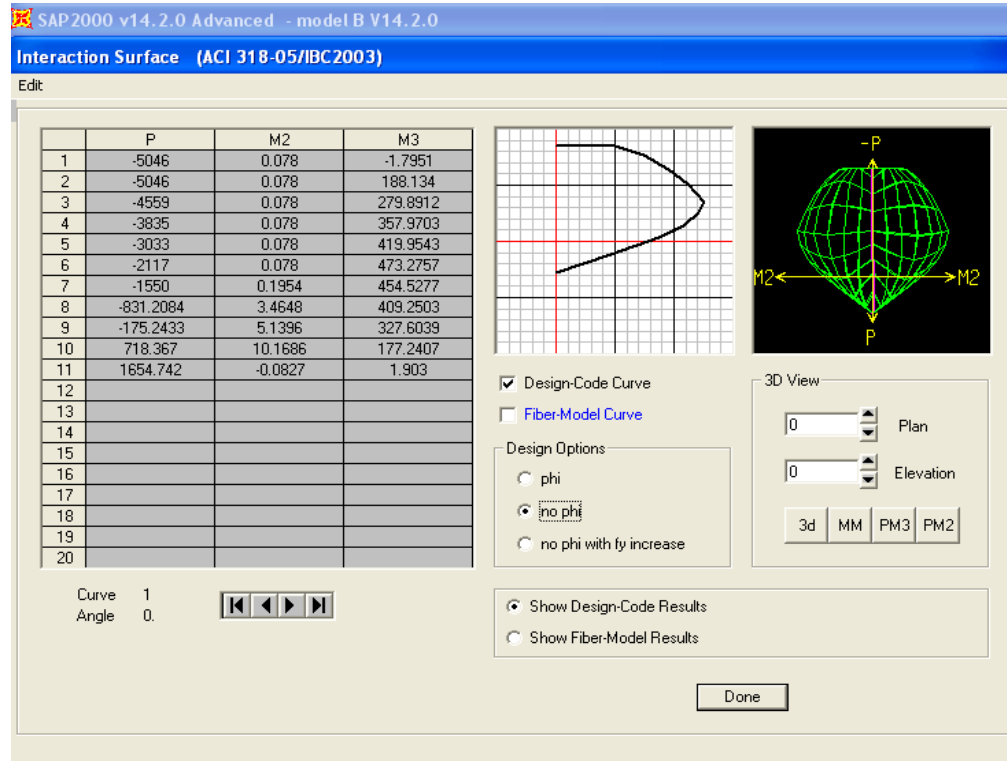


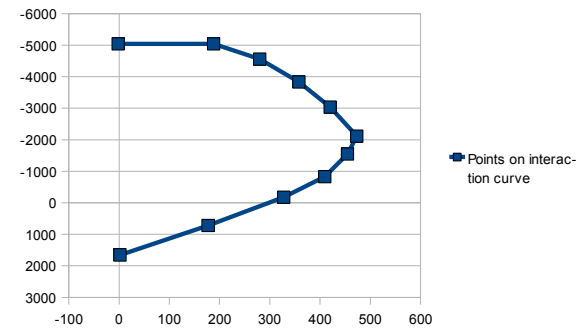
Compare hinge response curve with hinge backbone curve when the point on the interaction surface changes.

Interaction curve for the cross-section calculated by the section designer:



Points on interaction curve

| P | M3 |
|----|----------------|
| 1 | -5046 -1.8 |
| 2 | -5046 188.13 |
| 3 | -4559 279.89 |
| 4 | -3835 357.97 |
| 5 | -3033 419.95 |
| 6 | -2117 473.28 |
| 7 | -1550 454.53 |
| 8 | -831.21 409.25 |
| 9 | -175.24 327.6 |
| 10 | 718.37 177.24 |
| 11 | 1654.74 1.9 |



Interaction curve specified in the hinge definition is based on the above interaction curve calculated by section designer:

SAP 2000 v14.2.0 Advanced - model B V14.2.0

P-M3 Interaction Curve Definition for P-M3

Edit

User Interaction Curve Options

☒ Interaction Curve Is Symmetric

Number of Curves:

Number of Points on Each Curve:

Scale Factors (Same for All Curves)


KN, m, C:

First and Last Points (Same for All Curves)

| Point | P | M3 |
|-------|--------|----|
| 1 | -5046. | 0 |
| 11 | 1654. | 0 |

Interaction Curve Requirements - With Symmetry

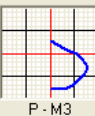
- Only one P-M3 curve is specified.
- P (tension positive) increases monotonically.
- M3 = 0 at the first and last points.
- All M3 > 0 (except at first and last points).
- The curve must be convex (no dimples in surface).



