Rondo KEY-LOCK®

Concealed Suspended Ceiling Systems

REVISED: APRIL 2008

INCORPORATING:

- **Plasterboard/Fibre Cement Flush Ceiling Systems**
- **Residential Ceiling Batten Systems**
- **Masonry Wall Batten Systems**

RONDO®

DESIGN CONSIDERATIONS

GENERAL INFORMATION

The Rondo KEY-LOCK® Building Board Ceiling Suspension System is a versatile system which gives the designer/architect many options in design for a flush building board ceiling finish.

The Rondo engineered system enables the mixing of primary rails, furring channels and battens, thus allowing for a range of spans and suspension point spacings.

A range of acoustic isolation mounts has been designed for the system and detailed information is available in separate literature from Rondo.

The Rondo KEY-LOCK® Building Board Ceiling Suspension System can be used in both fire rated and non–fire rated situations, and has been designed to meet both Australian and New Zealand standards.

All ceilings must be designed in accordance with the requirements of AS/NZS 2785–2000.

As part of this design process, seismic compliance to AS1170.4 (NZS 4203 for New Zealand) is required. Seismic design is quite complex and cannot be undertaken without explicit knowledge of the ceiling grid system and seismic design parameters.

Australia has predominantly low level seismic activity in the more populated regions and it is not uncommon for the seismic requirements to be minimal, however please contact your engineer or Rondo's Technical Service Department to check compliance of your ceiling system with AS1170.4.

NOTE: Internal ceiling installations should only commence when site conditions detailed in AS/NZS 2785 4.2 and Appendix D2 have been completed.

SAFETY FEATURES

- Rolled edges on the primary rail and furring channel sections make them safer to handle.
- Specially designed locking and suspension clips simplify the assembly of components.
- Components are packaged to meet the Occupational Health and Safety (OH&S) requirements for ease of handling and transportation.
- Suspension clip load tests exceed the requirements of AS/NZS 2785 Section 3.
- All sections are manufactured from galvanised steel with a minimum coating of Z275 and surpass a 72 hour salt spray test.

TIME-SAVING FEATURES

- The name KEY-LOCK® represents a group of components that are engineered to work as a system. All locking and suspension clips snap onto sections easily, without mechanical tools being required.
- Mid-span joiners for both primary rail and furring channel sections eliminates waste, and speeds up erection time.
- Suspension clips are designed for direct fixing to the side of timber or steel purlins and trusses and are tested for both threaded and plain suspension rod systems.
- Some of the wall angle trims can be curved to match curved walls or bulkheads and radiused around columns.
- Better and more consistent levels of finish can be achieved with the user-friendly levelling controls.
- Computer-controlled manufacturing and quality assurance systems enable Rondo to consistently provide a quality product to specifications.
- Rondo supplies the primary rails and Furring Channel in various stock lengths, giving the contractor the option of choosing a product that is suitable for each unique project. Custom lengths are also available, further enhancing these benefits.
- A range of furring channels, battens and primary rails allows for variable spanning and spacing options. This gives the contractor the freedom to put together the most cost effective package for each individual area.
- The option of a furring channel track reduces fixing points by giving support to either end of the grid.
- Rondo can custom radius primary rails and furring channels down to a minimum radius of 1200mm for vaulted ceilings.

STORAGE & HANDLING

Rondo KEY-LOCK® ceiling grid components come in convenient stock-pack and sub-pack quantities for ease of handling and storage.

Rondo KEY-LOCK® ceiling grid components should be handled with care and stored in a dry, protected area away from airborne contaminants such as overspray from brick cleaning processes.

This instruction applies to all products whether designed for internal or external use.

INSTALLATION

Installation should not commence until the building is weathertight *(Refer AS/NZS 2785-2000 4.2).*

Cover Photograph:
Pedare College Auditorium, Golden Grove, SA.
Architect:
Phillips/Pilkington Architects Pty Ltd, Kensington, SA.
Ceiling Contractor:
Laser Linings Pty Ltd, Enfield, SA.
Awards to Laser Linings:
FWCIANZ (Federation of Walls & Ceiling Industries, Australia & NZ); RAIA Award of Excellence; Building Excellence Award 2000, Master Builders Association.

FWCIANZ

STANDARDS

The design tables, material properties, installation details and test data contained within this product brochure have been formulated in accordance with the following Australian and New Zealand standards:

- **AS/NZS 1170:2002**
  Structural design Actions
  Part 0: General Principles;
  Part 1: Permanent, imposed and other actions;
  Part 2: Wind actions;
  Part 3: Snow loads;
  Part 4: Earthquake loads.
- **AS/NZS 1397:2002**
  Steel Sheet and Strip
- **AS 2331.3.1:2001**
  Neutral Salt Spray Test
- **AS/NZS 2589.1:1997**
  Gypsum Linings in Residential and Light Commercial Construction
- **AS/NZS 2785:2000**
  Suspended Ceilings – Design and Installation
- **AS 3623:1993**
  Domestic Metal Framing
- **AS 4055:1992**
  Wind Loads for Houses
- **AS/NZS 4600:1996**
  Cold Formed Steel Structures
- **NZS 4203:1992**
  New Zealand Loading Code

