

# SPAN TABLES

## SG8 / SG10

- A guide for architects, specifiers and designers
  - Selected and adapted from NZS3604:2011
- Specifying Northbeam SG10 allows you to increase spans, improve stud centres and save on timber volume (highlighted)



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# SPAN TABLES - SG8 / SG10

## ROOF FRAMING - Ridge beams for all wind zones

Ridge beam size (mm x mm)	Loaded dimension of ridge beam (m)															
	1.8				2.7				3.6				4.2			
	Span		Fixing		Span		Fixing		Span		Fixing		Span		Fixing	
	(m)		type		(m)		type		(m)		type		(m)		type	
	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10
<b>(a) Light roof</b>																
190 x 70	2.7	3.0	H	H	2.4	2.6	H	H	2.1	2.4	I	I	1.9	2.3	I	I
240 x 45	2.3	2.6	H	H	1.9	2.2	H	H	1.7	2.0	H	I	1.6	1.9	H	I
290 x 45	2.4	2.7	H	H	2.1	2.4	H	H	1.9	2.1	H	I	1.8	2.0	I	I
190 x 90	3.7	4.2	H	I	3.2	3.6	I	I	2.9	3.3	I	I	2.8	3.1	I	I
240 x 90	4.7	5.3	I	I	4.1	4.6	I	I	3.7	4.2	I	J	3.5	4.0	J	J
290 x 90	5.7	6.4	I	I	5.0	5.6	I	J	4.5	5.0	J	J	4.3	4.8	J	J
<b>(b) Heavy roof</b>																
190 x 70	2.3	2.5	G	H	2.0	2.2	H	H	1.7	2.0	H	H	1.6	1.9	H	H
240 x 45	2.3	2.7	G	H	1.9	2.2	H	H	1.6	1.9	H	H	1.5	1.8	H	H
290 x 45	2.5	2.9	H	H	2.2	2.5	H	H	1.9	2.2	H	H	1.7	2.1	H	I
190 x 90	3.1	3.5	H	H	2.7	3.0	H	H	2.5	2.8	I	I	2.3	2.6	I	I
240 x 90	4.0	4.4	H	H	3.5	3.9	I	I	3.1	3.5	I	I	3.0	3.3	I	I
290 x 90	4.8	5.4	I	I	4.2	4.7	I	I	3.8	4.2	I	I	3.6	4.0	I	J
Fixing type	Fixing to resist uplift												Alternative fixing capacity (kN)			
	Base connection for capacity (kN) built-up studs						Ridge beam to built-up studs									
G	6 / 90 x 3.15 skew nails into bottom plate						10 / 90 x 3.15 nails (5 each side)						4.7			
H	25 x 1 strap with 12 nails to stud						1 / M12 bolt						8.5			
I	2 / 25 x 1 straps with 6 nails to stud and plate. 24 nails total						2 / M12 bolts						16.0			
J	3 / 25 x 1 straps with 12 nails to stud and plate. 36 nails total						2 / M16 bolts						24.0			

NOTE - (1) Fix plate to joist with 1 / M12 x 150 coach screw. (2) Fix plate to joist with 2 / M12 x 150 coach screws. (3) Strap nails to be 30 x 2.5 mm.

# SPAN TABLES - SG8 / SG10

By specifying Northbeam 7.2m lengths, rafter spans may be increased by 10% for rafters continuous over two or more spans. See note below.

## ROOF FRAMING - Rafters for all wind zones

Rafter size (width x thickness)  (mm x mm)	Rafter spacing (mm)															
	480				600				900				1200 (see Note (4))			
	Span		Fixing		Span		Fixing		Span		Fixing		Span		Fixing	
	(m)		type		(m)		type		(m)		type		(m)		type	
	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10
<b>(a) Ordinary rafters for light and heavy roofs</b>																
90 x 45	1.3	1.8	E	E	1.3	1.7	E	E	1.2	1.5	E	E	1.3	1.7	E	E
140 x 45	2.7	3.0	E	E	2.5	2.8	E	E	2.2	2.5	E	E	2.2	2.5	E	E
190 x 45	3.5	4.0	E	E	3.3	3.7	E	E	2.8	3.2	E	E	2.5	2.9	E	E
140 x 70	3.2	3.5	E	E	2.9	3.3	E	E	2.6	2.9	E	E	2.8	3.1	E	E
190 x 70	4.3	4.8	E	E	4.0	4.5	E	E	3.5	3.9	E	E	3.7	4.2	E	F
140 x 90	3.4	3.8	E	E	3.2	3.6	E	E	2.8	3.1	E	E	3.0	3.4	E	E
190 x 90	4.7	5.2	E	E	4.3	4.9	E	E	3.8	4.2	E	E	4.1	4.6	F	F
240 x 90	5.9	6.6	E	E	5.5	6.1	E	E	4.8	5.4	E	F	5.1	5.6	F	F
290 x 90	7.2	7.9	E	E	6.7	7.4	E	E	5.8	6.5	F	F	5.9	6.4	F	SED
240 x 45	3.8	4.3	E	E	3.5	4.0	E	E	3.1	3.5	E	E	2.8	3.2	E	E
290 x 45	4.1	4.6	E	E	3.8	4.3	E	E	3.3	3.7	E	E	3.0	3.4	E	E

