

Resistance of I-joist Cantilevers for Vertical Building Offset

Design Criteria

Cantilever length:	From I-joist depth to 2 feet
Reinforcement on one side:	2-1/2-inch nails at 6 inches on centre
Reinforcement on both sides:	2-1/2-inch nails at 6 inches on centre offset by 3 inches on the opposite side
Reinforcement type:	Wood structural panel with a minimum thickness of 23/32 inch (for OSB, panel mark 48/24)
Reinforcement back span:	2 feet minimum

Design Properties

Joist depth	Joist series	Unreinforced I-joist		I-joist reinforced on one side		I-joist reinforced on both sides	
		$V_r^{(a)}$ (lbf)	$IR_r^{(b)}$ (lbf)	$V_r^{(c)}$ (lbf)	$IR_r^{(d)}$ (lbf)	$V_r^{(c)}$ (lbf)	$IR_r^{(d)}$ (lbf)
9-1/2"	NI-20	1,770	4,060	2,080	5,160	2,400	6,250
	NI-40x	1,890	4,150	2,200	5,270	2,520	6,390
	NI-60	1,890	4,160	2,200	5,280	2,520	6,410
	NI-80	1,890	4,240	2,200	5,060	2,520	5,880
11-7/8"	NI-20	2,240	5,070	2,730	6,440	3,220	7,810
	NI-40x	2,340	5,590	2,830	7,100	3,320	8,610
	NI-60	2,340	5,600	2,830	7,110	3,320	8,630
	NI-80	2,340	5,790	2,830	6,910	3,320	8,030
	NI-90	3,040	5,790	3,530	6,910	4,020	8,030
14"	NI-40x	2,730	5,570	3,410	7,080	4,090	8,580
	NI-60	2,730	5,590	3,410	7,100	4,090	8,610
	NI-80	2,730	6,030	3,410	7,190	4,090	8,360
	NI-90	3,350	6,030	4,030	7,190	4,710	8,360
16"	NI-60	3,110	5,570	3,820	7,080	4,530	8,580
	NI-80	3,110	6,250	3,820	7,460	4,530	8,660
	NI-90	3,680	6,250	4,390	7,460	5,100	8,660

- a) Factored shear resistance, V_r , of the unreinforced I-joist.
- b) Factored intermediate reaction resistance, IR_r , of the unreinforced I-joist without bearing stiffeners. Minimum bearing length shall be 5-1/2 inches for bearings adjacent to cantilever.
- c) Factored shear resistance, V_r , of the reinforced I-joist.
- d) Factored intermediate reaction resistance, IR_r , of the reinforced I-joist without bearing stiffeners. Minimum bearing length shall be 5-1/2 inches for bearings adjacent to cantilever.

Notes:

- The tabulated design values are for standard-term duration of load ($K_D = 1.0$).
- Nordic I-joists are listed in CCMC Evaluation Report 13032-R and APA Product Report PR-L274C.
- Design of I-joists shall be in accordance with CSA O86.
- All nails are assumed to be common nails unless otherwise noted. Nails shall have a diameter not less than 0.128 inch for 2-1/2-inch nails.

Design Criteria

Cantilever length:	Up to the I-joist depth
Reinforcement on one side:	2-1/2-inch nails at 6 inches on centre
Reinforcement on both sides:	2-1/2-inch nails at 6 inches on centre offset by 3 inches on the opposite side
Reinforcement type:	Wood structural panel with a minimum thickness of 23/32 inch (for OSB, panel mark 48/24)
Reinforcement back span:	2 feet minimum

Design Properties

Joist depth	Joist series	Unreinforced I-joist		I-joist reinforced on one side		I-joist reinforced on both sides	
		5-1/2" Bearing		5-1/2" Bearing		5-1/2" Bearing	
		$V_r^{(a)}$ (lbf)	$ER_r^{(b)}$ (lbf)	$V_r^{(c)}$ (lbf)	$ER_r^{(d)}$ (lbf)	$V_r^{(c)}$ (lbf)	$ER_r^{(d)}$ (lbf)
9-1/2"	NI-20	1,770	1,770	2,480	2,250	3,190	2,730
	NI-40x	1,890	1,890	2,600	2,400	3,310	2,910
	NI-60	1,890	1,890	2,600	2,400	3,310	2,910
	NI-80	1,890	1,890	2,600	2,250	3,310	2,620
11-7/8"	NI-20	2,240	2,240	2,950	2,850	3,660	3,450
	NI-40x	2,340	2,340	3,050	2,970	3,760	3,600
	NI-60	2,340	2,340	3,050	2,970	3,760	3,600
	NI-80	2,340	2,340	3,050	2,790	3,760	3,240
	NI-90	3,040	2,980	3,750	3,560	4,460	4,130
14"	NI-40x	2,730	2,450	3,440	3,110	4,150	3,770
	NI-60	2,730	2,450	3,440	3,110	4,150	3,770
	NI-80	2,730	2,450	3,440	2,920	4,150	3,400
	NI-90	3,350	2,980	4,060	3,560	4,770	4,130
16"	NI-60	3,110	2,450	3,820	3,110	4,530	3,770
	NI-80	3,110	2,450	3,820	2,920	4,530	3,400
	NI-90	3,680	2,980	4,390	3,560	5,100	4,130

a) Factored shear resistance, V_r , of the unreinforced I-joist.

b) Factored end reaction resistance, ER_r , of the unreinforced I-joist without bearing stiffeners. Minimum bearing length shall be 5-1/2 inches for bearings adjacent to cantilever.

c) Factored shear resistance, V_r , of the reinforced I-joist.

d) Factored end reaction resistance, ER_r , of the reinforced I-joist without bearing stiffeners. Minimum bearing length shall be 5-1/2 inches for bearings adjacent to cantilever.

Notes:

- The tabulated design values are for standard-term duration of load ($K_D = 1.0$).
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