

Atir Software Development LTD

STRAP - Pipe grid

Verification

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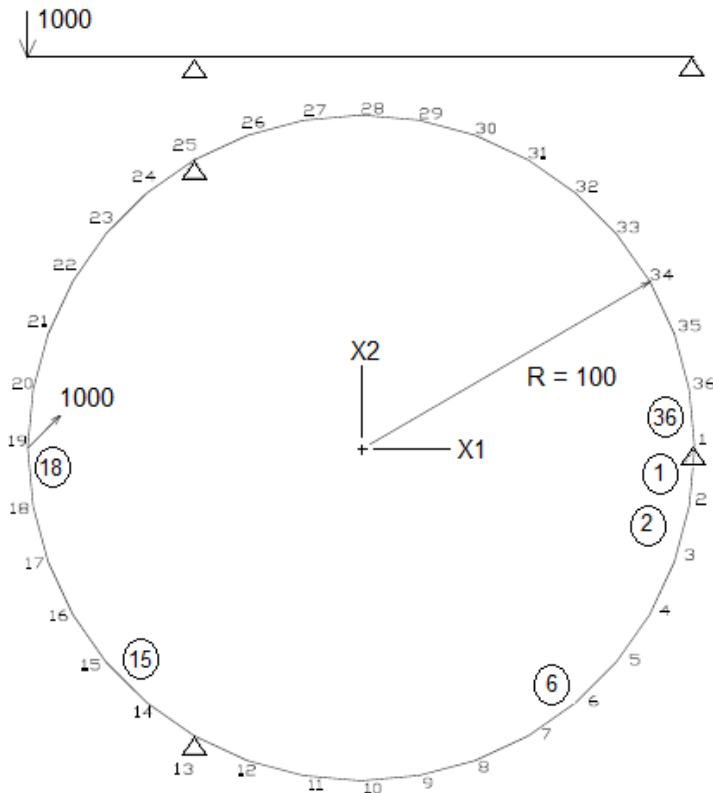
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1. Description

A grid in the form of a circular ring beam rests on three equally spaced simple supports. A concentrated load is applied midway between two of the supports.



2. Geometry

Radius: 100 in.

Elements: 36 identical beams

Property: Round bar, diam = 2.7 in.

Material: $E = 107 \text{ lb/in}^2$; Poisson ratio = 0.3

Supports: 3 equally spaced pinned supports (X3)

3. Loads

Concentrated load: 1000 lb (X3 direction)

4. Reference

Raymond J Roark, *Roark's Formulas for Stress and Strain, Fourth Edition. (Table XIX - Case 3)*, 1965 4th edition, McGraw – Hill book company.

5. Calculation

The STRAP model consists of 36 straight beam segments, i.e. the model is not continuously circular. This leads to the slight discrepancy in the results.

6. Comparison of Results

Beam	Result type	Result		Deviation
		Theoretical	STRAP	
18	M2 moment	38490	38344	0.38%
1	M2 moment	19250	19172	0.41%
6	MT moment	-8790	-8721	0.78%
15	MT moment	13100	13225	0.95%