

## Capacity 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 center
Reinforcement on both sides:	2-1/2-inch nails at 6 inches on center offset by 3 inches on the opposite side
Reinforcement type:	APA Rated Sheathing 48/24 or APA Rated Sturd-I-floor 24 oc (minimum 23/32 Performance Category)
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 <sup>(a)</sup> (lbf)	IR <sup>(b)</sup> (lbf)	V <sup>(c)</sup> (lbf)	IR <sup>(d)</sup> (lbf)	V <sup>(c)</sup> (lbf)	IR <sup>(d)</sup> (lbf)
9-1/2"	NI-40x	1,200	2,410	1,460	3,060	1,720	3,710
	NI-60	1,200	2,415	1,460	3,070	1,720	3,720
	NI-80	1,200	2,415	1,460	2,880	1,720	3,350
11-7/8"	NI-40x	1,480	3,000	1,840	3,810	2,190	4,620
	NI-60	1,480	3,005	1,840	3,820	2,190	4,630
	NI-80	1,480	3,005	1,840	3,590	2,190	4,170
	NI-90	1,925	3,355	2,280	4,000	2,640	4,650
14"	NI-40x	1,730	3,130	2,090	3,980	2,440	4,820
	NI-60	1,730	3,140	2,090	3,990	2,440	4,840
	NI-80	1,730	3,330	2,090	3,970	2,440	4,620
	NI-90	2,125	3,355	2,480	4,000	2,840	4,650
16"	NI-60	1,970	3,265	2,330	4,150	2,680	5,030
	NI-80	1,970	3,640	2,330	4,340	2,680	5,050
	NI-90	2,330	3,640	2,690	4,340	3,040	5,050

a) Shear capacity, V, of the unreinforced I-joist.

b) Intermediate reaction capacity, IR, of the unreinforced I-joist without bearing stiffeners. Minimum bearing length shall be 3-1/2 inches for bearings adjacent to cantilever.

c) Shear capacity, V, of the reinforced I-joist.

d) Intermediate reaction capacity, IR, of the reinforced I-joist without bearing stiffeners. Minimum bearing length shall be 3-1/2 inches for bearings adjacent to cantilever.

#### Notes:

1. The tabulated design values are for normal duration of loading ( $C_D = 1.0$ ).
2. Design of I-joists shall be in accordance with the NDS.
3. 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-joint depth
Reinforcement on one side:	2-1/2-inch nails at 6 inches on center (total of 8 nails per joist)
Reinforcement on both sides:	2-1/2-inch nails at 6 inches on center offset by 3 inches on the opposite side (total of 8 nails per side)
Reinforcement type:	APA Rated Sheathing 48/24 or APA Rated Sturd-I-floor 24 oc (minimum 23/32 Performance Category)
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 <sup>(a)</sup> (lbf)	3-1/2" Bearing ER <sup>(b)</sup> (lbf)	V <sup>(c)</sup> (lbf)	3-1/2" Bearing ER <sup>(d)</sup> (lbf)	V <sup>(c)</sup> (lbf)	3-1/2" Bearing ER <sup>(d)</sup> (lbf)
9-1/2"	NI-40x	1,200	1,190	1,560	1,510	1,910	1,830
	NI-60	1,200	1,190	1,560	1,510	1,910	1,830
	NI-80	1,200	1,200	1,560	1,430	1,910	1,660
11-7/8"	NI-40x	1,480	1,430	1,840	1,820	2,190	2,200
	NI-60	1,480	1,430	1,840	1,820	2,190	2,200
	NI-80	1,480	1,450	1,840	1,730	2,190	2,010
	NI-90	1,925	1,780	2,280	2,120	2,640	2,470
14"	NI-40x	1,730	1,500	2,090	1,910	2,440	2,310
	NI-60	1,730	1,500	2,090	1,910	2,440	2,310
	NI-80	1,730	1,530	2,090	1,830	2,440	2,120
	NI-90	2,125	1,790	2,480	2,140	2,840	2,480
16"	NI-60	1,970	1,520	2,330	1,930	2,680	2,340
	NI-80	1,970	1,550	2,330	1,850	2,680	2,150
	NI-90	2,330	1,810	2,690	2,160	3,040	2,510

- a) Shear capacity, V, of the unreinforced I-joist.
- b) End reaction capacity, ER, of the unreinforced I-joist without bearing stiffeners. Minimum bearing length shall be 3-1/2 inches for bearings adjacent to cantilever.
- c) Shear capacity, V, of the reinforced I-joist.
- d) End reaction capacity, ER, of the reinforced I-joist without bearing stiffeners. Minimum bearing length shall be 3-1/2 inches for bearings adjacent to cantilever.

### Notes:

- The tabulated design values are for normal duration of loading ( $C_D = 1.0$ ).
- Design of I-joists shall be in accordance with the NDS.
- 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.