STRUCTURAL CONCRETE SOFTWARE SYSTEM

ADAPT-Builder® 20

Results Display Settings

(Result Browser)

Quick Reference Guide

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1 Selection Tools

Checkmark – Applies changes made to Display and Settings tab.

Left Arrow – Clears checked items for current selection or resets to previously set input.

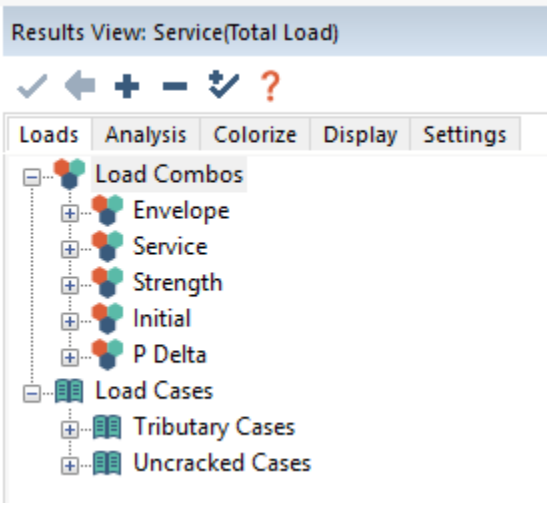
Plus (+) – Expands all sub-tree items or property grid items.

Minus (-) - Collapses all sub-tree items or property grid items.

Plus with checkmark – Collapses sub-tree categories with no checked item for Loading, Analysis and Colorize.

2 Loads Tab

Sets the load combination/envelope and load case for graphical analysis results display in the Analysis tab.



2.1 Load Combo

Lists solved combinations for each analysis/design option group and envelope. Load combination results apply to all analysis graphical result classifications in the **Analysis** tab.

2.1.1 Envelope

Set results envelope for solved Service or Strength combinations or combined envelope.

2.1.2 Service

Set results for solved combinations set to the **Service** analysis/design option type from Loading-Load Combinations.

2.1.3 Strength

Set results for solved combinations set to the **Strength** analysis/design option type from Loading-Load Combinations.

2.1.4 Initial

Set results for solved combinations set to the **Initial** analysis/design option type from Loading-Load Combinations.

2.1.5 P Delta

Set results for solved combinations set to the **P-Delta** analysis/design option type from Loading-Load Combinations.

2.1.6 No Code Check

Set results for solved combinations set to the **No Code Check** analysis/design option type from Loading-Load Combinations.

2.1.7 Cracked Deflection

Set results for solved combinations set to the **Cracked Deflection** analysis/design option type from Loading-Load Combinations.

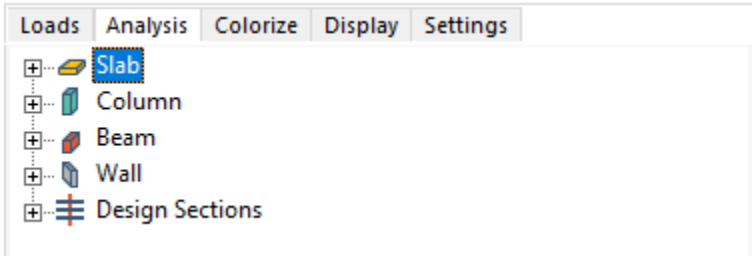
2.1.8 Long-Term Deflection

Set results for solved combinations set to the **Long-Term Deflection** analysis/design option type from Loading-Load Combinations.

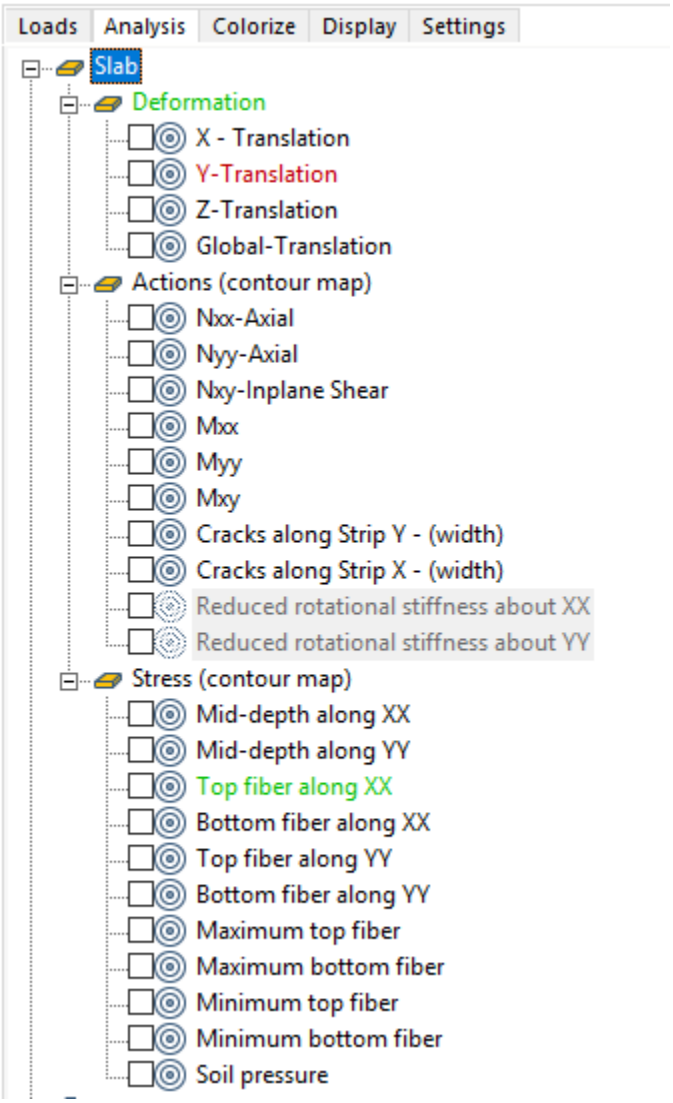
2.2 Load Cases

Lists solved load cases for Single-Level (L) and Multi-Level (G) analysis runs for the listed usage cases. **Uncracked** is the default usage case. Load case results only apply to Column and Wall action diagrams in the **Analysis** tab. Imported reactions from Tekla Strucural Designer (TSD) and CSI-Etabs are imported as Multi-Level (G) reactions and listed as such.

3 Analysis Tab



Sets the graphical results display for FEM analysis results, component design, and tributary load takedown.



3.1 Slab

Lists selection options for slab graphical results display.

3.1.1 Deformation

Lists selection options for slab deformation contour results display.

X-Translation: Displays contour results for slab deformation in global X direction. Positive follows global X axis orientation.

Y-Translation: Displays contour results for slab deformation in global Y direction. Positive follows global Y axis orientation.

Z-Translation: Displays contour results for slab deformation in global Z direction. Positive follows global Z axis orientation.

Global-Translation: Displays contour results for combined global deformation.

3.1.2 Actions (Contour Map)

Lists selection options for slab actions contour results display.

Nxx – Axial: Displays in-plane axial force contours in global X direction.

Nyy – Axial: Displays in-plane axial force contours in global Y direction.

Nxy – Inplane Shear: Displays XY in-plane shear contours.

Mxx: Displays slab moment contours for bending about global X direction. Positive indicates compression at top fiber.

Myy: Displays slab moment contours for bending about global Y direction. Positive indicates compression at top fiber.

Mxy: Displays slab twisting moment contours. Positive indicates compression at top fiber.

Cracks along Strip Y – (width): Displays crack width contours along Y strip direction.

Cracks along Strip X – (width): Displays crack widths contours along X strip direction.

