

SAP2000

Explore SAP2000 Test Problems

List of SAP2000 Test Problems

Title	Description
Effect of insertion point on beam reactions	How insertion point affects horizontal reactions and flexural response of a simply supported beam.
Tendon force vs. frame response	Tendon application is validated by comparing tendon forces to those in an equivalent frame system.
Moving-load analysis section cuts	Verification of section-cut forces generated during moving-load analysis.
Staged construction of a five-story column	Creep application, addition of nodes to deformed configuration, and verification against manual calculations are given for the staged construction of a five-story column.
Acceleration loading	Demonstrate acceleration loading and validate relative/absolute acceleration, velocity, and displacement.
Align solid and hollow sections	Model relative positive position for frame sections which have identical outlines, but different center-of-gravity locations due to one section being hollow.
Two-span girder simply-supported for DL and continuous for LL	Modeling demonstration for a two-span girder which is simply-supported for DL and continuous for LL.
Temperature-gradient loading for bridge objects	This test problem demonstrates CSI Software calculation and application of temperature-gradient loading to bridge objects.
Line and area springs	This test problem demonstrates and validates the application of line and area springs.
Insertion point and transform stiffness	3D demonstration of insertion-point, end-offset, and transform-stiffness application.
Body vs. equal constraint	Comparison between body-constraint and equal-constraint application to a simply supported beam.
End offsets	Demonstration of end offsets applied to a two-span continuous beam.
Frame to shell connections	This tutorial describes the application of connections between frame and shell elements.
Saving section cuts during moving-load analysis	Sections cuts may be saved during moving-load analysis through this procedure.
Section cuts drawn within the graphical user interface	Draw section cuts within the graphical user interface using either 2D or 3D views.
P-Delta effect for a cantilevered column	Calculation and verification of the P-Delta effects of a cantilevered column.
Human-induced vibrations	The modeling and analysis of human-induced vibrations due to footfalls or another type of impact.
Frame and shell section cuts	Section cuts are defined through a simply-supported beam which is modeled using frame and shell objects.
Interpreting buckling analysis results for different initial conditions	Buckling analysis may begin with either zero initial conditions or the stiffness taken from the end of a nonlinear load case. This test problem compares the associated output.
Multi-pendulum model (Newton's cradle)	Model a pendulum system in SAP2000 using large-displacement time-history analysis.
Hinge response when yield point changes	Behavior of a concentrated plastic hinge when the loading applied to a nonlinear frame object causes the yield point of the interaction surface to change position.
Staged construction in buildings	Guidelines for setting up staged construction and interpreting the staged-construction results.
Vehicle remains fully in lane	Verification of moving-load analysis when the option is specified for a vehicle to remain fully in lane.
Temperature load vs. insertion point	Given temperature loading applied to a fixed-fixed beam with variable insertion point (centroid and top-center), theoretical solution is compared to that from a SAP2000 model.
Partial end releases	Hand calculations present the following SAP2000 features: fixed conditions, full releases, partial releases, rotational-spring supports, and panel zones.
Options for applying area loads	Uniform (Shell), one-way Uniform to Frame (Shell), and two-way Uniform to Frame (Shell) load application to shell objects and associated meshing procedures.
Influence surface	Influence-surface verification for a cantilever beam modeled using shell objects.

Moment curvature, cracked moment of inertia and Caltrans idealized model	Parameters and output for moment curvature and cracked moment of inertia.
Steady-state vs. time-history analysis	Test problems to demonstrate the differences and similarities between steady-state and time-history analyses.