Release Notes for tnxTower Version 8.2

This document describes Version 8.2 of tnxTower. Please contact TNX Support at support@towernx.com if you need update instructions.

New Features and Bug Fixes

v. 8.2.4.3   January 24, 2024

1. Added the KL/rib effective slenderness ratio limit for built-up double angle shapes in calculations of the flexural-torsional buckling strength. Previously, the calculated (KL/r)m value could exceed that limit.

2. Amended calculations of the controlling slenderness ratio for built-up double angle shapes in instances where the ai/ri ratio is greater than the KL/rib ratio.

3. Corrected the Lu and K output for horizontals. Previously, in some scenarios, such as where the 2.0H1/rout slenderness ratio (TIA-222-G, H, Table 4-7, Note 4) controls, the Lu and K values might not match the calculated and reported KL/r values.

4. Amended calculations of Minimum Bracing Resistance for four-sided towers. Previously, the 2.0H1/rout slenderness ratio (TIA-222-G, H, Table 4-7, Note 4) would not be considered.

5. Added girts to the list of horizontals, for which the 2.0H1/rout slenderness ratio (TIA-222-G, H, Table 4-7, Note 4) is considered.

6. Added end girts (top girt in the top-most section and bottom girt in the bottom-most section) to the list of horizontals, for which the Minimum Bracing Resistance requirements are checked.

7. Increased the range of the guy end fitting efficiency setting.

v. 8.2.3.1   December 11, 2023

1. Corrected the implementation of the combined bending and axial force interaction equations (TIA-222-G: 4.8.1.1 and 4.8.1.2, TIA-222-H: 4.8.1.1). Previously, the

application of these equations was not limited to solid round, tubular round, and single equal angle shapes.

2. Fixed an issue when opening a model input file with redundant sub-horizontal members. Previously, shape data saved for those members might cause input file reading errors.

v. 8.2.2.0   October 2, 2023

1. Corrected a bug in the file save routine. Previously, shape type data for some redundant members might not save correctly.

v. 8.2.1.0   September 11, 2023

1. Restored the candelabra file import feature. In the previous version of the program some candelabra models could not be imported.

2. Changed the classification of the A307 bolt grade to "threads included". Previously, threads for the A307 grade bolts were assumed excluded.

3. Modified the behavior of some data entry fields on the Tower Input pages to enable the copy/paste and fast selection functionalities.

v. 8.2.0.2   August 22, 2023 (revised)

1. Added a simple API allowing to execute analysis runs and produce reports for specific model files from the command line.

2. Added member type, size, and steel grade input for all redundant members.

3. Added connection details input for all redundant members.

4. Added automated material grade reduction for polygonal poles not meeting the maximum w/t ratio criteria (Table 4-8, Note 1., TIA-222-G, H).

5. Added drag and drop functionality for rows on the Feed Lines page.

6. Added automatic import of database properties for a Discrete Loads item entered by pasting its name and its database name only. Previously, the item's name would have to be reselected in the input table for the properties to be fetched.

7. Added the option of producing a supplementary data and results output file in the XML format.

8. Added the option of omitting the generation of auxiliary XLSX output files (tower section weights, monopole responses). In some computing environments, the routines generating those files might prevent the program from producing the main analysis and design report.

9. Changed the Discrete Loads calculations to better reflect provisions of the TIA-222 Standard. Previously, the calculations were based on formulas published in the tnxTower Manual, which produce results similar but not identical to results obtained using the corresponding formulas in the Design Wind Force on Appurtenances sections of the TIA-222-G and H Standards. For reference purposes, the program will use the previous Discrete Loads calculations if the Use Alternative Appurtenance EPA Calculation checkbox on the Options page is selected.

10. Changed the limits of tower section lengths, including monopole shafts, and end girt offsets to allow greater modeling flexibility.

11. Revised settings for the minimum bracing resistance calculations for secondary horizontals. It is now required that both the Secondary Horizontal Braces Leg and Calculate Forces in Supporting Bracing Members checkboxes on the Options page be selected.

12. Changed wording in the report from "Calculate Redundant Bracing Forces" to "Calculate Forces in Supporting Bracing Members" to reflect terminology used in the program's GUI and documentation.

13. Corrected the Unit Wt settings on the US Customary Units page. Previously, the Type setting for Unit Wt would change if the Type for the Density unit was changed.

14. Changed associations of Crest Height, Ground Elevation, Slope Distance, and Distance from Crest units on the Code page to the Coordinate category.

15. Corrected input columns display on the Geometry page for the K3A M Down bracing pattern.

16. Corrected the application of the TIA-222-H Annex S demand-capacity ratio. Previously, when the Code was switched from TIA-222-H to G, the ratio would be applied in the TIA-222-G output.

17. Eliminated references to Section 4.8.1 of the Standard in the analysis and design report, which might be inadequate in some cases.

18. Corrected a problem with opening read-only files. Previously, when an attempt was made to open such files, the program might exit without releasing the license.

19. Corrected an out of memory error that might be produced by the program with very large databases (structural components and/or appurtenances).

20. Changed the MS Access database file format for the TIA-222-G County Listings of Design Criteria from .mdb to .accdb.

21. Corrected a bug which caused a load entered on the User Forces page to be skipped if that load was preceded by a comment line.

22. Corrected calculations of supporting member forces. For some geometry and loading configurations the forces were calculated incorrectly.

23. Eliminated the minimum bracing resistance check for step members (located in one face only).

24. Corrected calculations of built-up angle members. Previously, the calculated value of the modified effective slenderness ratio (KL/r)m under TIA-222-H would not be assumed or limited to KL/rib, where applicable.

25. Corrected calculations of the net area of pipe members to include deductions due to bolt holes.

26. Modified calculations of the net area of solid round legs with PiRod sleeves by increasing the effective bolt hole diameter to its nominal diameter plus 1/16".

27. Corrected calculations of bolt bearing in leg sleeve connections in compression. Previously, the free end bearing strength was considered even if the connection was in compression.

28. Corrected the application of the Annex S Kes factor to ice thickness (weight and CaAa) for the Antenna Pole.

29. Corrected a reporting problem for models with Annex S considerations and the Include Bolts In Member Capacity option selected. Previously, the Annex S Demand-Capacity Ratio would not modify the utilization ratios of members controlled by their connection capacity.

30. Corrected a reporting bug where the Maximum Reactions output table for guys would include listings for Maximum and Minimum Moments and Torsion if the guy anchors were positioned exactly on the global X axis.