Reduced rotational stiffness about XX: Displays contours representing ratio of Ieff/Ig for bending about XX global axis.

Reduced rotational stiffness about YY: Displays contours representing ratio of Ieff/Ig for bending about YY global axis.

3.1.3 Stress (Contour Map)

Lists selection options for slab stress contour results display.

Mid-depth along XX: Displays centroid stress contour along global X direction. Positive indicates tension.

Mid-depth along YY: Displays centroid stress contour along global Y direction. Positive indicates tension.

Top fiber along XX: Displays top fiber stress contour along global X direction. Positive indicates tension.

Bottom fiber along XX: Displays bottom fiber stress contour along global X direction. Positive indicates tension.

Top fiber along YY: Displays top fiber stress contour along global Y direction. Positive indicates tension.

Bottom fiber along YY: Displays bottom fiber stress contour along global Y direction. Positive indicates tension.

Maximum top fiber: Displays maximum top fiber principal stress. Positive indicates tension.

Maximum bottom fiber: Displays maximum bottom fiber principal stress. Positive indicates tension.

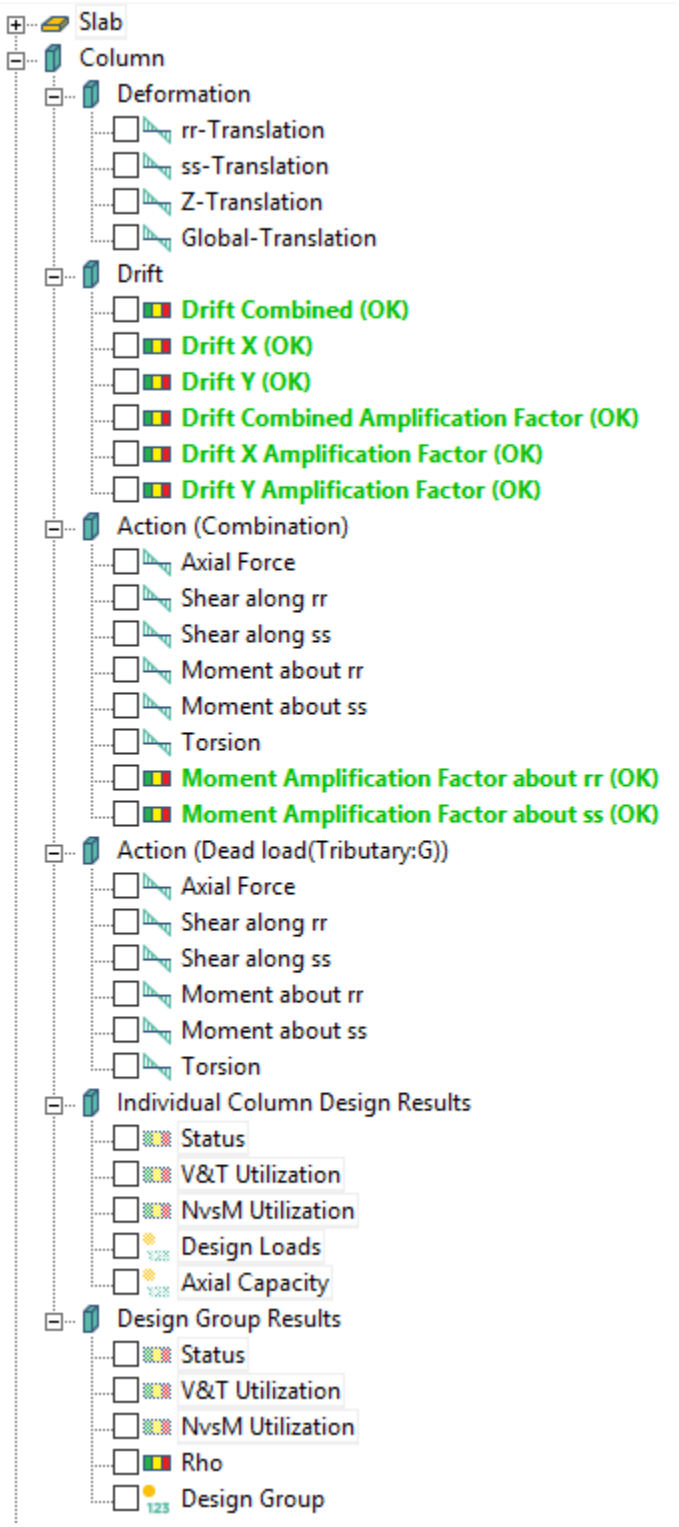
Minimum top fiber: Displays minimum top fiber principal stress. Positive indicates tension.

Minimum bottom fiber: Displays minimum bottom fiber principal stress. Positive indicates tension.

Soil pressure: Displays soil pressure distribution contour. Negative indicates compression.

3.2 Column

Lists selection options for column graphical results display.



3.2.1 Deformation

Lists selection options for column element deformation results display.

rr-Translation: Displays frame element results for column deformation in local rr direction. Positive follows local rr axis orientation.

ss-Translation: Displays frame element results for column deformation in local ss direction. Positive follows local ss axis orientation.

Z-Translation: Displays frame element results for column deformation in global Z direction. Positive follows global axis orientation.

Global-Translation: Displays column frame element results for combined global deformation.

3.2.2 Drift

Displays the inter-story drift % relative to the reference plane height for the selected load combination and produces a graphical check for Acceptable or Unacceptable for the user-defined Drift Maximum Allowable display setting.

Drift Combined: Displays the drift results and code check for global displacements for the selected combination or envelope.

Drift X: Displays the drift results and code check for X-direction displacements for the selected combination or envelope.

Drift Y: Displays the drift results and code check for Y-direction displacements for the selected combination or envelope.

Drift Combined Amplification Factor: When P-Delta combinations are selected, this option displays the ratio of the 2nd order to 1st order drift relative to global displacements. The drift ratios are calculated for the top and bottom nodes of column components and the maximum ratio is reported. This option is set to "NA" when a non P-Delta combination is selected.

Drift X Amplification Factor: When P-Delta combinations are selected, this option displays the ratio of the 2nd order to 1st order drift relative to X-direction displacements. The drift ratios are calculated for the top and bottom nodes of column components and the maximum ratio is reported. This option is set to "NA" when a non P-Delta combination is selected.

Drift Y Amplification Factor: When P-Delta combinations are selected, this option displays the ratio of the 2nd order to 1st order drift relative to Y-direction displacements. The drift ratios are calculated for the top and bottom nodes of column components and the maximum ratio is reported. This option is set to "NA" when a non P-Delta combination is selected.

3.2.3 Action (Combination)

Lists selection options for column element action results for selected load combination or envelope.

Axial Force: Displays frame element results for column axial force in global Z direction. Positive indicates tension.

Shear Along rr: Displays frame element results for column shear force in local rr direction.

Shear Along ss: Displays frame element results for column shear force in local ss direction.

Moment about rr: Displays frame element results for column moment about local rr direction. Positive indicates compression on local ss column face.

Moment about ss: Displays frame element results for column moment about local ss direction. Positive indicates compression on local rr column face.

Torsion: Displays frame element results for column torsion about Global Z direction.

Moment Amplification Factor about rr: When P-Delta combinations are selected this option reports the ratio of 2nd to 1st order moments about the local r-r column axis. The moment ratios are calculated for the top and bottom nodes of column components and the maximum ratio is reported. This option is set to "NA" when a non P-Delta combination is selected.

