There is now a separate entry for the edge axis distance of the reinforcement for the temperature calculation of a multipart reinforcement (3x4 / 5x4).	11455

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Build	Module	Description	ID
25.10.17	User interface	The call-up of ZAC is possible again.	11853
19.07.17	Design	<b>Hot design</b> A distinct edge-axis-distance of the reinforcement can now be specified in the thermal analysis for the zone method and in the tabular fire protection analysis. Was no input made, the edge-axis-distance defined for the cross-section will still be used.	11296
13.02.17	General	The interface file *.bif for the foundation loads is, just like already for steel columns, stored only in the *.besx.res folder with the result files.	9913
13.02.17	Output document	The creep coefficient phi.t is also issued in the table of the load case combinations, even if the option <i>phi.t all equal</i> has been selected in the input.	10335
13.02.17	Output document	The ductility has been added in the table for the material coefficients of the reinforcing steel.	10165
13.02.17	Output document	The summary of the results is no longer issued, if there were errors in the calculation.	9621
13.02.17	Output document	The creep deformations are now also being issued.	9620
13.02.17	Design	The user-defined coefficient for the consideration of the long-term action effects onto the concrete compressive strength alpha_cc has not been resumed correctly.	9766
13.02.17	User interface	When changing the reinforcement type in the fire protection analysis from corner reinforcement to circumferential reinforcement the program sometimes terminated.	10832
13.02.17	User interface	The dialog "Foundation restraint" malfunctioned in the Czech version. With each click in a input field, the values in the dialog were divided in half.	9900
13.02.17	User interface	Before starting a calculation with a fire protection analysis it is checked, whether a design combination has been selected for this.	8876
13.02.17	User interface	The help texts for the entries about the output extent in the dialog "Calculation options" have been updated.	8094
13.02.17	Input	Reinforcement specifications no longer existed, if modifications were made in the tab "Loading" and then these were reverted by using UNDO.	10461

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Build	Module	Description	ID
15.02.17	Design	<b>Fire protection</b> The reduction of the cross-section area according to the zone method has been corrected for a bilateral flame application at wall type columns.	10971
13.12.16	Output document	The name of the reinforcement layout 4x4 has been replaced with "Cir" (circumferential reinforcement).	10632
24.11.16	Design	<b>Stress strain curves of high-strength concretes</b> The stress strain curve for the design in the curved area < Eps.c2 was not calculated correctly for high-strength concretes from about C80/95 on. The stress strain curve for the stiffness calculation was correct, however.	10548
11.07.16	Output document	The ratio of the effective to the elastic bending stiffnesses was not always issued.	9710
11.07.16	Output document	Accidental load case combinations (Impact) were labeled as fire combinations.	9612
11.07.16	Output document	In the summary of the required reinforcement, a smaller tolerance is being considered in the calculation of the necessary amount of reinforcement bars.	9580
11.04.16	Design	The adjustment of the actual side of the flame application is made from the type of flame application (unilateral up to quadrilateral) according to the definition of the hot design in the manual <i>BEST - Grundlagen</i> , chapter <i>Beflammung</i> .	9776
05.04.16	General	Blanks in the project path are considered correctly, when generating a reinforcement drawing by transferring the ZAC macro to the CAD editor.	9720
05.04.16	Input	<b>Automatically generated dead load</b> Depending on the design situation gam_sup was always used for the carrying capacity analysis for the automatically generated dead load (LC 0). Now the partial safety factor for the permanent loads of the current combination is used, i.e. smaller coefficients such as gam_inf are also being considered.	9668
10.03.16	Calculation	<b>Flame application</b> A mean temperature was calculated from the steel temperatures in the individual reinforcement bars depending on the type of flame application. For a unilateral flame application the temperature in the centroid of the temperature distribution is now being used. The weighted mean temperatures are now also assumed for a bilateral and trilateral flame application, so that generally higher temperatures are applied.	9212
15.01.16	Output document	A minimum reinforcement under the rules for beams is not calculated for columns. A structurally required reinforcement has to be verified with the construction guidelines for column stirrups.	9511
15.01.16	Output document	Asw was not issued in the summary although shear reinforcement is calculationaly required.	9510
15.01.16	Output document	For the tabular fire protection analysis with calculation of the possible fire duration, the fire resistance class or the fire duration can no longer be specified.	9224
15.01.16	Analyses	<b>Fire protection analysis</b> A fire protection analysis had been requested, but no load case combination has been generated (zone method) or a load case combinations has been selected (tabular analysis). In the abbreviated version of the analysis summary one could have the impression, as if the fire protection analysis was carried out, although no fire protection analysis can be carried out. The printout in the result list has been corrected.	9564

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Build	Module	Description	ID
19.01.16	Design	The inner lever arm for the shear design is calculated under consideration of the layout dimension of the longitudinal reinforcement. If no input has been made for this, cvl is set to 2 cm. Up to now, cvl = d1 had been assumed.	9591

## Structural steel

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Build	Module	Description	ID
20.04.18	User interface	A deformation analysis is only carried out, if a deformation combination exists. Is this not the case, then a warning is shown before the calculation.	11134

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Build	Module	Description	ID
19.07.17	Output document	The unit of the stresses has been corrected to N/mm <sup>2</sup> in the stress analyses of the ultimate limit state.	11444
19.07.17	Output document	In the stress analyses with stress resultants according to 2nd order theory the value $\gamma_{M1} = 1.1$ is used with DIN EN 1993-1-1 for the calculation of the utilization, since for non-linear column calculations it can be assumed, that a stability problem also exists in the analyses at the cross-section of the column. For columns in which the cross-section utilization is relevant in comparison to the utilization of the pure stability analysis, 10% higher utilization result from using $\gamma_{M1}$ .	11443
10.04.17	Calculation	Temporary files necessary for the calculation are now locally saved in the temporary directory.	11207
13.02.17	General	Program maintenance and support	11029

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Build	Module	Description	ID
11.07.16	General	When opening a file after the calculation of another, not all stress results were deleted.	9891
11.07.16	Output document	The results in the stress analysis according to 1st order theory are displayed in the result list, if they were selected for the output.	9880
11.07.16	Design	Were multiple single loads without eccentricity defined at the same position in various lines within one load case, then only the last single load was considered in the calculation.	9822
15.01.16	General	Program maintenance and support	9486

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Build	Module	Description	ID
27.11.15	General	<p>The new option features, amongst others, the following possibilities:</p> <ul style="list-style-type: none"> <li>Analyses according to DIN and EN with national annexes for DE, AT, SK/CZ and UK</li> <li>Calculation of the pre-deformation affine to the first eigenmode for each load combination</li> <li>Calculation according to first and second order theory with consideration of the imperfections</li> <li>Analyses EE (elastic-elastic) and EP (elastic-plastic) for biaxial bending with normal force</li> <li>Stability analysis for each load combination</li> <li>Deformation verification procedure in serviceability state</li> <li>Automatism for generating load combinations</li> <li>Welded and rolled sections for I-sections and rectangular as well as tubular sections</li> <li>Arbitrary gradating of column cross-sections with eccentricity</li> <li>Supports fixed or elastic with consideration of attached hinged columns</li> <li>Possibility of program configuration and language selection</li> <li>Simple and clear result evaluation for minimal, short, long and detailed list</li> <li>Graphical output of the stress resultants, stresses, utilizations, deformations and 1st eigenmode</li> </ul>	9418