COMPLIANCE WITH NEW ZEALAND BUILDING CODE

Rondo KEY-LOCK® Concealed Suspended Ceiling Systems, when installed in full compliance with the Rondo KEY-LOCK® technical brochure, will meet the requirements for:

- B1 Structure
- B2 Durability for 15 years, and
- F2 Hazardous Building Materials

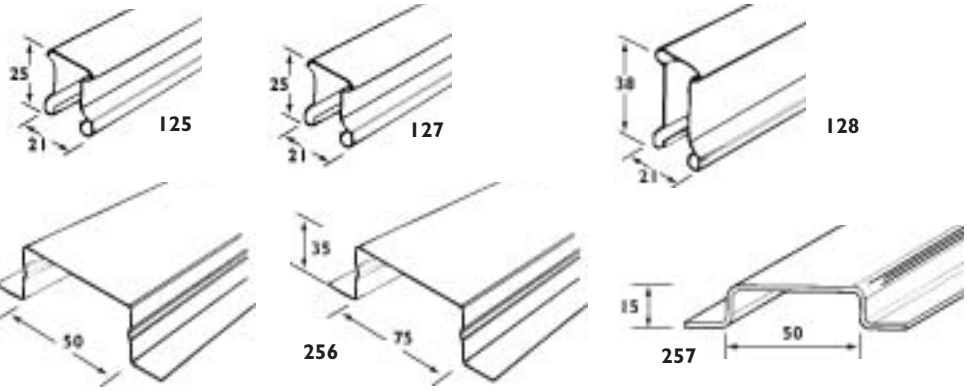
Lloyd's Register Quality Assurance (LRQA) has certified Rondo Building Services Pty Ltd's Quality Management System as complying with ISO9001 in New South Wales, Queensland, Victoria, South Australia & Western Australia.

CONTENTS

RONDO KEY-LOCK® COMPONENTS

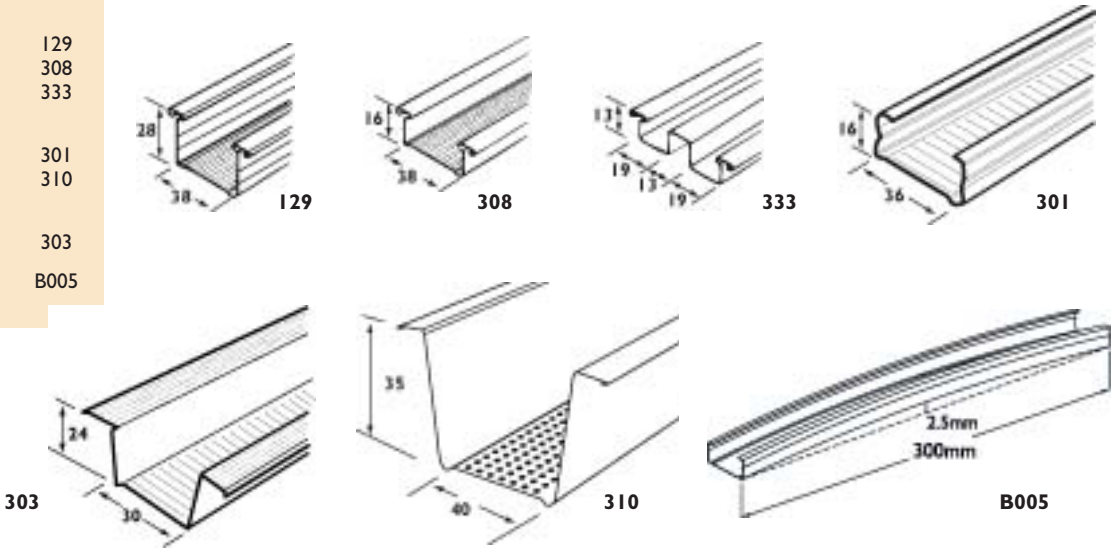
PRIMARY SECTIONS

DESCRIPTION	PART NO
Top Cross Rails	
25 x 21 x .55*	125
25 x 21 x .75*	127
38 x 21 x .75*	128
35 x 50 x 1.15	255
35 x 75 x 1.15	256
15 x 50 x 1.15	257