Moment Amplification Factor about ss: When P-Delta combinations are selected this option reports the ratio of 2nd to 1st order moments about the local s-s column axis. The moment ratios are calculated for the top and bottom nodes of column components and the maximum ratio is reported. This option is set to "NA" when a non P-Delta combination is selected.

3.2.4 Action (Load Case(Usage: Level or Global))

Lists selection options for column element action results for selected load case, usage and solution mode.

Axial Force: Displays frame element results for column axial force in global Z direction. Positive indicates tension.

Shear Along rr: Displays frame element results for column shear force in local rr direction.

Shear Along ss: Displays frame element results for column shear force in local rr direction.

Moment about rr: Displays frame element results for column moment about local rr direction. Positive indicates compression on local ss column face.

Moment about ss: Displays frame element results for column moment about local ss direction. Positive indicates compression on local rr column face.

Torsion: Displays frame element results for column torsion about Global Z direction.

3.2.5 Individual Column Design Results

Lists selection options for column code check results.

Status: Displays the code check status of columns. Includes NA (has not been performed or column is not assigned to group), Acceptable, Warning (result violates code requirement), Borderline (within 10% utilization) and Unacceptable (Utilization greater than user-input value).

V&T Utilization: Displays shear and torsion utilization as NA, Acceptable or Unacceptable. Value indicates interaction value for the column.

NvsM Utilization: Displays axial and moment utilization as NA, Acceptable or Unacceptable. Value indicates interaction value for the column.

Design Loads: Displays the column forces and moments for the code check producing the greatest utilization values.

Axial Capacity: Displays the maximum column axial capacity for the selected design code.

3.2.6 Design Group Results

Lists selection options for column design group results.

Status: Displays the design status of columns related to the controlling condition for the overall design group. Includes NA (has not been performed or column is not assigned to group), Acceptable, Warning (result violates code requirement), Borderline (within 10% utilization) and Unacceptable (Utilization greater than user-input value).

V&T Utilization: Displays shear and torsion utilization as NA, Acceptable or Unacceptable. Value indicates controlling interaction value for the design group.

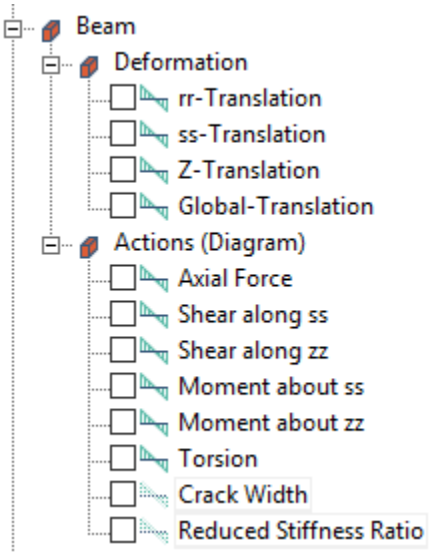
NvsM Utilization: Displays axial and moment utilization as NA, Acceptable or Unacceptable. Value indicates controlling interaction value for the design group.

Rho: Displays the ratio of area of reinforcement to the gross area of column section for the design group.

Design Group – Displays the name of design group assigned to the column.

3.3 Beam

Lists selection options for beam graphical results display.



3.3.1 Deformation

Lists selection options for column element deformation results display.

rr-Translation: Displays frame element results for beam deformation in local rr direction. Positive follows local rr axis orientation.

ss-Translation: Displays frame element results for beam deformation in local ss direction. Positive follows local ss axis orientation.

Z-Translation: Displays frame element results for beam deformation in global Z direction. Positive follows global axis orientation.

Global-Translation: Displays beam frame element results for combined global deformation.

3.3.2 Actions (Diagram)

Lists selection options for beam frame element actions for selected load combination or envelope.

Axial Force: Displays frame element results for beam axial force in along local rr direction. Positive indicates tension.

Shear Along ss: Displays frame element results for beam shear force in local ss direction (in-plane).

Shear Along zz: Displays frame element results for beam shear force in local zz direction (normal).

Torsion – Displays frame element results for beam torsion about local rr direction.

Moment about ss – Displays frame element results for beam moment about local ss direction. Positive indicates compression on global Z face.

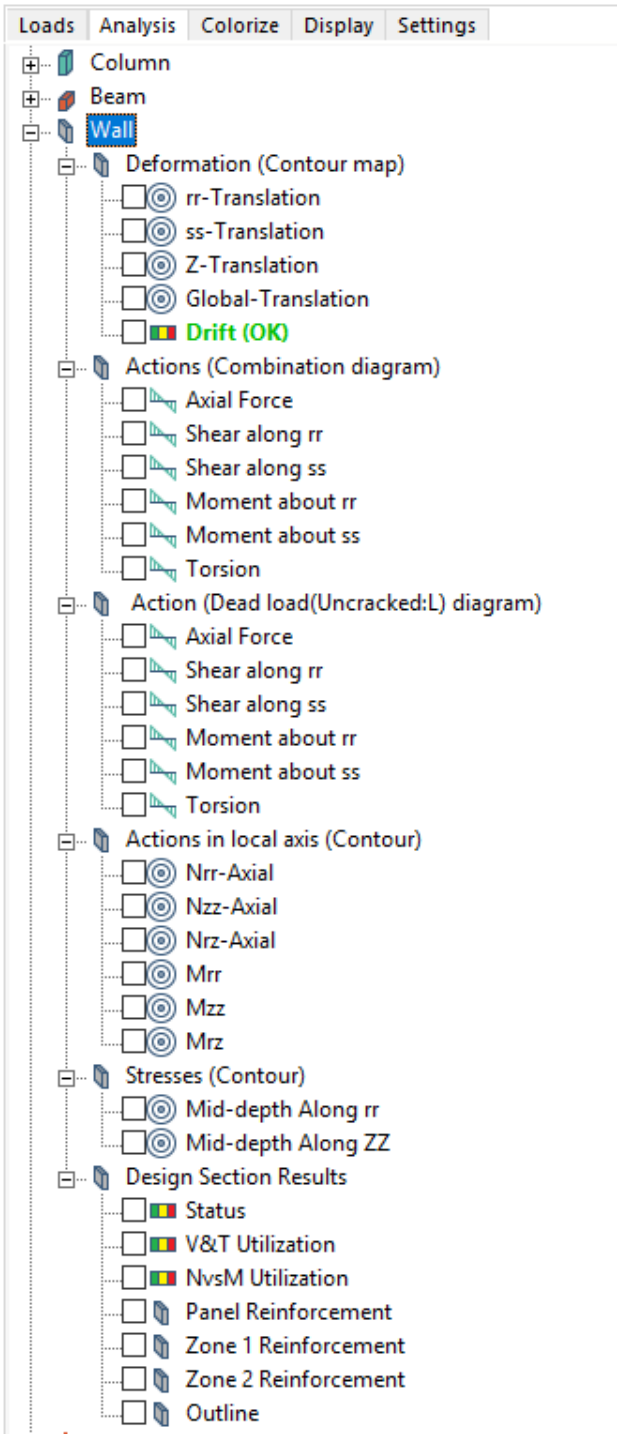
Moment about zz: Displays frame element results for beam moment about global Z direction. Positive indicates compression on local ss beam face.

Crack Width: Reports the crack width for beam frame elements when the analysis/design option is set to report.

Reduced Stiffness Ratio (Ieff/Ig): Displays the ratio of Ieff to Ig for beam frame elements for cracked deflection load combinations.

3.4 Wall

Lists selection options for wall graphical results display.



3.4.1 Deformation (Contour Map)

Lists selection options for wall deformation contour results display.

rr-Translation: Displays contour results for wall deformation in local rr direction. Positive follows local rr axis orientation.

ss-Translation: Displays contour results for wall deformation in local ss direction. Positive follows local ss axis orientation.

