Version 19.0

Build	Module	Description	ID
06.02.20	NAZWEI	**Construction state stresses** Hitherto, the concrete age in the 1st construction state of systems produced segment-by-segment and for sprue systems was assumed with "0" days. The concrete strength parameters were then calculated for 7 days. From now on, the concrete strength parameters are calculated for the specified period under consideration, i.e. there is a concrete age of 2 days for a period of consideration = 2 days and thus the concrete strengths fct05 and fcc are also determined for 2 days.	13748
15.08.19	General	The maximum utilization and the maximum resistance per span were issued in the summary of the results of the recalcualtion guideline (NRR), but not the resistance and design moment associated with the maximum utilization.	13679
15.08.19	HAUZU	The **variance coefficients for external prestressing** are now also considered according to DIN EN 1992-1 NCI 5.10.9.	13639
22.07.19	General	Adjustments to the current program version TRIMAS® 19.0.	13629
22.05.19	General	Adjustments to the current program version TRIMAS® 19.0.	13507
16.05.19	Evaluation	**Limitation of the concrete compressive stresses** A separate display of the concrete compressive stresses due to the rare and quasi-permanent combination of actions is now possible. The utilization of the concrete compressive stresses covers both analysis, i.e. the respective more unfavorable utilization is being displayed graphically. In the result list are all utilizations tabularly issued in longitudinal and lateral direction.	13342
16.05.19	Generation	**Haunched main girder layouts** For haunched beams it is no longer necessary to ensure, that no internal cross-sections are being generated: • the haunched layout is approximatively described by reference cross-sections, that are generated in the program module QUER • further internal cross-sections are automaticall ygenerated through the element allocation - e.g. the mean element length in the meshing of the deck slab • the therefore internally generated cross-sections are automatically calculated, so that all cross-section values are available for the design The concrete design is carried out consecutively for all cross-sections, independent whether the design cross-section is a reference cross-sections or an automatically generated cross-section. The shear force bearing capacity is then carried out under a possible modification of the design shear force, if there are variable cross-sections.	13341
16.05.19	NAZWEI	**Bending bearing capacity in prestressed beams** The bending design can be carried out uniaxial or biaxial (skew bending). The corresponding MEd,z to max/min MEd,y are being considered in the biaxial design. A complete design with skew bending (except limitation of the crack width) is in progress. The biaxial design with typified cross-section is completely possible (max/min MEd,y, max/min MEd,z, max/min NEd,x plus associated stress resultants) in reinforced concrete beams, however.	13340
16.05.19	NAZWEI	**Construction state stresses** The following construction state stresses can be determined under the consideration of the loading and stress history (creep and shrinkage): • Limitation of the concrete edge tensile stresses • Limitation of the concrete compressive stresses • Limitation of the prestressing steel stresses All analyses can be carried out uniaxial or *biaxial* (skew bending). Reduction factors for partial prestressing and partial activation of the dead load can be specified.	13339

Build	Module	Description	ID
16.05.19	NAZWEI	**Effective design cross-section** Under the condition, that the effective areas were defined in the system modeling (TRIMAS input) and the cross-section is a T-beam or I-beam (not a closed box section), the design in NAZWEI is carried out at the effective cross-section. This also means, that also only the reinforcement in the effective cross-section is being considered. The amount of partial areas and polygon points remains the same compared to the total cross-section.	13338
16.05.19	NAZWEI	The following **fatigue analyses** are carried out: • equivalent constant amplitude for longitudinal reinforcement and prestressing steel due to M + N interaction in level 2 • equivalent constant amplitude for **concrete pressure** for railway bridges due to M + N interaction in level 2 --> has been revised • concrete compression strut due to V+T interaction • equivalent constant amplitude of the tie due to V in level 2 (Lateral reinforcement, stirrups) • fatigue strength analysis for longitudinal reinforcement and prestressing steel acc. to the recalculation guideline in level 3 The existing number of load cycles can also be specified.	13337
16.05.19	Calculation	Are cross-sections for concrete bridges or steel composite bridges saved anew in the associated cross-section input, the FE data has to be regenerated and the input data must be saved before the FE calculation. If this has not been carried out, the FE calculation points this out with a corresponding message.	12957
16.05.19	QUER	The formula for the calculation of the torsion moment of inertia has been corrected in the property window.	13024

