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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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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	Acceleration loading	Demonstrate acceleration loading and validate relative/absolute acceleration, velocity, and displacement.	SAP2000	12.0.1
na	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.	SAP2000	14.2.0
na	Body vs. equal constraint	Comparison between body-constraint and equal-constraint application to a simply supported beam.	SAP2000	11.0.8
1402	Bridge shrinkage example	Evaluate shrinkage for a one-span and a continuous two-span bridge system.	CSiBridge	18.1.1
96	Effect of insertion point on beam reactions	How insertion point affects horizontal reactions and flexural response of a simply supported beam.	SAP2000	14.2.3
na	End offsets	Demonstration of end offsets applied to a two-span continuous beam.	SAP2000	

591	Frame and shell section cuts	Section cuts are defined through a simply-supported beam which is modeled using frame and shell objects.	SAP2000	18.0.1+
na	Frame to shell connections	This tutorial describes the application of connections between frame and shell elements.	SAP2000	12.0.0
na	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.	SAP2000	14.2.0
577	Horizontal moving loads	Demonstration of horizontal moving loads compared against hand calculated results.	CSiBridge	17.2.0+
na	Human-induced vibrations	The modeling and analysis of human-induced vibrations due to footfalls or another type of impact.	SAP2000	14.1.0
70	Hyperstatic forces for bridge-object superstructures	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	Influence surface	Influence-surface verification for a cantilever beam modeled using shell objects.	SAP2000	
94	Insertion point and transform stiffness	3D demonstration of insertion-point, end-offset, and transform-stiffness application.	SAP2000	12.0.1
511	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.	SAP2000	15.1.0

na	Line and area springs	This test problem demonstrates and validates the application of line and area springs.	SAP2000	12.0.0
na	Modeling segmental-bridge joint openings	The modeling and response of joint openings, simulated using gap link elements, between shell segments of a post-tensioned bridge deck.	CSiBridge	
140	Moment curvature, cracked moment of inertia and Caltrans idealized model	Parameters and output for moment curvature and cracked moment of inertia.	SAP2000	15+
na	Moving-load analysis section cuts	Verification of section-cut forces generated during moving-load analysis.	SAP2000	11.0.8
516	Multi-pendulum model (Newton's cradle)	Model a pendulum system in SAP2000 using large-displacement time-history analysis.	SAP2000	15.1.0
na	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.	SAP2000	14.2.2
109	P-Delta effect for a cantilevered column	Calculation and verification of the P-Delta effects of a cantilevered column.	SAP2000	14.2.4
na	Partial end releases	Hand calculations present the following SAP2000 features: fixed conditions, full releases, partial releases, rotational-spring supports, and panel zones.	SAP2000	14.2.4
na	Saving section cuts during moving-load analysis	Sections cuts may be saved during moving-load analysis through this procedure.	SAP2000	14.1.0
na	Section cuts drawn within the graphical user interface	Draw section cuts within the graphical user interface using either 2D or 3D views.	SAP2000	14.1.0
na	Staged construction in buildings	Guidelines for setting up staged construction and interpreting the staged-construction results.	SAP2000	14 and above

594	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.	SAP2000	18.0.1
1407	Staged-construction analysis of two-span precast-girder bridge	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	Start and end station for bridge line-load input	This test problem explains start- and end-station interpretation for line load offset from baseline.	CSiBridge	15.1.0
85	Steady-state vs. time-history analysis	Test problems to demonstrate the differences and similarities between steady-state and time-history analyses.	SAP2000	14.2.2
na	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.	SAP2000	14.2.3
97	Temperature-gradient loading for bridge objects	This test problem demonstrates CSI Software calculation and application of temperature-gradient loading to bridge objects.	SAP2000	14.0.0
na	Tendon force vs. frame response	Tendon application is validated by comparing tendon forces to those in an equivalent frame system.	SAP2000	12.0.2
130	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.	SAP2000	12.0.1

na	Vehicle remains fully in lane	Verification of moving-load analysis when the option is specified for a vehicle to remain fully in lane.	SAP2000	
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