Z-Translation: Displays contour results for wall deformation in global Z direction. Positive follows global Z axis orientation.

Global-Translation: Displays wall contour results for combined global deformation.

Drift: Displays the inter-story drift ratio relative to the reference plane height for the selected load combination and produces a graphical check for Acceptable or Unacceptable for the user-defined **Drift Maximum Allowable** display setting.

3.4.2 Action (Combination)

Lists selection options for combined wall shell element action results for selected load combination or envelope.

Axial Force: Displays wall diagram results for wall axial force in global Z direction. Positive indicates tension.

Shear Along rr: Displays wall diagram results for wall shear force in local rr direction.

Shear Along ss: Displays wall diagram results for wall shear force in local ss direction.

Moment about rr: Displays wall diagram results for wall moment about local rr direction (weak-axis bending). Positive indicates compression on local ss wall face.

Moment about ss: Displays wall diagram results for wall moment about local ss direction (strong-axis bending) . Positive indicates compression on local rr wall face.

Torsion: Displays wall diagram results for wall torsion about Global Z direction.

3.4.3 Action (Load Case(Usage: Level or Global))

Lists selection options for combined wall shell element action results for selected load case, usage and solution mode.

Axial Force: Displays wall diagram results for wall axial force in global Z direction. Positive indicates tension.

Shear Along rr: Displays wall diagram results for wall shear force in local rr direction.

Shear Along ss: Displays wall diagram results for wall shear force in local ss direction.

Moment about rr: Displays wall diagram results for wall moment about local rr direction (weak-axis bending). Positive indicates compression on local ss wall face.

Moment about ss: Displays wall diagram results for wall moment about local ss direction (strong-axis bending) . Positive indicates compression on local rr column face.

Torsion: Displays wall diagram results for wall torsion about Global Z direction.

3.4.4 Actions in local axis (Contour)

Lists selection options for wall action contour results display.

Nrr – Axial: Displays in-plane axial force contours in local rr direction.

Nzz – Axial: Displays in-plane axial force contours in local zz direction.

Nrz – In-plane Shear: Displays rz in-plane shear contours.

Mrr: Displays wall moment contours for bending about local rr direction.

Mzz: Displays wall moment contours for bending about local zz direction.

Mrz: Displays wall twisting moment contours.

3.4.5 Stresses (Contour)

Lists selection options for slab stress contour results display.

Mid-depth along rr: Displays centroid stress contour along local rr direction. Positive indicates tension.

Mid-depth along ZZ: Displays centroid stress contour along global Z direction. Positive indicates tension.

3.4.6 Design Section Results

Lists selection options for wall section code check or design results.

Status: Displays the code check or design status of columns. Includes NA (has not been performed or wall is not assigned to group), Acceptable, Warning (result violates code requirement), Borderline (within 10% utilization) and Unacceptable (Utilization greater than user-input value).

V&T Utilization: Displays shear and torsion utilization for the result set range. Values in range indicate interaction value for the wall sections.

NvsM Utilization: Displays axial and moment utilization for the result set range. Values in range indicate interaction value for the wall sections.

Panel Reinforcement: Displays wall section panel vertical and horizontal reinforcement and spacing.

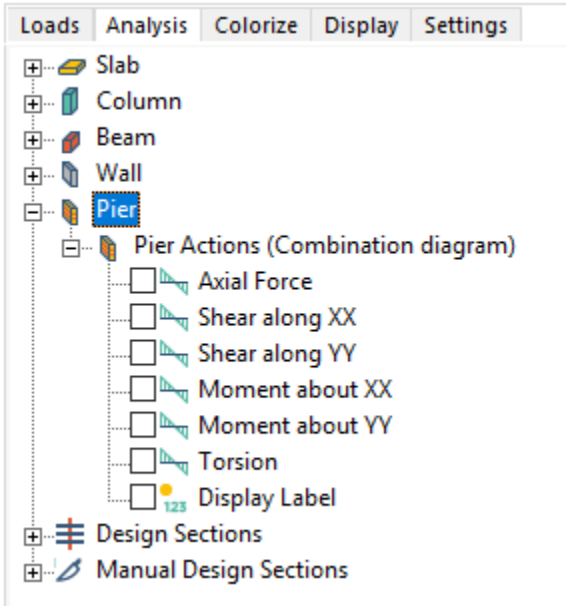
Zone 1 Reinforcement: Displays wall zone 1 vertical bar size and quantity and tie size and spacing.

Zone 2 Reinforcement: Displays wall zone 2 vertical bar size and quantity and tie size and spacing.

Outline: Displays the generated wall section outlines at the top and bottom of walls.

3.5 Pier

Lists selection options for pier graphical results display.



3.5.1 Pier Actions (Combination diagram)

Lists selection options for wall pier resultant actions for selected load combination or envelope.

Axial Force: Displays resultant wall pier axial force in global Z direction.

Shear Along XX: Displays resultant wall pier shear force in global X direction.

Shear Along ss: Displays resultant wall pier shear force in global Y direction.

Moment about XX: Displays resultant wall pier moment about global X direction.

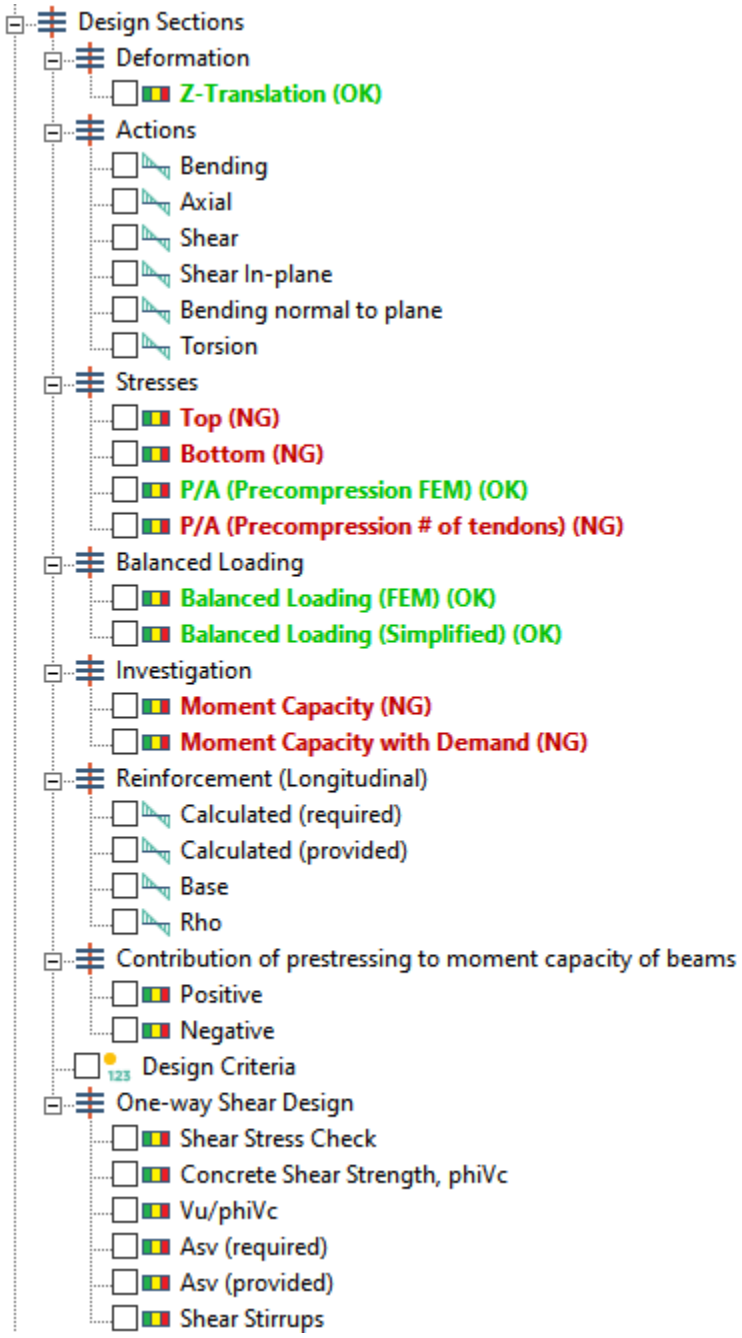
Moment about YY: Displays resultant wall pier moment about global Y direction.

