Release Notes for RISA-2D

Version 19.0 Enhancements/Corrections

- General:
  - Updated terminology in the program such that nodes can be tethered to other nodes rather than slaved.
  - Updated the warning message for models solved without P-Delta when P-Delta is required by code.
  - Corrected a graphical issue where the reported member deflection ratio turning red would not match the corresponding pass or fail design rule limit.
  - Fixed an issue with non-physical members causing incorrect moment capacity results in some models.
  - Resolved an issue on governing moving load steps missing in the Wall Panel Forces spreadsheet.
- Analysis:
  - Improved solution efficiency and behavior with compression and tension only members.
  - Improved solution convergence behavior with Tension Only, Compression Only, and Euler Buckling members in combination with P-Delta effects.
  - Corrected an issue where thermal loads applied to inactive tension/compression only members were erroneously included in the calculation.
  - Resolved a units issue where analysis offsets using metric units were not properly converted.
  - Fixed an issue where the self weight of wall panels could be erroneously affected by adjacent wall panels due to internal plate numbering of the wall panel submesh.
- Hot Rolled Steel:
  - Added A913 Gr.65 material to default U.S. hot rolled steel materials.
  - Updated cross sectional properties of Canadian wide flange W690x802 in the shape database.
  - Updated Cb limit to be 1.5 for single angle hot rolled members for the AISC 13th, 14th, and 15th Editions.
  - Updated the hot rolled steel compression capacity for wide flange members to consider the flexural-torsional buckling limit state if Ltorque is greater than either Lby-y or Lbz-z per Section E4 for AISC 15th and 14th Editions.
  - Updated the compression calculations for slender prismatic tapered wide flange members using AISC 360-16.
  - Updated the code checks for steel members with slender elements to properly include the limit state of FTB per AISC 14th Section E7.
  - Fixed an error in the Eurocode Hot Rolled Steel database where the Zy and Zz values were erroneously inverted for rectangular tube sections.
  - Corrected the calculation of the stiffened element depth, h, for wide flange, tapered wide flange, and channel shapes per the AISC 13th, 14th, and 15th Editions.
  - Corrected an issue where Cb was still being calculated despite a custom user input for unbraced length.
  - Fixed an issue resulting in negative weak axis moment capacity for channels.
  - Corrected an issue where bending was being considered erroneously in the unity check for single angles per Canadian code in some cases.
  - Revised the weak axis shear width-to-thickness ratio for WT shapes analyzed using AISC 14th Edition to use half the flange width instead of the full flange width.
  - Revised the flange slenderness ratio for wide flanges analyzed using AISC 15th Edition to use half the flange width instead of the full flange width.
  - Revised the leg slenderness classification for single angles per Canadian code to only consider the longer leg.
  - Resolved a conservative error in Qs calculation for tapered wide flange members when equation E7-9 was used.
  - Corrected the flexural-torsional buckling strength for singly symmetric tapered wide flange members to appropriately consider torsional buckling based on the AISC Design Guide 25.
- Cold Formed Steel:

- Added distortional buckling consideration per the commentary in Appendix 2 when calculating the compression capacity for ZS, CS single, and CS back-to-back shapes per the AISI S100-16.
- Updated the shear calculation for Z shapes to include two flanges for shear area.
- Updated the capacities reported in the member detail report to reflect the safety factors for members analyzed using AISI 1999:ASD.
- Corrected an issue where the distortional properties for CFS HU shapes were being calculated incorrectly.
- Fixed an issue where the flexural-torsional buckling stress used in calculating the compression capacity of CS F2F shapes was erroneously calculating sigma_t when the connector spacing was set to zero.
- Revised the flexural-torsional buckling stress, Fcre, per Section E2.2 for doubly symmetric shapes using AISI S100-16 to be calculated as sigma_t (Eq. 2.2-5) for doubly symmetric sections instead of Fcre (Eq. 2.2-1) which is for singly symmetric sections.
- Fixed an issue that prevented distortional buckling from properly being taken into account for the compression capacity of CS single and ZS shapes analyzed using AISI S100-12.
- Fixed an issue for custom ZS and CS shapes where the moment capacity based on lateral torsional buckling was not considered in the combined axial and bending interaction equation when a user input R factor was used.
- Corrected an issue where the incorrect unbraced length was being reported in some cases when the beam would experience negative bending.
- Corrected the safety factors used to calculate the allowable capacities reported in the detail report for members analyzed using older cold-formed steel codes 2010 or older.
- Corrected the safety factor for shear using the CANACERO 2016 code.
- Corrected an issue where an interaction equation from AISI 2012 code was being used in the AISI 2016 code in some cases.

