

Seismic Requirements

The Standards NZS 4203, AS 1170.4 require non-structural building elements to be designed to minimise the risk of loss of life from collapse or damage in the event of an earthquake.

When control joints or perimeter relief is required in the Drywall Grid system by the plasterboard manufacturer, seismic bracing will be necessary to enable the Drywall Grid system to meet the above requirements.

Below are tables providing K-brace design solutions for common installations. Select building location Zone (NZ), Ceiling Area, Plenum Depth, and Gypsum Board Lining - the number is the quantity of the selected brace type **(a)** or **(b)**. For applications not covered here, contact your nearest USG.

New Zealand NZS 4203	No. of K-brace / Area Ceiling Area	Plenum Depth (max)	Gypsum Board Lining								Zone	
			9.5mm		12.5mm		16mm		2 x 16mm			
			(a)*	(b)*	(a)*	(b)*	(a)*	(b)*	(a)*	(b)*		
	9m x 9m	500mm	4	3	5	3	6	4	10	7	A (e.g. Wellington)	
		1000mm	5	4	6	4	7	5	12	9		
	12m x 12m	500mm	7	5	8	5	10	7	18	12		
		1000mm	9	6	10	7	12	9	21	15		
	15m x 15m	500mm	11	7	13	8	16	10	28	18		
		1000mm	13	10	15	11	18	13	33	24		
	9m x 9m	500mm	4	3	4	3	5	3	9	6		B (e.g. Christchurch)
		1000mm	4	3	5	4	6	4	10	7		
	12m x 12m	500mm	6	4	7	5	9	6	15	10		
		1000mm	7	5	8	6	10	7	18	13		
	15m x 15m	500mm	10	6	11	7	13	9	24	15		
		1000mm	11	8	12	9	15	11	27	20		
9m x 9m	500mm	3	2	3	2	4	3	7	5	C (e.g. Auckland)		
	1000mm	4	3	4	3	5	4	8	6			
12m x 12m	500mm	5	3	6	4	7	5	12	8			
	1000mm	6	4	7	5	8	6	14	10			
15m x 15m	500mm	8	5	9	6	11	7	19	12			
	1000mm	9	7	10	7	12	9	22	16			

- Notes**
- 1) Ceiling level assumed worst case.
 - 2) Building risk factor is assumed R = 1.0 - Normal occupancy or usage (NZS 4203 : 1984)
 - 3) For projects Seismic Zone location, refer DONN Seismic Guide Reference 5, or NZS 4203 : 1984.

Australia AS 1170.4	No of K-brace / Area Ceiling Area	Plenum Depth (max)	Gypsum Board Lining							
			10mm		13mm		16mm		2 x 16mm	
			(a)*	(b)*	(a)*	(b)*	(a)*	(b)*	(a)*	(b)*
9m x 9m		500mm	4	3	4	3	5	3	8	5
		1000mm	4	3	5	4	6	4	9	7
12m x 12m		500mm	6	4	7	5	8	5	14	9
		1000mm	7	5	8	6	9	7	16	12
15m x 15m		500mm	10	6	11	5	13	8	22	14
		1000mm	11	8	12	9	14	11	25	18

- Notes**
- 1) Ceiling and building heights are assumed worst case.
 - 2) Seismic Coefficient used is worst case (a = 0.22).
 - 3) Table based on buildings for normal occupancy or usage (Structure Type 1)
 - 4) Table based on soft soil Site Factor. (S = 1.5)

Design Details K Brace

	*Brace type	Rivet type, Top & Bottom	Floor / Structure Fixing
a)	2 x DGPC-40	2 x 4.0 mild steel	2 x No 8 Screws
b)	2 x DJ38	2 x 4.8 mild steel	2 x M 4.5 dynabolt

- All braces are back to back and typically pop-riveted together at 450mm centres maximum.
- All K Braces @ 45 degrees
- K Braces must be evenly distributed over the ceiling area
- 4.5 Dynabolts: Embedment = 25mm
Spacings = 70mm
- No 8 Screws: Embedment = 30mm
Spacings = 40mm
- Plasterboard assumed to be heaviest available per thickness

- For fire rated ceilings, Main Tee braces shall be no closer than 3.6 metres centres and no less than 50mm from fire expansion notch.
- Seismic design based on: Lights + Tees = 2kg/m², and service Load = 3 kg/m² with $\Psi = 0.6$