Torsion: Displays resultant wall pier torsion about global Z direction.

Display Label: Displays the pier labels on assigned piers.

3.6 Design Sections

Lists selection options for design sections graphical results display.



3.6.1 Deformation

Lists selection option for Z-translation values at design sections for selected load combination or envelope.

Z-Translation: Displays Z-translation at design sections and span/deflection ratio. Green indicates meets the user-defined **Maximum span/deflection** ratio. Pink indicates exceeds the allowable value.

3.6.2 Actions

Lists selection options for design section actions for selected load combination or envelope.

Bending: Displays design section bending moment about axis in direction of section face. Positive produces compression on top fiber.

Axial: Displays design section axial force. Positive indicates compressive force.

Shear: Displays design section shear force normal to section face.

Shear in-plane: Displays design section shear force in direction of section face.

Bending normal-to-plane: Displays design section bending moment about axis normal to section face (global Z direction).

Torsion: Displays design section torsion.

3.6.3 Stresses

Lists selection options for design section stresses for selected load combination or envelope. Results only produced for service and initial combinations.

Top: Displays design section bending stress at the top fiber. Positive indicates tension. Green indicates stress does not exceed user-defined allowable tensile or compressive stress. Pink indicates exceeds allowable value.

Bottom: Displays design section bending stress at the bottom fiber. Positive indicates tension. Green indicates stress does not exceed user-defined allowable tensile or compressive stress. Pink indicates exceeds allowable value.

P/A (Precompression FEM): Displays the precompressive stress defined by axial force in the section over the gross area of the section. Negative indicates compression. Green indicates stress exceeds the user-defined **minimum precompression** display setting. Pink indicates minimum value is not met.

P/A (Precompression # of tendons): Displays the precompressive stress defined by total summation of tendon force intersecting in the section face over

the gross area of the section. Negative indicates compression. Green indicates stress exceeds the user-defined **minimum precompression** display setting. Pink indicates minimum value is not met.

3.6.4 Balanced Loading

Lists selection options for %balanced loading check for total dead load.

Balanced Loading (FEM): Displays balanced loading % (PT over total dead load) with respect to nodal uplift forces produced by all PT tendons passing through the design strip tributary for the span. Green indicates the **minimum %balanced** load is met.

Balanced Loading (Simplified): Displays the balanced loading % (PT over total dead load) with respect to the tendon average uplift for tendons located within the design strip tributary for the span and located within the user-defined **Simple load balance angle** display setting relative to the support line direction. Green indicates the **minimum %balanced** load is met.

3.6.5 Investigation

Lists the selection options for positive and negative moment capacity and enveloped demand graphs.

Moment Capacity: Displays positive (green) and negative (blue) moment graphs with capacity values and controlling demand/capacity ratios for the envelope of strength demand moments.

Moment Capacity with Demand: Displays positive (green) and negative (blue) moment graphs and the strength demand envelope graph (gray) with capacity and demand values and controlling demand/capacity ratios for the envelope of strength demand moments. Green indicates the demand/capacity ratio at a section is 1.0 or less. Pink indicates the demand/capacity ratio exceeds 1.0.

3.6.6 Reinforcement (Longitudinal)

Displays graphical results for area of longitudinal reinforcement and percentage of reinforcement relative to section area for calculated and user-defined (base) rebar.

Calculated (required): Displays the required area of longitudinal reinforcement at each design section on the design strip both for top and bottom section locations.

Calculated (provided): Displays the provided area of longitudinal reinforcement at each design section on the design strip both for top and bottom section locations. This option requires you to have calculated the rebar plan for the selected load combination.

Base: Displays the area of longitudinal reinforcment entered as base-reinforcement by the user at each design section both for top and bottom section locations.

Rho: Displays the percentage of base and calculated reinforcement at the top and bottom locations of the design sections.

3.6.7 Contribution of prestressing to moment capacity of beams

Lists selection options for the graphical check of positive and negative bending capacity derived from PT. Only produces a result when the option is selected in **Criteria-Analysis/design options.**

Positive: Indicates the ratio of positive capacity derived from PT cables/total positive capacity. Green indicates the ratio is less than or equal to the user-defined setting from **Criteria-Analysis/design options.** Pink indicates the ratio exceeds the user-defined limit.

Negative: Indicates the ratio of negative capacity derived from PT cables/total negative capacity. Green indicates the ratio is less than or equal to the user-defined setting from **Criteria-Analysis/design options.** Pink indicates the ratio exceeds the user-defined limit.

3.6.8 Design Criteria

Displays the design criteria the design section is set for. Beam, One-Way Slab or Two-Way Slab.

3.6.9 One-Way Shear Design

Lists selection options for the graphical check of one-way shear results. Only produces a result when a one-way or beam criteria support line is designed. An option for graphical representation of shear reinforcement is also included.

Shear Stress Check: Indicates if the design section passes code required stress checks. Green indicates no reinforcement is required for the design section. Blue indicates reinforcement is required for the section. The calculated shear reinforcement can be shown graphically using options discussed later. Red indicates the one-way shear stress at the section exceeds the code maximum allowable value.

Concrete Shear Strength, phiVc: Reports the shear capacity of the concrete at each design section.

Vu/phiVc: Reports the demand/capacity ratio for the selected strength load combination or envelope.

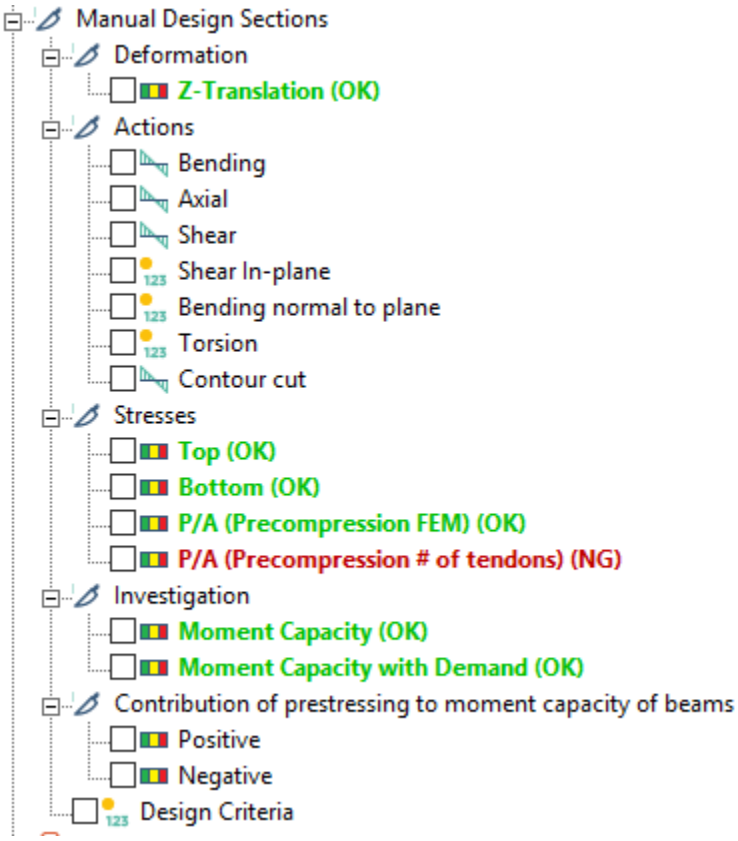
Asv (Required): Reports the required area of shear reinforcement per ft (US units) or per meter (SI units) based on calculation.