Interaction Curve Data

Current Curve:

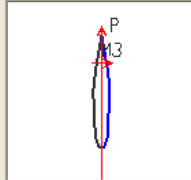
| Point | P | M3 |
|-------|--------|------|
| 1 | -5046. | 0. |
| 2 | -5045. | 188. |
| 3 | -4559. | 279. |
| 4 | -3835. | 357. |
| 5 | -3033. | 419. |
| 6 | -2117. | 473. |
| 7 | -1550. | 454. |
| 8 | -831. | 409. |
| 9 | -175. | 327. |
| 10 | 718. | 177. |
| 11 | 1654. | 0. |



P - M3

Plot of Full Interaction Curve

☒ Highlight Current Curve



P:

M3:

Definition of hinge moment rotation curve (the curve is the same for all levels of axial force):

SAP 2000 v14.2.0 Advanced - model B V14.2.0

Moment Rotation Data for P-M3 - Interacting P-M3

Edit

Select Curve

Axial Force: -4000. Angle: 90. Curve #1: [Navigation Buttons]

Units: KN, m, C

| Point | Moment | Rotation/SF |
|-------|--------|-------------|
| A | 0. | 0. |
| B | 1000. | 0. |
| C | 1. | 0.01 |
| D | 1. | 0.02 |
| E | 1. | 0.03 |

Note: Yield moment is defined by interaction curve

Copy Curve Data Paste Curve Data

Acceptance Criteria (Plastic Deformation / SF)

Immediate Occupancy: 3.000E-03

Life Safety: 0.012

Collapse Prevention: 0.015

☐ Show Acceptance Points on Current Curve

3D View

Plan: 0 Elevation: 0 Aperture: 0

Axial Force: -4000

☐ Hide Backbone Lines
☐ Show Acceptance Criteria
☐ Show Thickened Lines
☒ Highlight Current Curve

