

Atir Software Development LTD

STRAP - Cable element

Verification

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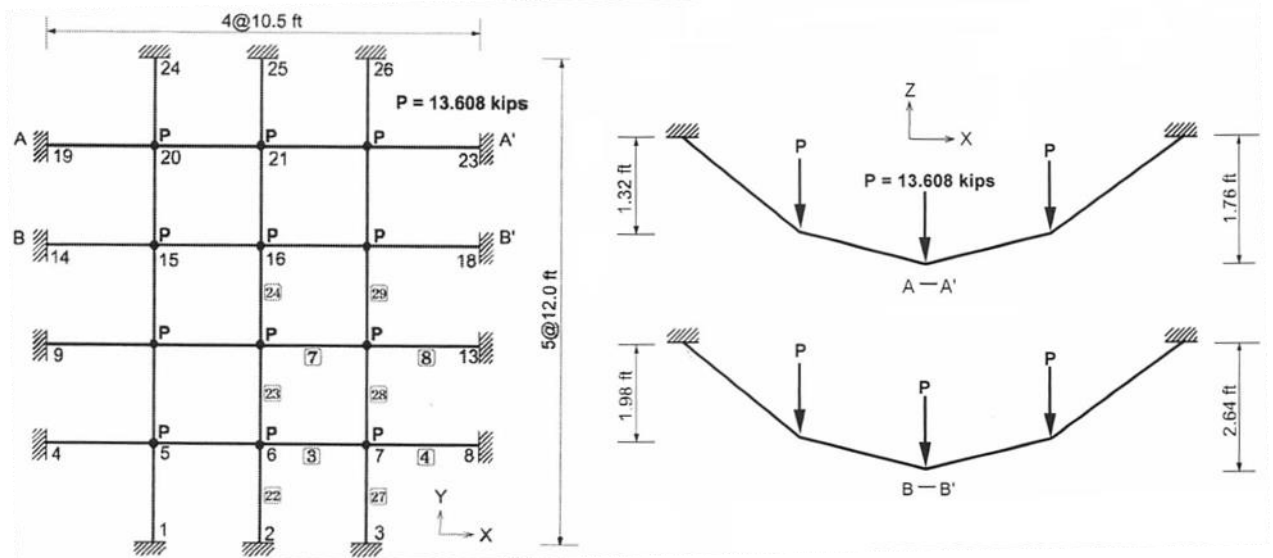
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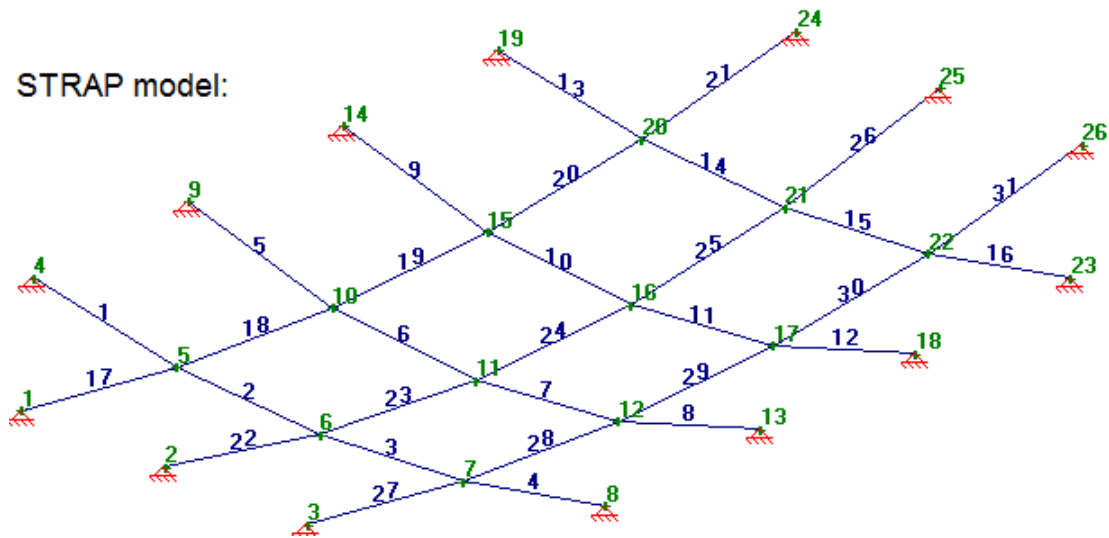
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1. Description

A cable net structure is subject to vertical loads applied at its interior nodes:



STRAP model:



2. Geometry

Cable area: 0.01 [ft²]

Modulus of elasticity: 3.6x10⁶ [ksf]; Poisson's ratio: 0.0

Supports: exterior nodes: all DOFs fixed

3. Loads

as shown above

4. Reference

"Midas" Verification manual. The manual presents results from three references:

1. John W. Leonard, *Tension Structures 1988*, pp115-7, McGraw Hill book company.
2. A. Lo, *Nonlinear dynamic analysis of cable and membrane structures, 1981*, Ph.D. Dissertation, Oregon State University.
3. Baron & Vendatesan, *Nonlinear Analysis of cable and truss structures, ASCE, Vol 97, pp. 679-710, 1971*, Journal of the structural Division.

5. Comparison of Results

Beam/Node	Result type	Result				Deviation
		Theoretical			STRAP	
		Ref.1	Ref.2	Ref.3		
Node 21	Deflection - Z	-0.351	-0.351	-0.352	-0.352	-
Node 21	Deflection - Y	0.0366	0.0366	0.0367	0.0367	-
Beam 8	Axial	80.0	80.0	80.0	80.1	0.13%
Beam 24	Axial	57.9	57.9	57.8	57.9	-