Asv (Provided): Reports the provided area of shear reinforcement per ft (US units) or per meter (SI units) based on input of number of legs and stirrup size selected for the design.

Shear Stirrups: Reports the number of stirrups and associated spacing in each reinforcement zone along the beam or one-way slab. The total length is given for each reinforced zone.

3.7 Manual Design Sections

Lists selection options for manual design sections graphical results display.



3.7.1 Deformation

Lists selection option for Z-translation values at manual design sections for selected load combination or envelope.

Z-Translation: Displays Z-translation at manual design sections and span/deflection ratio. Green indicates meets the user-defined **Maximum span/deflection** ratio. Pink indicates exceeds the allowable value.

3.7.2 Actions

Lists selection options for manual design section actions for selected load combination or envelope.

Bending: Displays manual design section bending moment about axis in direction of section face. Positive produces compression on top fiber.

Axial: Displays manual design section axial force. Positive indicates compressive force.

Shear: Displays manual design section shear force normal to section face.

Shear in-plane: Displays manual design section shear force in direction of section face.

Bending normal-to-plane: Displays manual design section bending moment about axis normal to section face (global Z direction).

Torsion: Displays manual design section torsion.

3.7.3 Stresses

Lists selection options for manual design section stresses for selected load combination or envelope. Results only produced for service and initial combinations.

Top: Displays manual design section bending stress at the top fiber. Positive indicates tension. Green indicates stress does not exceed user-defined allowable tensile or compressive stress. Pink indicates exceeds allowable value.

Bottom: Displays manual design section bending stress at the bottom fiber. Positive indicates tension. Green indicates stress does not exceed user-defined allowable tensile or compressive stress. Pink indicates exceeds allowable value.

P/A (Precompression FEM): Displays the precompressive stress defined by axial force in the manual section over the gross area of the section. Negative indicates compression. Green indicates stress exceeds the user-defined **minimum precompression** display setting. Pink indicates minimum value is not met.

P/A (Precompression # of tendons): Displays the precompressive stress defined by total summation of tendon force intersecting in the section face over the gross area of the manual section. Negative indicates compression. Green indicates stress exceeds the user-defined **minimum precompression** display setting. Pink indicates minimum value is not met.

3.7.4 Investigation

Lists the selection options for positive and negative moment capacity and enveloped demand values on the manual section.

Moment Capacity: Displays relevant capacity (positive or negative) at the manual section and the demand/capacity ratio. Green indicates the D/C ratio is less or equal to 1.0. Pink indicates the ratio exceeds 1.0.

Moment Capacity with Demand: Displays the positive and negative capacities, demand moment values and the demand/capacity ratios at the manual section. Green indicates the D/C ratio is less or equal to 1.0. Pink indicates the ratio exceeds 1.0.

3.7.5 Contribution of prestressing to moment capacity of beams

Lists selection options for the graphical check of positive and negative bending capacity derived from PT. Only produces a result when the option is selected in **Criteria-Analysis/design options.**

Positive: Indicates the ratio of positive capacity derived from PT cables/total positive capacity. Green indicates the ratio is less than or equal to the user-defined setting from **Criteria-Analysis/design options.** Pink indicates the ratio exceeds the user-defined limit.

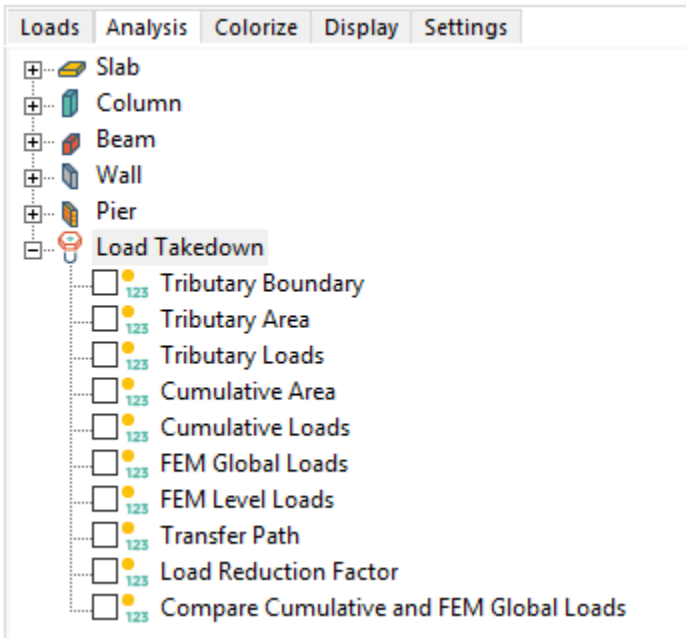
Negative: Indicates the ratio of negative capacity derived from PT cables/total negative capacity. Green indicates the ratio is less than or equal to the user-defined setting from **Criteria-Analysis/design options.** Pink indicates the ratio exceeds the user-defined limit.

3.7.6 Design Criteria

Displays the design criteria the manual design section is set for. Beam, One-Way Slab or Two-Way Slab.

3.8 Load Takedown

Lists selection options for load takedown graphical results display.



Tributary Boundary: Displays the tributary region in red outline for loads applied in the global Z direction for columns and walls.

Tributary Area: Reports the tributary area for columns and walls for the active level.

Tributary Loads: Reports the tributary reactions for columns and walls for loads applied in the global Z direction for the active level.

Cumulative Area: Reports the cumulative area for columns and walls for the active level and all levels above active.

Cumulative Loads: Reports the cumulative tributary reactions for columns and walls for loads applied in the global Z direction for the active level and all levels above.

FEM Global Loads: Reports the general load case axial forces for the multi-level solution most recently solved.

FEM Level Loads: Reports the general load case axial forces for the single-level solution most recently solved.

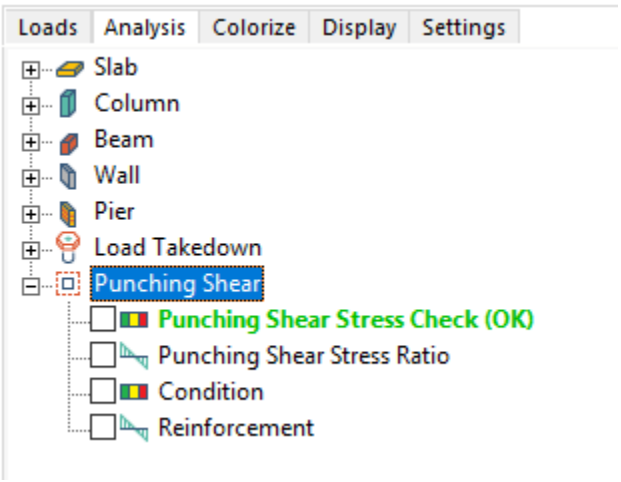
Transfer Path: Displays the transfer path (indicated by a red line) and % of load distributed over the path for transferred columns, walls and beams to supporting columns and walls below.

