

9.23.4.1.

9.23.4. Allowable Spans

9.23.4.1. Spans for Joists, Rafters and Beams

▶ (1) Except as required in Sentence (2), the spans for wood joists, rafters and beams shall conform to the spans shown in Tables A-1 to A-9 for the uniform *live loads* shown in the tables. (See Appendix A.)

(2) Spans for floor joists which are not selected from Tables A-1 to A-3 and which are required to be designed for the same loading conditions, shall not exceed the design requirements for uniform loading and vibration criteria. (See Appendix A.)

9.23.4.2. Steel Beams

(1) The spans for steel beams with laterally supported top flanges that support floors in 1 and 2 storey houses shall conform to Table 9.23.4.A. (See Appendix A.)

(2) Beams described in Sentence (1) shall at least meet the requirements for Grade 300 W steel in CAN/CSA-G40.21, "Structural Quality Steels".

(3) A beam may be considered to be laterally supported if

- (a) the wood joists bear on its top flange at intervals of 610 mm (24 in) or less over its entire length,
- (b) the load being applied to this beam is transmitted through the joists, and
- (c) 19 mm by 38 mm (1 in by 2 in) wood strips in contact with the top flange are nailed on both sides of the beam to the bottom of the joist supported.

Table 9.23.4.A.
Forming Part of Sentence 9.23.4.2.(1)

Maximum Spans for Steel Beams Supporting Floors in Dwelling Units, mm ⁽²⁾⁽³⁾							
One Storey Supported							
Section	Supported Joist Length, m (Half the sum of joist spans on both sides of the beam)						
	2.4	3.0	3.6	4.2	4.8	5.4	6.0
W150 × 22	4800 ⁽¹⁾	4500 ⁽¹⁾	4200 ⁽¹⁾	4000 ⁽¹⁾	3800 ⁽¹⁾	3700	3500
W150 × 30	5400 ⁽¹⁾	5000 ⁽¹⁾	4700 ⁽¹⁾	4500 ⁽¹⁾	4300 ⁽¹⁾	4200 ⁽¹⁾	4100 ⁽¹⁾
W200 × 21	5700 ⁽¹⁾	5300 ⁽¹⁾	5000	4600	4300	4100	3900
W150 × 37	5900 ⁽¹⁾	5500 ⁽¹⁾	5200 ⁽¹⁾	4900 ⁽¹⁾	4800 ⁽¹⁾	4600 ⁽¹⁾	4500 ⁽¹⁾
W200 × 27	6200 ⁽¹⁾	5800 ⁽¹⁾	5400 ⁽¹⁾	5200 ⁽¹⁾	5000 ⁽¹⁾	4900 ⁽¹⁾	4800 ⁽¹⁾
W200 × 31	6600 ⁽¹⁾	6200 ⁽¹⁾	5800 ⁽¹⁾	5600 ⁽¹⁾	5400 ⁽¹⁾	5300 ⁽¹⁾	5100 ⁽¹⁾
W250 × 24	6800 ⁽¹⁾	6400 ⁽¹⁾	5900	5500	5200	4900	4700
W200 × 36	6800 ⁽¹⁾	6400 ⁽¹⁾	6000 ⁽¹⁾	5800 ⁽¹⁾	5600 ⁽¹⁾	5500 ⁽¹⁾	5300 ⁽¹⁾
W200 × 42	7300 ⁽¹⁾	6700 ⁽¹⁾	6400 ⁽¹⁾	6200 ⁽¹⁾	6000 ⁽¹⁾	5800 ⁽¹⁾	5700 ⁽¹⁾
W200 × 46	7500 ⁽¹⁾	7000 ⁽¹⁾	6700 ⁽¹⁾	6400 ⁽¹⁾	6200 ⁽¹⁾	6100 ⁽¹⁾	5900 ⁽¹⁾
W250 × 33	7700 ⁽¹⁾	7200 ⁽¹⁾	6900 ⁽¹⁾	6600 ⁽¹⁾	6400 ⁽¹⁾	6200 ⁽¹⁾	6000
W250 × 39	8200 ⁽¹⁾	7800 ⁽¹⁾	7400 ⁽¹⁾	7200 ⁽¹⁾	6900 ⁽¹⁾	6700 ⁽¹⁾	6500 ⁽¹⁾
W310 × 31	8500 ⁽¹⁾	8100 ⁽¹⁾	7700	7200	6800	6400	6100
W310 × 39	9400 ⁽¹⁾	8900 ⁽¹⁾	8500 ⁽¹⁾	8200 ⁽¹⁾	7900 ⁽¹⁾	7600 ⁽¹⁾	7300 ⁽¹⁾
W310 × 45	9900 ⁽¹⁾	9400 ⁽¹⁾	9000 ⁽¹⁾	8600 ⁽¹⁾	8300 ⁽¹⁾	8100 ⁽¹⁾	7900 ⁽¹⁾

9.23.4.5.

