

# Home

This is the home page for the Test Problems space that contains tests problems for all CSI programs, usually with the relevant model attached. Test problems are used to demonstrate certain features of the program or results obtained from the program without necessarily providing detailed instructions on how to build the model.

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## Browse test problems by program

## View table with all test problems

### Tips

- You may click on the table heading in the table below to sort by a particular column (default sorting is by title).
- Model ID uniquely identifies each model. "na" indicates that no model accompanies the test problem.

Model ID	Title	Description	Program	Version
na	<a href="#">Acceleration loading</a>	Demonstrate acceleration loading and validate relative/absolute acceleration, velocity, and displacement.	SAP2000	12.0.1
na	<a href="#">Align solid and hollow sections</a>	Model relative positive position for frame sections which have identical outlines, but different center-of-gravity locations due to one section being hollow.	SAP2000	14.2.0
na	<a href="#">Body vs. equal constraint</a>	Comparison between body-constraint and equal-constraint application to a simply supported beam.	SAP2000	11.0.8
1402	<a href="#">Bridge shrinkage example</a>	Evaluate shrinkage for a one-span and a continuous two-span bridge system.	CSiBridge	18.1.1
96	<a href="#">Effect of insertion point on beam reactions</a>	How insertion point affects horizontal reactions and flexural response of a simply supported beam.	SAP2000	14.2.3
na	<a href="#">End offsets</a>	Demonstration of end offsets applied to a two-span continuous beam.	SAP2000	
591	<a href="#">Frame and shell section cuts</a>	Section cuts are defined through a simply-supported beam which is modeled using frame and shell objects.	SAP2000	18.0.1+
na	<a href="#">Frame to shell connections</a>	This tutorial describes the application of connections between frame and shell elements.	SAP2000	12.0.0
na	<a href="#">Hinge response when yield point changes</a>	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.	SAP2000	14.2.0
577	<a href="#">Horizontal moving loads</a>	Demonstration of horizontal moving loads	CSiBridge	17.2.0+
na	<a href="#">Human-induced vibrations</a>	The modeling and analysis of human-induced vibrations due to footfalls or another type of impact.	SAP2000	14.1.0
70	<a href="#">Hyperstatic forces for bridge-object superstructures</a>	The hyperstatic forces within a superstructure which is modeled using bridge objects may be obtained using any of three methods described in this test problem.	CSiBridge	15.1.1
na	<a href="#">Influence surface</a>	Influence-surface verification for a cantilever beam modeled using shell objects.	SAP2000	
94	<a href="#">Insertion point and transform stiffness</a>	3D demonstration of insertion-point, end-offset, and transform-stiffness application.	SAP2000	12.0.1
589	<a href="#">Internal (eigen) stresses resulting from non-uniform temperature gradient loading</a>	Illustration of how CSiBridge can be used to evaluate internal stresses resulting from non-uniform temperature gradient loading.	CSiBridge	17.3.0
511	<a href="#">Interpreting buckling analysis results for different initial conditions</a>	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.	SAP2000	15.1.0
na	<a href="#">Line and area springs</a>	This test problem demonstrates and validates the application of line and area springs.	SAP2000	12.0.0
na	<a href="#">Modeling segmental-bridge joint openings</a>	The modeling and response of joint openings, simulated using gap link elements, between shell segments of a post-tensioned bridge deck.	CSiBridge	
140	<a href="#">Moment curvature, cracked moment of inertia and Caltrans idealized model</a>	Parameters and output for moment curvature and cracked moment of inertia.	SAP2000	15+
na	<a href="#">Moving-load analysis section cuts</a>	Verification of section-cut forces generated during moving-load analysis.	SAP2000	11.0.8

516	<a href="#">Multi-pendulum model (Newton's cradle)</a>	Model a pendulum system in SAP2000 using large-displacement time-history analysis.	SAP2000	15.1.0
na	<a href="#">Options for applying area loads</a>	Uniform (Shell), one-way Uniform to Frame (Shell), and two-way Uniform to Frame (Shell) load application to shell objects and associated meshing procedures.	SAP2000	14.2.2
109	<a href="#">P-Delta effect for a cantilevered column</a>	Calculation and verification of the P-Delta effects of a cantilevered column.	SAP2000	14.2.4
na	<a href="#">Partial end releases</a>	Hand calculations present the following SAP2000 features: fixed conditions, full releases, partial releases, rotational-spring supports, and panel zones.	SAP2000	14.2.4
na	<a href="#">Saving section cuts during moving-load analysis</a>	Sections cuts may be saved during moving-load analysis through this procedure.	SAP2000	14.1.0
na	<a href="#">Section cuts drawn within the graphical user interface</a>	Draw section cuts within the graphical user interface using either 2D or 3D views.	SAP2000	14.1.0
na	<a href="#">Staged construction in buildings</a>	Guidelines for setting up staged construction and interpreting the staged-construction results.	SAP2000	14 and above
594	<a href="#">Staged construction of a five-story column</a>	Creep application, addition of nodes to deformed configuration, and verification against manual calculations are given for the staged construction of a five-story column.	SAP2000	18.0.1
1407	<a href="#">Staged-construction analysis of two-span precast-girder bridge</a>	Modeling and construction stage analysis of precast-girder bridge which is simply supported for dead load and continuous for live load.	CSiBridge	18.1.1
na	<a href="#">Start and end station for bridge line-load input</a>	This test problem explains start- and end-station interpretation for line load offset from baseline.	CSiBridge	15.1.0
85	<a href="#">Steady-state vs. time-history analysis</a>	Test problems to demonstrate the differences and similarities between steady-state and time-history analyses.	SAP2000	14.2.2
na	<a href="#">Temperature load vs. insertion point</a>	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.	SAP2000	14.2.3
97	<a href="#">Temperature-gradient loading for bridge objects</a>	This test problem demonstrates CSI Software calculation and application of temperature-gradient loading to bridge objects.	SAP2000	14.0.0
na	<a href="#">Tendon force vs. frame response</a>	Tendon application is validated by comparing tendon forces to those in an equivalent frame system.	SAP2000	12.0.2
130	<a href="#">Two-span girder simply-supported for DL and continuous for LL</a>	Modeling demonstration for a two-span girder which is simply-supported for DL and continuous for LL.	SAP2000	12.0.1
na	<a href="#">Vehicle remains fully in lane</a>	Verification of moving-load analysis when the option is specified for a vehicle to remain fully in lane.	SAP2000	