Version 18.0

Build	Module	Description	ID
25.07.19	General	Adjustments to the current program version TRIMAS® 18.0.	13660
13.05.19	General	Adjustments to the current program version TRIMAS® 18.0.	13482
18.04.19	General	Adjustments to the current program version TRIMAS® 18.0.	13453
27.11.18	General	Adjustments to the current program version TRIMAS® 18.0.	13138
04.10.18	General	Adjustments to the current program version TRIMAS® 18.0.	12988
09.08.18	General	Adjustments to the current program version TRIMAS® 18.0.	12861
12.06.18	HAUZU	The variance coefficient was incorrect in the combinations for the limitation of the crack widths for a **solely external prestressing**.	12686
12.06.18	HAUZU	**Prestressing steel stresses (condition I)** Wrong components were used in the combination generation to some extent for statically determinate systems.	12644
12.06.18	HAUZU	The combination generation of the quasi-permanent combination of actions for the limitation of the concrete compressive stresses was not correct with a **solely external prestressing**.	12632
07.05.18	Evaluation	The **utilizations of the flange connections** for struts and ties (lateral reinforcement) can now be evaluated separately.	12026
07.05.18	Evaluation	The **utilizations of the tie** due to shear force, torsion, shear force + torsion and the **torsional longitudinal reinforcement** can now be evaluated separately.	12024
07.05.18	Input	After a geometrical modification of a bridge cross-section in the graphic cross-section editor, the herefrom generated cross-sections are adjusted.	11431
07.05.18	Interface	The utilizations of the flange connections are now also issued in the summary of the results from the recalculation.	12027
07.05.18	NAZWEI	Utilizations of the main tensile stresses and main compressive stresses (ULS) are now issued in the evaluation (if the analysis has been carried out).	12021
07.05.18	NAZWEI	**Shear force and torsion bearing capacity** In special cases is - in addition to the already existing analyses - an analysis of the principal compressive stresses in the ultimate limit state necessary, which can now be carried out with the program. The principal compressive stresses are - depending on the value of the principal compressive stresses I - either carried out and limited in the uncracked state or according to the framework analogy in the cracked state. The utilization levels can be displayed as graph.	11936
07.05.18	Output document	The header of the diagram "Utilization - summary in lateral direction" has been replaced by "Utilization - summary shear force and torsion".	12020
07.05.18	QUER	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.	12369
07.05.18	Design	The reason for the error message in the design of **trough cross-sections** (L-sections) has been resolved.	12124
07.05.18	HAUZU	A **fatigue analysis** for reinforced concrete is now also carried out with **only external prestressing**.	12314
07.05.18	HAUZU	"+G2" is no longer displayed in the combination texts for the **construction state stresses** and in the **decompression analysis**, if no action "G2" (finishing loads) exists.	12187
07.05.18	HAUZU	**Prestressing steel stresses** In the load case combination names was "G1" removed, since the structure dead load has no effect on the prestressing steel.	12180
07.05.18	HAUZU	The proportion of the support settlement can be specified directly (see control STEU 'SLSO') for the decompression analysis, however, this proportion was not considered in every combination.	11953
07.05.18	NAZWEI	The **stresses in the construction state** are now also carried out, if multiple construction states have been entered in TRIMAS, but no real construction state system exists.	12351

Release Notes
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Version 17.0

Build	Module	Description	ID
01.02.18	NAZWEI	The **construction state stresses** have been corrected.	12317
17.11.17	General	Adjustments to the current program version TRIMAS® 17.0.	12128
19.10.17	Calculation	**rectangular cross-sections with multiple layers** I the terminated cracking the value rho,eff was not correctly calculated for rectangular cross-sections without flange connections, which consist of several partial areas.	11542
19.10.17	HAUZU	For a **2-stage prestressing in coupling joints**, the variance coefficient of the prestressing was not correctly applied in the calculation of the neutral axis stresses for the analysis of the initial cracking.	11713
19.10.17	HAUZU	In the analysis of the ultimate limit state of pedestrian bridges, the traffic load groups 1 and 2 are alternatively considered in a calculation. Only the uniformly distributed traffic loads (gr1) are applied in the SLS analyses.	11712
19.10.17	NAZWEI	The planned service life was overwritten by the stress analyses in the construction state. This had an influence, if the lambda4 value was automatically calculated.	11615
19.10.17	NAZWEI	**Laying dimension cvL** Did a BEWA line exist in the xan interface and the cvL parameter was not defined, then the concrete cover was incorrectly calculated.	11484
05.05.17	General	Adjustments to the current program version TRIMAS® 17.0.	11360
02.05.17	NAZWEI	**Limitation of the prestressing steel stresses** Since prestressing steel layers with varying materials are allowed, the admissible prestressing steel stresses in the SLS are calculated per layer. In the process, wrong utilizations of the prestressing steel stresses arose.	11252
02.05.17	NAZWEI	**Tension flange connection** The shear parts in the tension flange are omitted, if no reinforcement and no prestressing steel exist; i.e. the tension flange connection cannot be designed.	11220
02.05.17	Superposition	The labeling "M(t)" has been replaced with "M(x)" in version 17.0. The existing superposition load case "Balken/M(t)" has not been transferred, when opening input data from version 16.0 and older.	11330
14.03.17	Analyses	**Optimization of the strut angle against torsional action effects for bridge recalculations** The strut inclination for the shear force design and for the torsion design can be defined by the user. These settings are valid globally for all analysis sections of one calculation run. In order to enhance the optimization of the torsion design, 2 additional alternatives are offered: • the local strut inclinations for the shear and torsion design can be specified at each analysis section (ORTS-Zeile); these specifications are valid until the next modification, so that several areas can be handled differently at each analysis section (ORTS-Zeile) the strut inclination can be optimized based on the torsional bearing capacity with the objective of the utilization at the existing longitudinal torsion reinforcement preferably being = 1; the strut angle found this way is used for the torsion design, the shear force design is still carried out depending on the loading, i.e. the shear design is carried out according to the 2nd method with 2 variable strut angles	10469
14.03.17	Input	The selection of the load case attributes for dead load and prestressing has been assigned better and limited accordingly for different types of bridges: • *Reinforced concrete bridges and steel composite bridges* Dead load: *in-gate* and *construction state* Prestressing: *in-gate* and *construction state* • *Concrete composite bridges* Dead load: *precast member* and *in-situ concrete* Prestressing: *precast member* and *composite* • *Steel bridges* permanent load no prestressing	9971