The table gives maximum spans for Extra high wind zone. In other wind zones, span lengths shall be multiplied by the following factors:

Low and Medium: 1.3

High and Very high: 1.1

Fixing type	Description	Alternative fixing capacity (kN)
E	2 / 90 x 3.15 skew nails + 2 wire dogs	4.7
F	2 / 90 x 3.15 skew nails + strap fixing	7.0

NOTE -

(1) RAFTER SPANS MAY BE INCREASED BY 10 % FOR RAFTERS CONTINUOUS OVER 2 OR MORE SPANS THAT HAVE NOT BEEN BIRDSMOUTH JOINTED AT INTERMEDIATE SUPPORTS.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) Members 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.

(4) Rafter spacing of 1200 mm does not include heavy roofs.

# SPAN TABLES - SG8 / SG10

## ROOF FRAMING - Rafters for all wind zones (continued)

Rafter size (width x thickness)	Maximum span of valley rafters and their fixing types for all wind zones (m)							
	Light roof				Heavy roof			
	Rafter span		Fixing		Rafter span		Fixing	
	(m)		type		(m)		type	
(mm x mm)	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10
<b>(b) Valley rafters for light and heavy roofs</b>								
90 x 45	1.6	1.8	E	E	1.4	1.6	E	E
140 x 45	2.3	2.5	E	E	2.0	2.2	E	E
190 x 45	2.9	3.1	E	E	2.6	2.8	E	E
240 x 45	3.4	3.7	E	E	3.1	3.3	E	E
290 x 45	3.8	4.3	E	E	3.6	3.9	E	E
90 x 70	1.8	2.0	E	E	1.6	1.8	E	E
140 x 70	2.5	2.8	E	E	2.3	2.5	E	E
190 x 70	3.2	3.5	E	E	2.9	3.1	E	E
Fixing type	Fixing to resist uplift						Alternative fixing capacity (kN)	
E	2 / 90 x 3.15 skew nails + 2 wire dogs						4.7	
NOTE – (1) Proprietary fixings that have the required fixing capacity indicated in tables may be used. (2) Members 90 mm thick may be substituted with built-up members sized and nailed in accordance with 2.4.4.7.								

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By specifying Northbeam SG10, improvements can be made in stud centres and sizes (reducing timber volume)

## WALLS - Studs in loadbearing walls for all wind zones

Wind zone	Loaded dimension* of wall (m)	Stud sizes for maximum length (height) of: (m)																	
		3.6						4.2						4.8					
		At maximum stud spacing (mm) of:						At maximum stud spacing (mm) of:						At maximum stud spacing (mm) of:					
		300	400	600	300	400	600	300	400	600	300	400	600	300	400	600	300	400	600
(mm x mm) (width x thickness)																			
		SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10
<b>(a) Single or top storey – Light and heavy roof</b>																			
Extra high	2.0	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	190 x 45	140 x 90	140 x 90	140 x 90	190 x 90	140 x 90	190 x 90	190 x 90
	4.0	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	190 x 45	140 x 90	140 x 90	140 x 90	190 x 90	140 x 90	190 x 90	190 x 90
	6.0	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	190 x 45	140 x 90	140 x 90	140 x 90	190 x 90	140 x 90	190 x 90	190 x 90
Very high	2.0	140 x 45	90 x 70	140 x 45	90 x 90	140 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 45	190 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 90	190 x 45
	4.0	140 x 45	90 x 70	140 x 45	90 x 90	140 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 45	190 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 90	190 x 45
	6.0	140 x 45	90 x 70	140 x 45	90 x 90	140 x 90	140 x 45	140 x 90	140 x 45	140 x 90	140 x 45	190 x 45	140 x 90	140 x 90	140 x 90	190 x 45	140 x 90	190 x 90	190 x 45
High	2.0	90 x 90	90 x 70	140 x 45	90 x 70	140 x 45	140 x 45	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	140 x 90	140 x 45	140 x 90	140 x 90	190 x 90	140 x 90
	4.0	90 x 90	90 x 70	140 x 45	90 x 70	140 x 45	140 x 45	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	140 x 90	140 x 45	140 x 90	140 x 90	190 x 90	140 x 90
	6.0	90 x 90	90 x 70	140 x 45	90 x 70	140 x 45	140 x 45	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	140 x 90	140 x 45	140 x 90	140 x 90	190 x 90	140 x 90
Medium	2.0	90 x 70	–	90 x 70	90 x 45	140 x 45	90 x 70	90 x 90	90 x 70	140 x 45	90 x 90	140 x 90	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	140 x 90
	4.0	90 x 70	–	90 x 70	90 x 45	140 x 45	90 x 70	90 x 90	90 x 70	140 x 45	90 x 90	140 x 90	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	140 x 90
	6.0	90 x 70	–	90 x 70	90 x 45	140 x 45	90 x 70	90 x 90	90 x 70	140 x 45	90 x 90	140 x 90	140 x 45	140 x 45	140 x 90	140 x 45	140 x 90	140 x 90	140 x 90
Low	2.0	–	–	90 x 70	–	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	140 x 45	140 x 45	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45
	4.0	–	–	90 x 70	–	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	140 x 45	140 x 45	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45
	6.0	–	–	90 x 70	–	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	140 x 45	140 x 45	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45
Internal walls for all wind zones	2.0	–	–	90 x 70	–	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	140 x 45	140 x 45	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45
	4.0	–	–	90 x 70	–	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	140 x 45	140 x 45	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45
	6.0	–	–	90 x 70	–	90 x 70	90 x 70	90 x 70	90 x 70	90 x 90	90 x 70	140 x 45	140 x 45	140 x 45	90 x 90	140 x 45	140 x 45	140 x 90	140 x 45