3D RR MR3 MR2

Moment Rotation Information

Symmetry Condition: Symmetric

Number of Axial Force Values: 6

Number of Angles: 1

Total Number of Curves: 6

Angle Is Moment About

0 degrees = About Positive M2 Axis

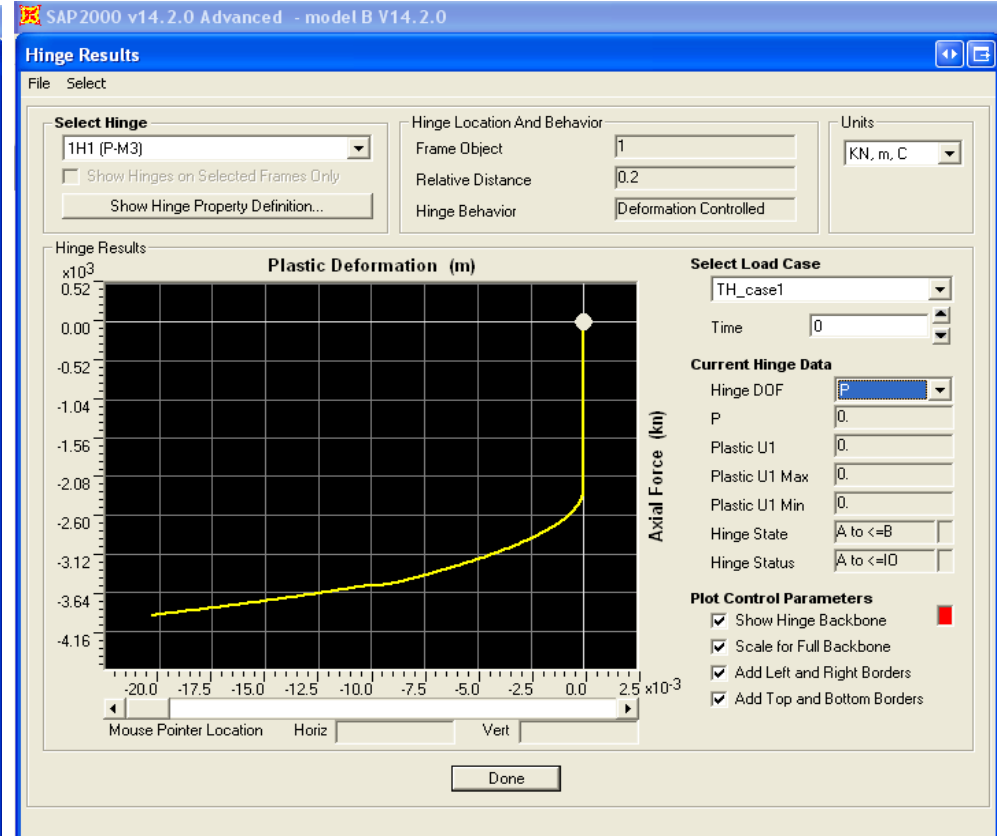
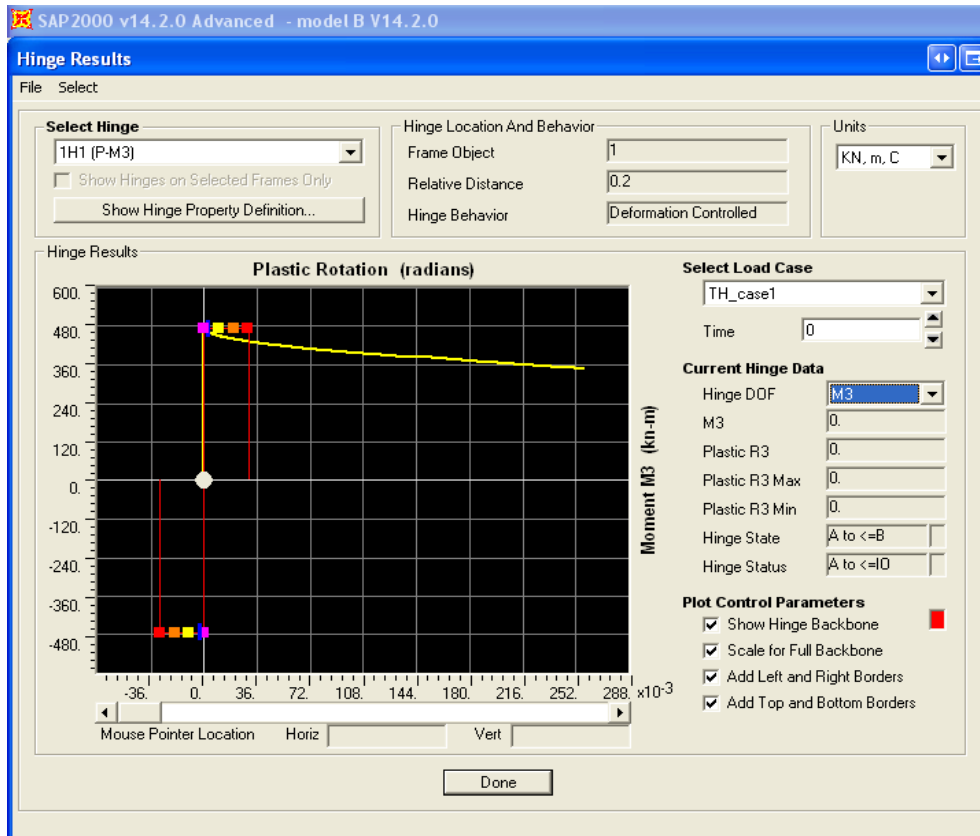
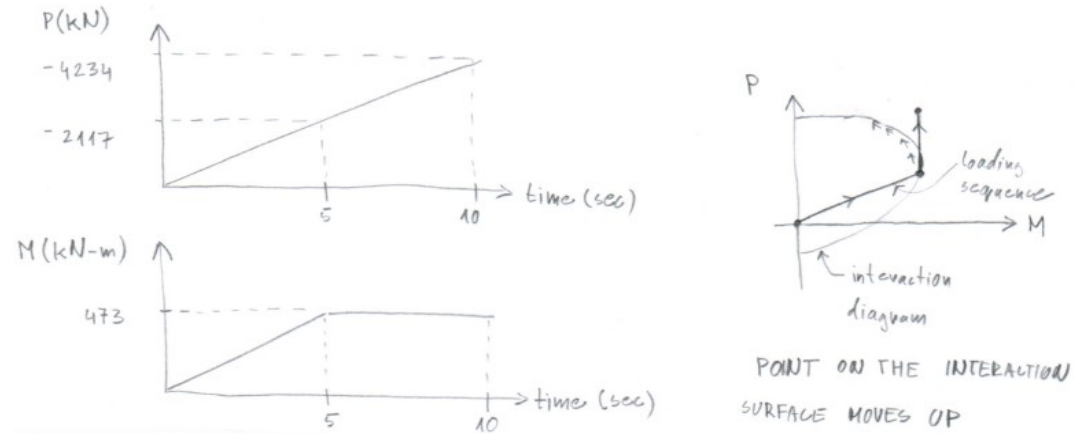
90 degrees = About Positive M3 Axis