Build	Module	Description	ID
14.03.17	NAZWEI	**Utilization levels in the recalculation of existing bridges according to the NRR** The utilization levels are now displayed in the graphs "Utilization level summary - longitudinal direction" (graph 1), "Utilization level summary - lateral direction" (graph 2) and "Announcement behavior - summary" (graph 3). New are the diagrams for "Fatigue - reinforcing steel" and "Fatigue - prestressing steel" in graph 1, the diagrams for "Longitudinal torsion reinforcement", "Flange connection reinforcement", "Flange connection of the strut" and "Web of the strut" in graph 2 as well as the diagram "Residual prestressing steel area for a req. residual safety of gamp=1.1" in graph 3. Furthermore, the table "Summary of the utilization levels" has been extended with the columns "Fatigue - reinforcing steel", "Fatigue - prestressing steel" and "Flange connection reinforcement".	9855
14.03.17	NAZWEI	**Flange connection design for tensile flanges** In addition to the hitherto flange connection design for compression flanges, there is now also a flange connection design for tensile flanges. For single web cross-sections also prestressed tensile flanges can be dealt with, i.e. if tendons exist outside of the web area in a tensile flange. All tendons are automatically assigned to the webs for box girders. A removal into the connecting flange area is therefore not possible.	9827
14.03.17	QUER	Before the calculation it is checked, whether the flange cross cuts run vertically. The coordinates are adjusted automatically.	9965
14.03.17	QUER	The web width of a T-beam or a trough cross-section is now being dimensioned.	9964
14.03.17	HAUZU	**Shrinkage coefficients according to DIN Fb** When using the DIN Fb the drying shrinkage has been multiplied with a safety factor, which is only valid according to DIN EN.	11087
14.03.17	NAZWEI	**Robustness reinforcement according to EN 1992-2, respectively, ÖNorm B 1992-2** The robustness reinforcement according to ÖNorm was wrongly calculated for I-beams. However, the robustness reinforcement was correctly calculated for T-beams or hollow sections.	10985
14.03.17	NAZWEI	The surface reinforcement for prestressed structural members according to DIN 1992-2 table J.4.1 is omitted when using EN or ÖNorm.	10984
14.03.17	NAZWEI	**Minimum reinforcement for the limitation of the initial cracking** The minimum reinforcement is analogously to DIN-Fb und reduced, if the restraint stress resultants are smaller than the cracking stress resultants and if there is no prestressing, respectively, prestressing wihtout bond.	10855
14.03.17	NAZWEI	**Requirements for the analyses in the serviceability limit state** A "Requirement class" was issued in the output of the design parameter when using the DIN EN. Since there is no requirement class in this standard, the text has been corrected. From now on, the requirements for the analyses in the SLS of road bridges or railroad bridges are issued with a hint to the tables. The alphabetic character in brackets corresponds with the old requirement class according to DIN-Fb and replaces the text about the requirements in the SLS in the further output list.	10744
14.03.17	QUER3	Problems in the calculation of the **effective width**s in the foundation slab of **arbitrary hollow cross-sections** have been resolved.	11041