\* For definition of loaded dimension see 1.3.

NOTE –

(1) Determine the loaded dimension of the wall at floor level and the loaded dimension of the wall above at roof level and use the greater value in this table.

(2) 140 x 45 may be substituted for 90 x 90. 90 x 35 may be substituted for 70 x 45.

(3) Studs 70 mm and 90 mm thick may be replaced with studs of 35 mm and 45 mm thickness respectively, provided they are placed at no more than one half the spacing required for the 70 mm and 90 mm stud they are replacing.

(4) Studs 70 mm and 90 mm thick may be substituted with built-up members sized in accordance with 8.5.1.2 and nailed together in accordance with 2.4.4.7

# SPAN TABLES - SG8 / SG10

## FLOORS - Cantilevered floor joists

Joist size	Joist spacing	Maximum cantilever length of joist supporting:													
		Wall, 1.5 kPa floor load												2 kPa floor load	
		Light roof of span: (m)						Heavy roof of span: (m)						Balcony* floor and balustrade only	
		4.0		8.0		12.0		4.0		8.0		12.0			
(mm x mm)	(mm)	(mm)		(mm)		(mm)		(mm)		(mm)		(mm)			
		SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10
90 x 45**	600	100	150	50	50	50	50	100	100	50	50	50	50	550	550
	450	150	150	50	100	50	50	100	100	50	50	50	50	650	650
	400	150	150	100	100	50	50	100	100	50	50	50	50	700	700
140 x 45**	600	300	300	150	200	100	100	250	250	150	150	100	150	900	900
	450	300	350	200	250	150	150	250	250	150	200	150	150	1100	1100
	400	350	350	250	300	150	200	250	300	200	200	150	150	1150	1150
190 x 45	600	550	550	300	350	200	250	450	450	300	300	250	250	1300	1300
	450	600	600	400	500	250	300	450	500	350	350	250	250	1500	1500
	400	600	650	450	500	300	350	500	500	350	350	250	300	1600	1600
240 x 45	600	800	850	450	600	300	400	650	700	500	500	350	400	1650	1650
	450	900	950	600	750	400	500	700	750	500	550	400	450	1900	1900
	400	900	1000	700	800	450	600	750	800	550	600	450	450	2050	2050
290 x 45	600	1150	1200	700	850	450	600	950	1000	700	750	550	600	2000	2000
	450	1200	1300	900	1050	600	750	1000	1050	750	800	600	650	2350	2350
	400	1250	1350	1000	1100	700	850	1050	1100	750	850	600	650	2500	2500

\* Applies to balconies of domestic self-contained dwellings only. Only these joists may be Grade SG 8 (Wet).

\*\* 90 and 140 joist depth is insufficient where cantilevered balustrades are used.

# SPAN TABLES - SG8 / SG10

By specifying Northbeam 7.2m lengths, spans may be increased by 10%. See note below.

## FLOORS - Floor joists

Floor joist size (mm x mm)	Maximum span* of joists at a maximum spacing (mm) of:					
	400		450		600	
	(m)		(m)		(m)	
	SG 8	SG 10	SG 8	SG 10	SG 8	SG 10
<b>(a) 1.5 kPa floor load (dry in service)</b>						
90 x 45	1.45	1.55	1.40	1.50	1.25	1.30
140 x 45	2.70	2.90	2.60	2.80	2.00	2.15
190 x 45	3.55	3.80	3.45	3.70	3.15	3.35
240 x 45	4.40	4.70	4.30	4.60	3.90	4.20
<b>(b) 2 kPa floor load (wet in service)</b>						
90 x 45	1.60	1.60	1.50	1.50	1.30	1.30
140 x 45	2.50	2.50	2.35	2.35	2.05	2.05
190 x 45	3.40	3.40	3.20	3.20	2.75	2.75
240 x 45	4.30	4.30	4.05	4.05	3.50	3.50
* SPANS MAY BE INCREASED BY 10 % FOR JOISTS CONTINUOUS OVER 2 OR MORE SPANS.						