Atir Software Development LTD

STRAP - Composite beam

Verification

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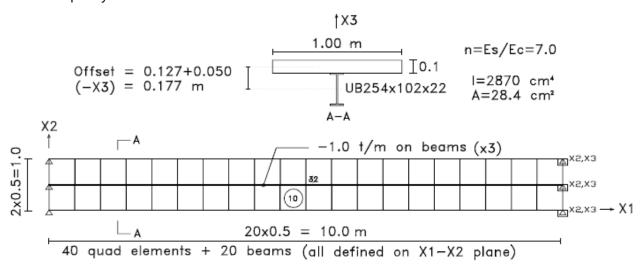
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1. Description

A simply supported composite beam - steel section and concrete slab - loaded with a uniformly distributed load.

All beams and elements in this space model are defined on the X1-X2 global plane. Beam offsets are used to place the steel section below the slab, thereby generating the increased moment-of-inertia of the composite section. Note that the structure must be defined as a space model in order to specify X3 offsets.

2. Geometry

Modulus of Elasticity: Concrete: 300,000 t/m2   Steel: 2,100,000 t/m2

3. Loads

Beam load: FX3 = -1.0 t/m on all beams (total load = 10 t)

4. Reference

Warren C. Young, *Roark's Formulas for Stress and Strain, Sixth Edition. (Table 3 - Case 2c), 1989 6th edition*, McGraw – Hill book company.

5. Comparison of Results

Location	Result type	Result			Deviation
		Theoretical	STRAP	STRAP (no offset)	
Node 32	Deflection	0.054 m	0.0548	(0.153)	1.5%
Element 10	Neutral axis	79.3 mm	79.0*	-	0.38%

* The neutral axis location is calculated from the interpolation of +SX and -SX values.