Load Reduction Factor: Displays the load reduction factor for columns and walls as calculated per user-defined cumulative areas and factors.

Compare Cumulative and FEM Global Loads: Displays a % difference between axial forces of the global FEM solution and the tributary load take-down calculation. Percentage difference exceeding the user-defined display setting is indicated by pink text.

3.9 Punching Shear

Lists selection options for punching shear graphical results display for the selected service load combination.



Punching Shear Stress Check: Displays a color-coded graphical check of the punching shear outcome. Includes NA (for columns connected to a wall or beam or if the check has not been performed), OK, Reinforce, or Exceeds Code.

Punching Shear Stress Ratio: Displays the controlling stress ratios for the local axes rr and ss or combined along with the associated column ID. The program will also report the governing load combination and critical section for the column.

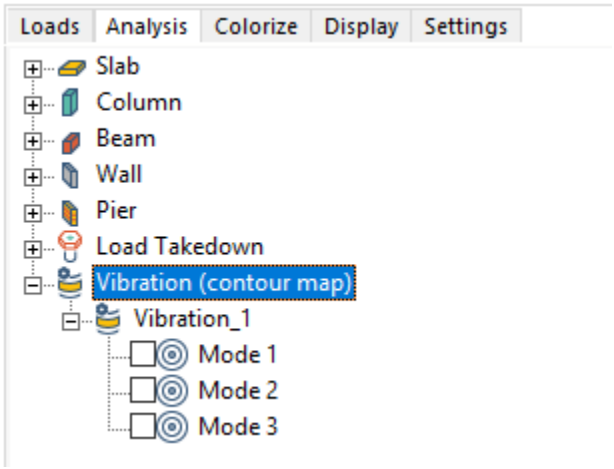
Condition: Displays a color-coded graphical indication of the condition the column is checked for and the shape of the critical section used to evaluate the critical sections.

Includes Corner, End/Edge, or Interior. The effective depth of the critical section is also reported graphically with this option.

Reinforcement: Displays a text summary of the punching shear design. The result indicates bar size used, total number of rails (rails along A column side, rails along B column side) – quantity and spacing of studs and (total rail length).

3.10 Vibration (contour map)

Lists selection options for vibration graphical contour results display for the solved vibration combinations.



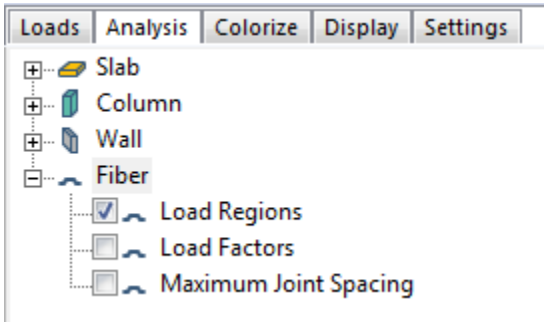
3.10.1 Combination Name

Lists the solved vibration combinations names.

Mode X: Displays the contour map of normalized amplitude for the selected mode and reports the frequency and period for the mode.

3.11 Fiber

Lists selection options for Steel Fiber design parameters when the design type defined in the concrete material properties for fiber is set to mat or slab-on-grade.



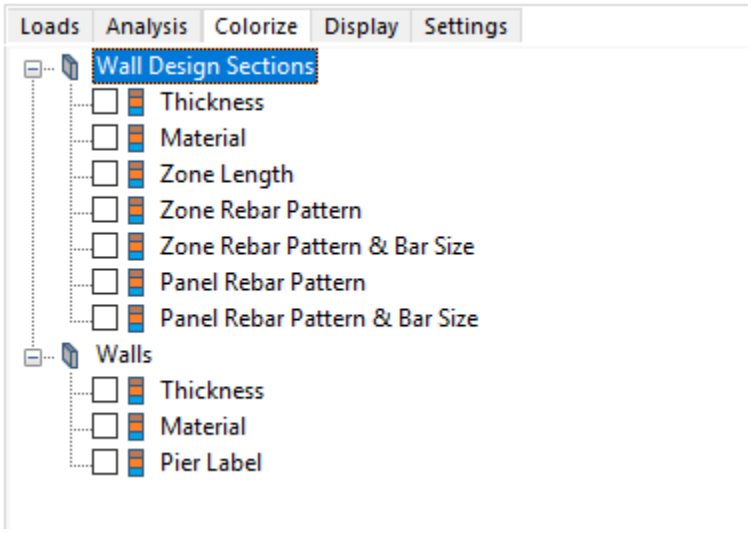
Load Regions: Displays the edge, corner and interior regions used for the calculation of load modification factors for the non-linear analysis option of mat and slab-on-grade design types with fiber.

Load Factors: Displays the load transfer factor across joints when the design type of slab-on-grade is selected and the non-linearity factor, R, for design types: mat, slab-on-grade and slab-on-piles.

Maximum Joint Spacing: Displays the maximum joint spacing value for slab-on-grade design types as calculated by the software.

4 Colorize Tab

Sets the graphical display for colorization of Wall Design Section and Wall property data.



4.1 Wall Design Sections

Lists selection options for colorization of wall design input properties and design parameters.

Thickness: Displays colorized groups for wall design sections having identical thickness.

Material: Displays colorized groups for wall design sections having identical material assignments.

Zone Length: Displays colorized groups for walls having identical zone lengths for end Zones 1 and 2.

Zone Rebar Pattern: Displays colorized groups for walls having identical end zone reinforcement arrangements.

Zone Rebar Pattern & Bar Size: Displays colorized groups for walls having identical end zone reinforcement arrangements and bar size.

Panel Rebar Pattern: Displays colorized groups for walls having identical wall panel reinforcement arrangements.

Panel Rebar Pattern & Bar Size: Displays colorized groups for walls having identical wall panel reinforcement arrangements and bar size.

4.2 Wall

Lists selection options for colorization of wall design input properties.

Thickness: Displays colorized groups for walls having identical thickness.

Material: Displays colorized groups for walls having identical material assignments.

Pier Label: Displays colorized groups for walls having identical pier assignments.

5 Display Tab

Sets the threshold values and other display settings for column and wall component code check and design graphical results.

Loads | Analysis | Colorize | Display | Settings

Property	Value
Design Sections	
Balanced loading minimum	50.00 %
Balanced loading maximum	100.00 %
Maximum span/deflection ratio, L/	360
Precompression minimum allowable	125.00 Psi
Precompression maximum allowable	300.00 Psi
Allowable Stress Display	Exceeds Only
Simple Load Balance Angle	60.00 deg
Components	
Drift maximum allowable	0.50 %
Rho display	Value
Rho maximum allowable	3.00 %
Utilization Display	Value
Utilization maximum allowable	1.00 %
Moment Amplification max allowable	1.40
Drift Amplification max allowable	1.40
Compare Cumulative and FEM Global L...	10.00 %
Wall Design Sections	
Reinforcement Display	Number of Bars
Line thickness	2
Display Text for Active Level	No
Section Text for Each Wall	All

5.1 Design Sections

Lists design setting options for evaluation of design sections for deflection display and post-tensioned design criteria.

Balanced loading minimum: Sets the minimum allowed dead load balanced ratio for the graphical check. Spans with %balanced dead load less than this value will show sections as pink. Spans greater than this value will display sections as green.

Balanced loading maximum: Sets the maximum allowed dead load balanced ratio for preloading the **Tendon Optimizer** default settings. This value is not checked graphically.