Table 9.23.4.A. (Cont'd)
Forming Part of Sentence 9.23.4.2.(1)

Maximum Spans for Steel Beams Supporting Floors in Dwelling Units, mm ^(2X3)							
Two Storeys Supported							
Section	Supported Joist Length, m (Half the sum of joist spans on both sides of the beam)						
	2.4	3.0	3.6	4.2	4.8	5.4	6.0
W150 × 22	4000 ⁽¹⁾	3700	3400	3100	3000	2800	2700
W150 × 30	4600 ⁽¹⁾	4300 ⁽¹⁾	4100 ⁽¹⁾	4000 ⁽¹⁾	3700	3600	3400
W200 × 21	4500	4100	3700	3500	3300	3100	3000
W150 × 37	5000 ⁽¹⁾	4800 ⁽¹⁾	4500 ⁽¹⁾	4400 ⁽¹⁾	4200 ⁽¹⁾	4000	3900
W200 × 27	5300 ⁽¹⁾	5000	4600	4300	4000	3800	3600
W200 × 31	5700 ⁽¹⁾	5400 ⁽¹⁾	5100	4700	4500	4200	4000
W250 × 24	5400	4900	4500	4200	4000	3800	3600
W200 × 36	5900 ⁽¹⁾	5600 ⁽¹⁾	5300 ⁽¹⁾	5100	4800	4500	4300
W200 × 42	6300 ⁽¹⁾	6000 ⁽¹⁾	5700 ⁽¹⁾	5500 ⁽¹⁾	5200	4900	4700
W200 × 46	6600 ⁽¹⁾	6200 ⁽¹⁾	5900 ⁽¹⁾	5700 ⁽¹⁾	5500	5200	5000
W250 × 33	6800 ⁽¹⁾	6300	5800	5400	5100	4800	4600
W250 × 39	7300 ⁽¹⁾	6900 ⁽¹⁾	6400	6000	5600	5300	5100
W310 × 31	7100	6400	5900	5500	5100	4900	4600
W310 × 39	8300 ⁽¹⁾	7600	7000	6500	6100	5800	5500
W310 × 45	8800 ⁽¹⁾	8300	7600	7100	6700	6300	6000

Notes to Table 9.23.4.A.:

- (1) Span controlled by deflection limited to L/360.
- (2) For widths of floor intermediate between those shown in the Table, straight line interpolation may be used in determining the maximum beam spans.
- (3) Table is based on:
 - (a) Simply supported beam spans.
 - (b) Laterally supported top flange.
 - (c) Yield strength 300 MPa (44,000 psi).
 - (d) Live Load = 1.9 kN/sq.m (40 lb/ft²)-1st floor.
= 1.4 kN/sq.m (30 lb/ft²)-2nd floor.
 - Dead Load = 1.5 kN/sq.m (31 lb/ft²).

9.23.4.3. Glue-Laminated Beams

(1) The spans for glued-laminated beams that support floors in 1 and 2 storey houses shall conform to Table 9.23.4.B.

(2) Beams described in Sentence (1) shall conform to 20 f-E stress grade in CSA O122, "Glued-Laminated Timber" and to Article 4.3.1.2.

9.23.4.4. Concentrated Loads or Higher Live Loads. Where a floor is required to be designed to support a concentrated load as specified

in Table 4.1.6.B., or to support a uniform *live load* in excess of those shown in the span tables, such spans shall be determined in conformance with Subsection 4.3.1.

9.23.4.5. Concrete Topping. Where a floor is required to support a concrete topping, the spans shown in Tables A-1 and A-2 for the spacing of the members shall be reduced to allow for the loads due to the topping. (See Appendix A.)