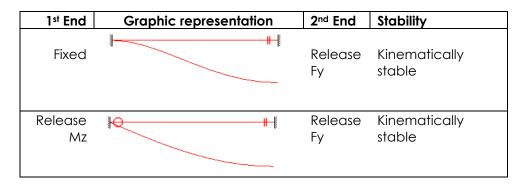


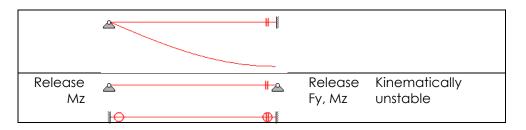
nber Attributes		
Concrete	Wood Tower	
General Offsets Deflections	Bridge Steel Composite Aluminum	
ID: M39 Phys: 32	2 Change Solid Display Color	
Name:	Default 🗸	
	Properties	
🗹 Change Section Shape: 🛛 🚺	W310x39	
7 - W310x39 - [STEEL]	/	
Change Member Type:		
Generic		
Change Analysis Parameters:		
Normal	▲ 5.8	
Change Physical Member Validation:		
Strict	105 - +	
Properties Modification (Analysis)	End Releases	
Area for Self Weight	Release in Fx At Joint I	
Area for Stiffness 1	✓ Release in Fy None ✓	
	Release in Fz None	
Veak Axis Inertia	Release in Mx None	
Torsional Modulus		
	My (I) Partial (Ratio) V 0	
	Mz (I) Partial (Rigidity) 🗸 0 kN-m/rad	
	🗹 My (J) Total/Hinged 🗸	
	V Mz (J) Total/Hinged V	
	Geometry	
Length (MembPhys.) (7000) - (
Weight (MembPhys.) (271.453		<u>0</u> K
		Cancel
Change Sect. Rotation: 0	deg $\beta = 0.0 \text{ deg}$ Joint J: 20	Help

SAFI allows specifying member end releases on all six degrees of freedom.

It is possible to define translational releases and torsional releases at either end of the member (but not both ends). Select the appropriate option in the list (*None*, *At Joint I* or *At Joint J*).

Although the available options prevent most unstable situations, there are still some combinations that lead to instabilities.



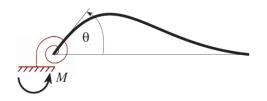


In addition, it is not allowed to have partial flexural fixities along with Fx, Fy, Fz or Mx releases.

Partial fixities may be defined either by a rigidity ratio or directly by the rotational stiffness of the connection. Bending releases at member ends may be defined by simply clicking one of the buttons shown below.

Concrete	Wood Tower
General Offsets Deflections	Bridge Steel Composite Aluminum
ID: M39 Phys: 3	2 Change Solid Display Color
Name:	Default
	Properties
Change Section Shape:	
7 · W310x39 · [STEEL]	* <u>* </u> *
Change Member Type:	
Generic	
Change Analysis Parameters:	
Normal	- 5.8
Change Physical Member Validation:	
Strict	
 Properties Modification (Analysis) 	End Releases
Area for Self Weight	Release in Fx At Joint I
Area for Stiffness 1	Release in Fy None
Strong Axis Inertia 1	Release in Fz None
Weak Axis Inertia	Release in Mx None
Torsional Modulus	
	V My (I) Partial (Ratio) V 0
	Mz (I) Partial (Rigidity) 🗸 0 kN-m/rad
	V My (J) Total/Hinged V
	🗹 Mz (J) Total/Hinged 🔽
	Geometry
Length (MembPhys.) (7000) -	

The fixed end moment at a joint having a given rotational rigidity (k) follows the following relation: $M = k \cdot \theta$, where θ is the rotation of the joint. When the rigidity k = 0 the member end is hinged. When the rigidity $k = \infty$, the member end is fixed.



There is a direct relation between rotational rigidity (k) and the ratio of transferred moment (\Box).

$$k = \frac{3 \cdot EI}{L} \frac{\gamma}{1 - \gamma}$$

Where *El* Elastic modulus times the inertia of the member.

- L Length of the member.
 - Ratio of transferred moments between 0 and 1
 - *k* Rotational rigidity (in units of moment per radian)

When the rigidity ratio $\Box = 0$ (k = 0) the member is hinged. When the rigidity ratio $\Box = 1$ ($k = \infty$), the member is fixed. Note that if a member is subdivided, it will have the effect of increasing the rigidity (k) as the member length L is decreased.

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