RC Beam Design to Eurocode 2

.

Input data

Beam and cross section dimensions

Beam length -

Cross section dimensions: height - , width -

Loads

Uniformly distributed load - (total, factored)

Materials

Concrete

Characteristic compressive cylinder strength -

Partial safety factor for concrete - ,

Design compressive cylinder strength -

Factor for effective compression zone depth -

Effective compressive strength factor -

Ultimate compressive strain -

Mean value of axial tensile strength -

Steel

Longitudinal reinforcement

Characteristic yield strength -

Partial safety factor for steel -

Design yield strength -

Modulus of elasticity -

Shear reinforcementCharacteristic yield strength -

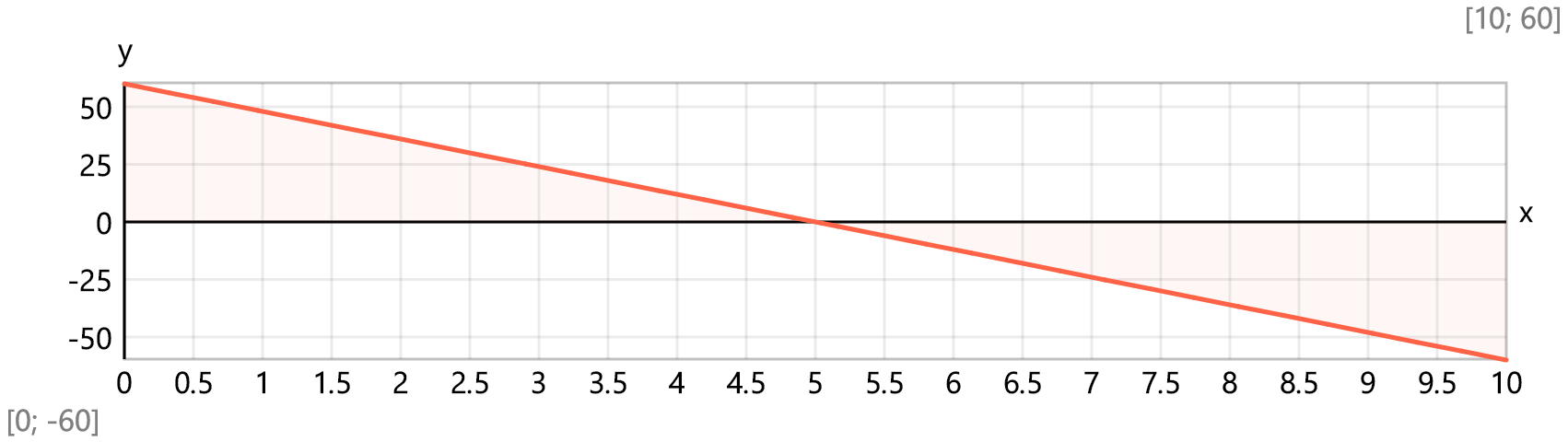
Design yield strength -

Results

Internal forces

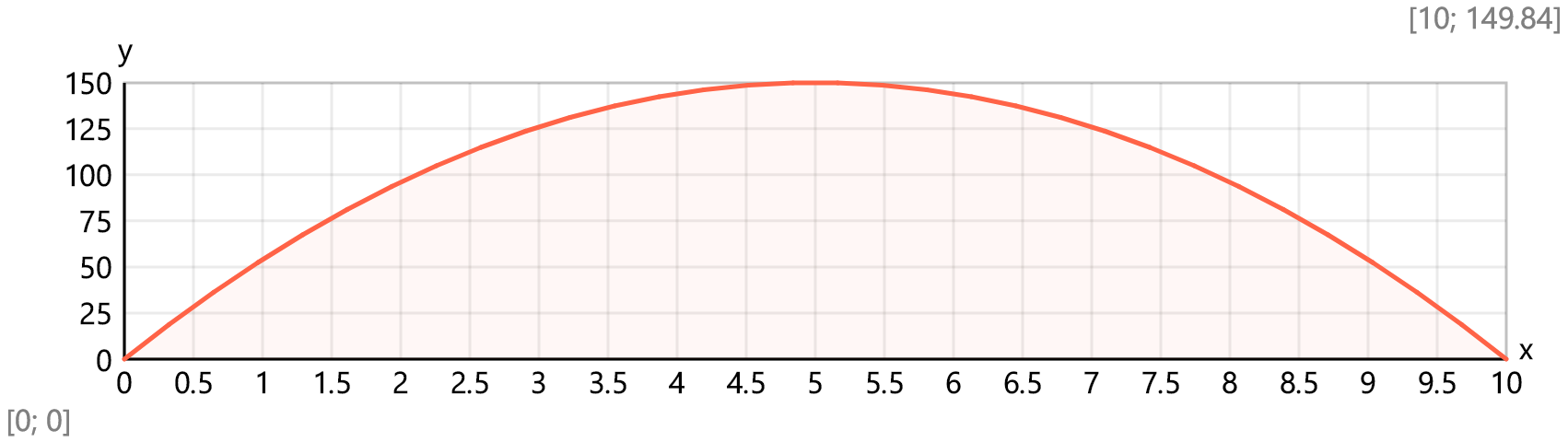
Support reaction -

Shear force diagram -



Design shear force -

Bending moment diagram -



Design bending moment -

Bending design

Concrete cover to the center of reinforcement -

Effective cross section depth - cm

Relative design bending moment -

Compressive zone depth -

Relative compression zone depth -

Design reinforcement yield strain -

Relative depth of compression zone at yielding of bottom reinforcement

Limit compression zone depth -

(*ξ*lim = *ξ*yd for elastic and *ξ*lim = 0.45 for plastic analysis)

≤ - Compressive reinforcement is **NOT** required.

Lever arm of internal forces -

Required main reinforcement -

Selected bars with size

Provided main reinforcement

Reinforcement ratio -

Minimum reinforcement ratio

<

Maximum reinforcement ratio - >

Shear design

Shear capacity without reinforcement

, , ,

Minimum shear resistance

Design check:

≤ . Shear reinforcement is **NOT** required by calculations!

Nominal reinforcement will be provided as follows:

Shear links with legs and diameter -

Area of one leg -

Maximum stirrup spacing -

Provided stirrup spacing -

Provided shear reinforcement area - /m

Reinforcement ratio -

<