- Aluminum:
  - Updated the lateral torsional buckling moment capacity (Mn,LTB) calculation for solid rectangular shapes to use Mnu instead of Mnp per ADM 2015 section F4.
  - Updated the shear capacity calculation to consider shear rupture per ADM 2015.
  - Updated the shear capacity calculation for flat webs supported on one edge per ADM 2015 Section G.3 instead of G.2.
  - Corrected the calculation of the stiffened element depth, h, for wide flange and channel shapes per the AISC 14th Edition.
  - Fixed an issue where the omega for rupture was used in the tensile yielding check when calculating the bending capacity for round tubes analyzed using ADM 2010.
  - Corrected an issue where moment capacity per ADM2015 check could be controlled by Section F8 from ADM2010.
  - Corrected Lv calculation for Round Tube shear capacity per ADM 2015, Section G4.
- Concrete:
  - Added the ACI 318-19 concrete code for beams, columns and wall panels.
  - Added additional metric bar sizes for the ASTM A615M rebar set.
  - Added the AS/NZS 4671:2001 rebar set.
  - Added a warning message for concrete wall seismic design to better explain the aspect ratio limits.
  - Refined deep beam qualification criteria according to ACI 318-14 Section 9.9.
  - Corrected an issue where minimum vertical reinforcement in concrete walls was being calculated too conservatively for some models.
- Wood:
  - Added LRFD wood design for NDS 2018 and NDS 2015 codes.
  - Updated the Simpson Holddown, Simpson Chord Straps, and Canadian Simpson Holddown schedules based on the 2017-2018 Simpson Strong-Tie Wood Construction Connectors catalog.
  - Improved optimization of wood wall panels designed using the FTAO method.
  - For multi-ply members, updated the Cp calculation to use the smaller Cp value from both directions instead of a conservative Le/d value.

    - Resolved an issue where CSA wood material properties would not properly save, causing a "check wood materials" warning message when opening the model.
    - Corrected capacity calculations for wood built-up columns with 2-5 plies per NDS section 15.3.
    - Resolved an issue where the compression capacity of wood members was reported incorrectly when both effective length factors Kyy and Kzz were set to zero.
    - Resolved an issue where the beam stability factor, CL, was erroneously being applied to the tension capacity for SCL members analyzed using the NDS 2018.
    - Corrected an issue where the incorrect value of Fb was used in the calculation for the adjusted bending design value for wood members 5in x 5in and larger.
    - Resolved an issue where the wood bending capacities using CSA 086 were reported in the wrong units in the Member Detail Report.
    - Resolved a graphical error for wood members using CSA 086-14 where the shear capacity was reported incorrectly in the Member Detail Report.
    - Corrected the shear design value for glulam members using NDS 18 LRFD.
- Masonry:
    - Corrected an issue where masonry walls in some cases were being designed over the user defined UC limit.
- Spreadsheets:
    - Revised the reported span for the maximum deflection ratio to say 'NA' instead of '0' when the deflection ratio is larger than L/10000.
    - Fixed a problem when using metric units where the Member Beam Deflection spreadsheet values were incorrectly increased by a factor of 25.4.
    - Resolved a display error that was only allowing one decimal place to be viewed in the weight column of the Material Take Off spreadsheet. Now it is dependent on the output decimal settings.
    - Fixed a graphical issue in the Material Takeoff spreadsheet where the incorrect units were displayed in the header.
- Operations:
    - Resolved an issue that would cause the program to close unexpectedly when viewing plate contour results and re-solving the model on Windows 7 using a non-Aero Theme desktop.