Maximum Span/deflection ratio: Sets the value limit for the design strip span length over the maximum design section deflection in the span. Does not apply to cracked deflection results.

Precompression minimum allowable: Sets the minimum allowed precompression for the graphical check. Design sections with precompression less than this value will appear pink. Sections greater than this value will appear green.

Precompression maximum allowable: Sets the maximum allowed precompression for preloading the **Tendon Optimizer** default settings. This value is not checked graphically.

Allowable Stress Display: Can be set to None, Exceeds Only, or All Limits. Controls display of the locations where allowable stresses exceed inputs for tension and compression or both limits for post-tensioned designs.

Simple Load Balance Angle: Designates the angle between support line and tendons for consideration of the tendon in the simplified load balanced method. If the angle exceeds the input, the tendon uplift is not accounted for in the calculation.

5.2 Components

Lists design setting options for evaluation of column design and graphical results display.

Drift maximum allowable: Sets the maximum allowable drift as a percentage of story height. If the inter-story drift over story height (%) exceeds the maximum, the columns and walls will be shown as unacceptable. Otherwise, they are displayed as being acceptable.

Rho display: Sets the display type as Value or Status for % of reinforcement over cross-sectional area of the design group. Value reports % and status indicates Acceptable, Unacceptable, or NA.

Rho maximum allowable: Sets the maximum allowable % for reinforcement over cross-sectional area of the column for the design group rho check.

Utilization Display: Sets the display type as Value or Status for interaction utilization for column code check and design results display. Value reports % and status indicates Acceptable, Unacceptable, or NA.

Utilization maximum allowable: Sets the maximum allowable % for V-T and N-M utilization for the check utilization display value check.

Moment amplification maximum allowable: Sets the maximum allowable ratio for the P-Delta moment amplification graphical code check of 2^{nd} to 1^{st} order moments. Default set to 1.4.

Drift amplification maximum allowable: Sets the maximum allowable ratio for the P-Delta drift amplification graphical code check of 2nd to 1st drift. Default set to 1.4.

Compare Cumulative and FEM Global Loads: Sets the threshold % for comparing FEM and Cumulative loads. When the differential between load values exceeds the threshold, values are displayed as pink for the graphical check.

5.3 Wall Design Sections

Lists section graphical display options for design and code check wall design sections.

Reinforcement Display: Sets the display type as Number of bars, area, rho or All for zone and panel reinforcement display of wall design sections.

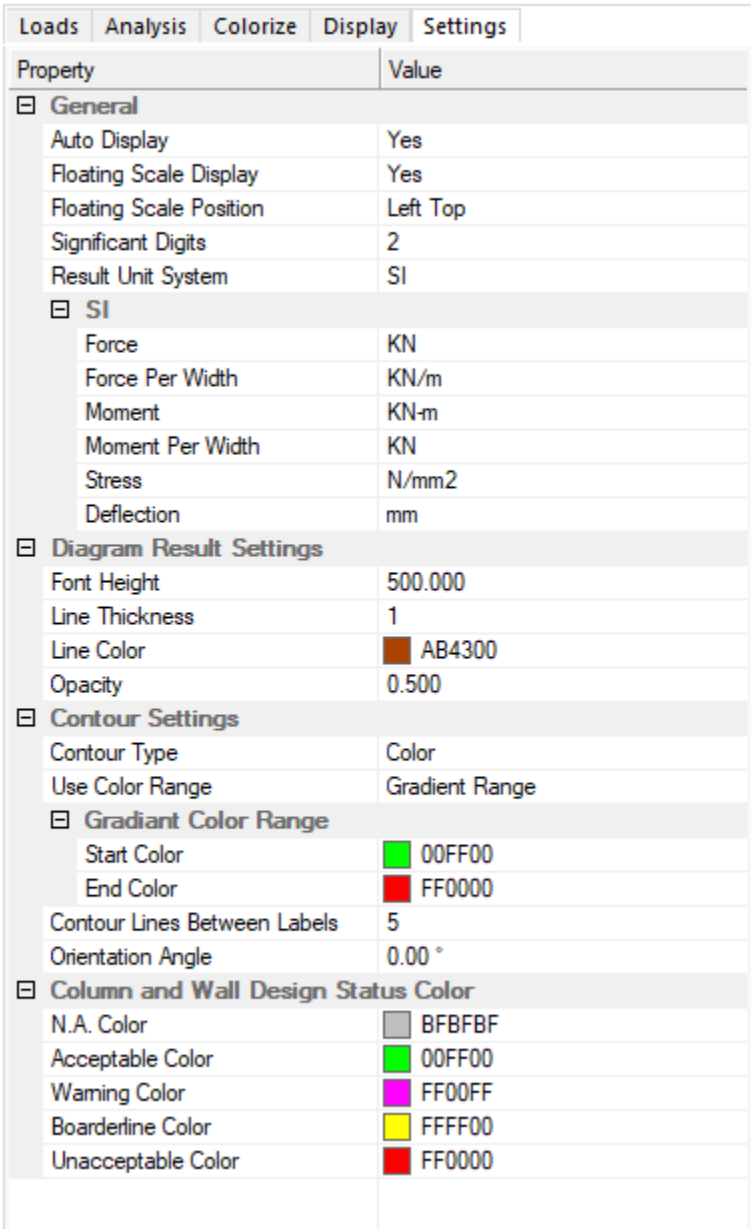
Line thickness: Sets the line thickness for the wall design section outline.

Display Text for Active Level: Sets the display of zone and panel reinforcement of wall design sections for the active level only when set to YES.

Section Text for Each Wall: Sets the display of zone and panel reinforcement of wall design sections at the top or bottom wall sections or both.

6 Settings Tab

Sets the general FEM and frame element view settings for the graphical results display.



6.1 General

Lists general graphical display, numerical precision and unit system settings.

Auto Display: Sets the Result Display Settings window to auto-open after analysis and section design is complete.

Floating Scale Display: Sets the floating scale display for graphical results to appear when a result option is selected.

Floating Scale Position: Sets the position of the floating scale in the graphical modeling window.

Significant Digits: Sets the significant digits for numerical value display of the floating scale, component result diagrams and design sections.

Result Unit System: Sets the unit system for the graphical results display.

Unit System: Reports the selected unit system.

- **Force: Force units**
- **Force Per Width: Force Per Width units**
- **Moment: Moment units**
- **Moment per Width: Moment per Width units**
- **Stress: Stress units**
- **Deflection: Deflection units**

6.2 Diagram Result Settings

Lists result settings for graphical results display of component and section diagrams.

Font Height: Sets the graphical results diagram text font height.

Line Thickness: Sets the graphical results diagram line thickness.

Line Color: Sets the graphical results diagram line color.

Opacity: Sets the graphical results diagram fill opacity.

6.3 Contour Settings

Lists result settings for graphical results display of slab and wall finite element contours.

Contour Type: Sets the contour type as a color map or line contours.

User Color Range: Sets the contour map type as a gradient of two colors or user-defined color range.

6.3.1 Gradient Color Range

Sets the colors for the gradient color map type.

Start Color: Top end color for gradient range.

End Color: Bottom end color for gradient range.

Contour Lines Between Labels: Sets the frequency of contour lines displaying values.

Orientation Angle: Sets the orientation angle relative to the global X-axis (deg)

6.4 Column and Wall Design Status Color

Sets the graphical status display colors for column and wall design result options.

NA Color: Sets the color for NA status.

Acceptable Color: Sets the color for Acceptable status.

Warning Color: Sets the color for Warning status.

Borderline Color: Sets the color for Borderline status.

Unacceptable Color: Sets the color for Unacceptable status.