180 degrees = About Negative M2 Axis

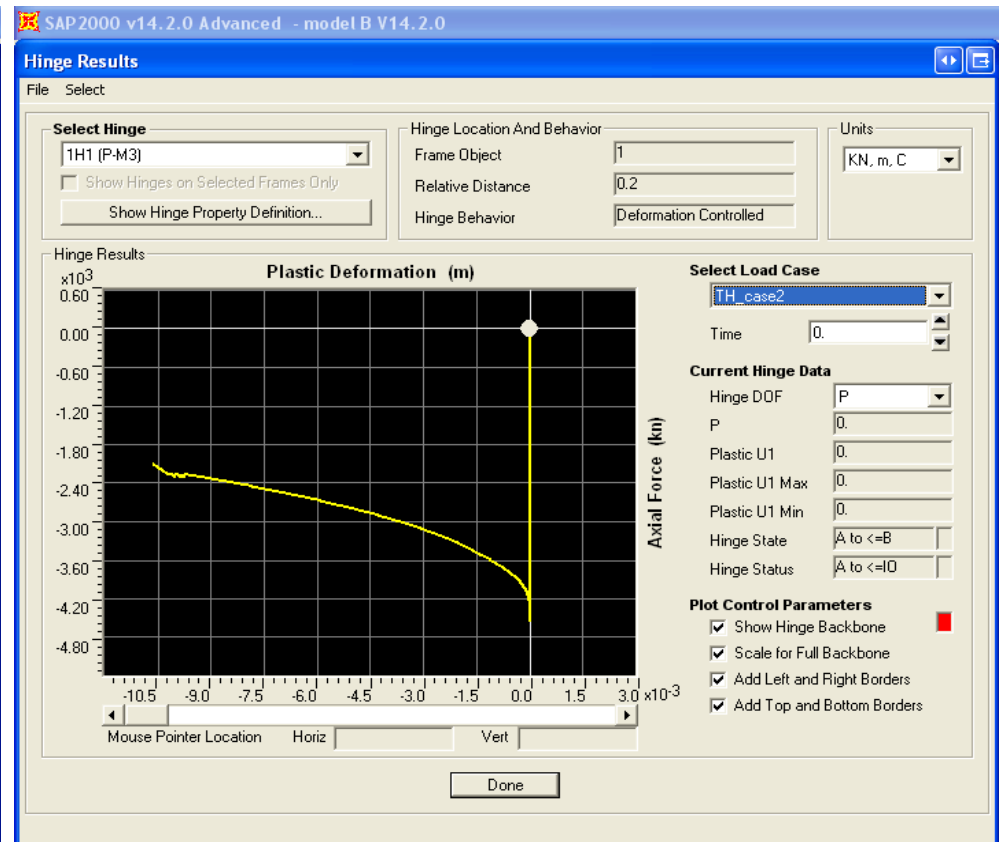
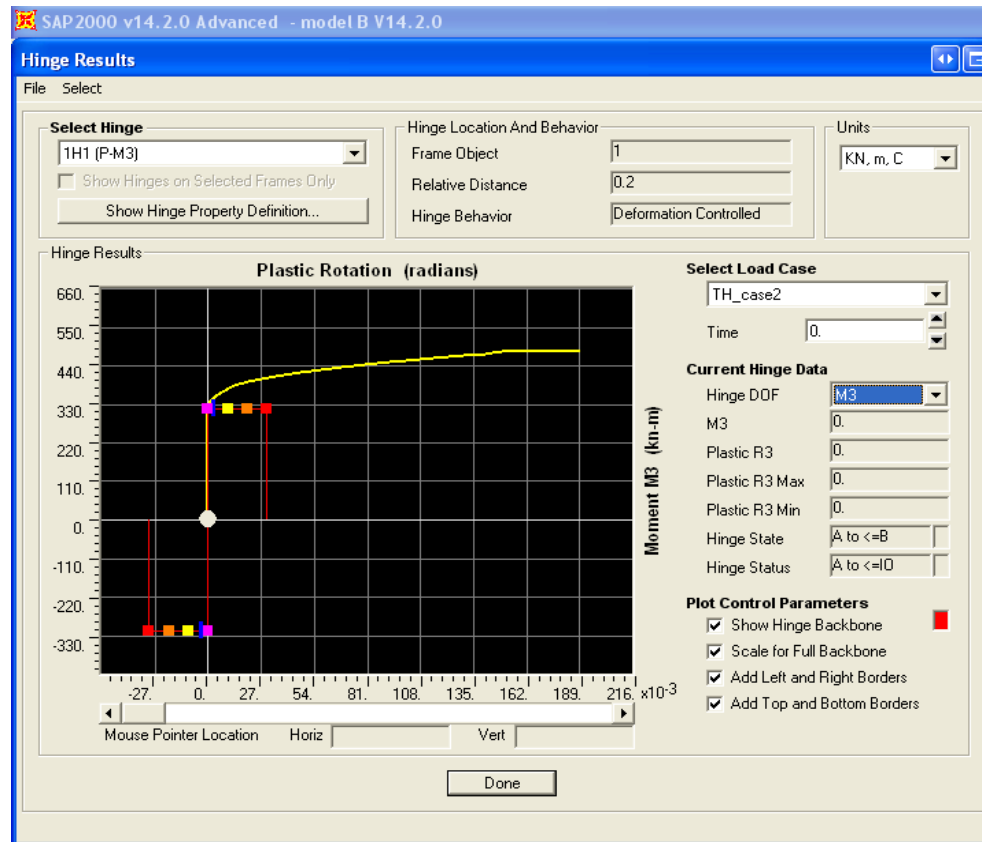
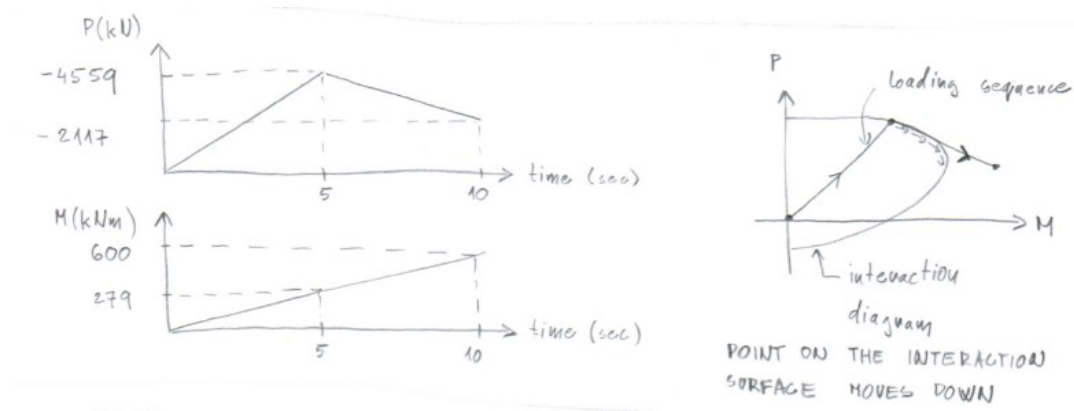
270 degrees = About Negative M3 Axis

OK Cancel

Loading sequence and response for case 1



Loading sequence and response for case 2



Loading sequence and response for case 3