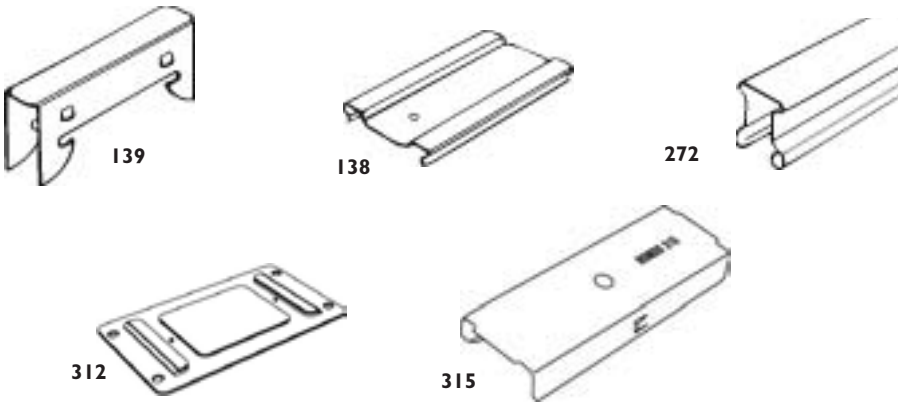
SECONDARY SECTIONS

DESCRIPTION	PART NO
Furring Channels:	
28mm*	129
16mm*	308
Recessed	333
Ceiling Battens:	
16mm	301
35mm	310
Cyclonic Batten	
24mm	303
Stitching Batten	B005



PRIMARY TO SECONDARY AND SECTION JOINERS

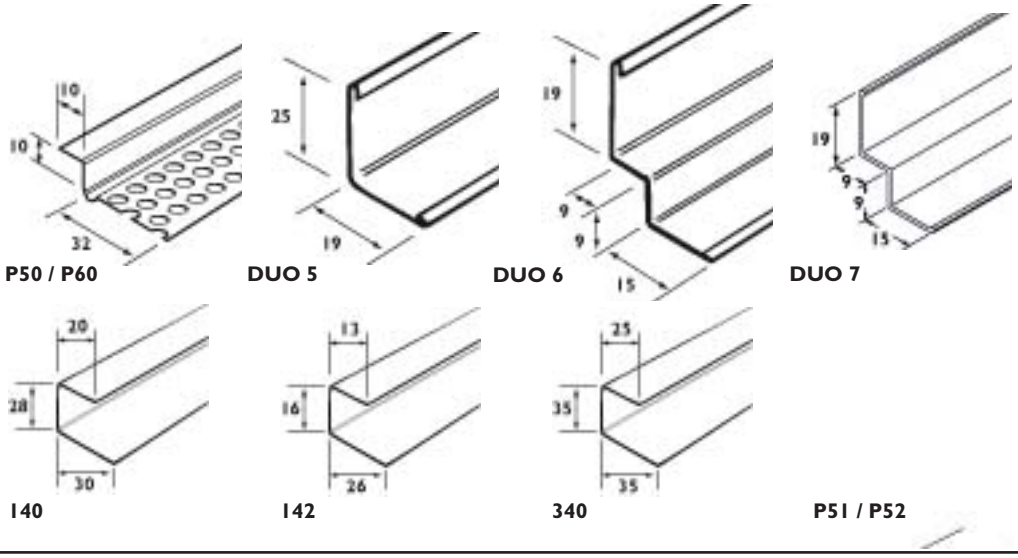
DESCRIPTION	PART NO
TCR 125/127/128 to furring channel	139
Furring Channel 129/308	138
TCR 125/127/128	272
Ceiling Batten 301	315
Ceiling Batten 310	312



** Radiused sections available on request*

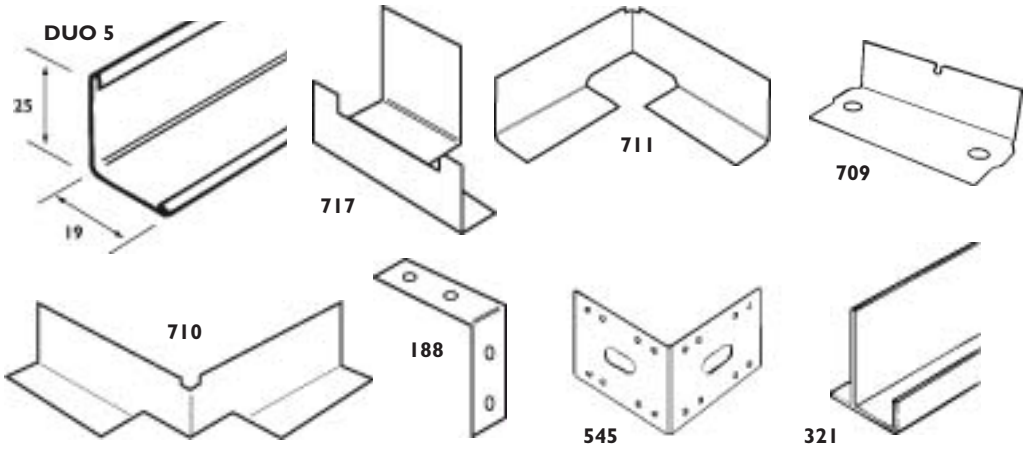
PERIMETER TRIMS

DESCRIPTION	PART NO
Shadowline Stopping Angle:	
10 x 10	P50
6 x 10	P60
Wall Angle/ Bulkhead Trim	DUO 5
Shadowline Wall Angle:	
– Steel	DUO 6
– Aluminium	DUO 7
Furring channel Track	
– suit 129	140
– suit 308	142
Batten Track	
– suit 310	340
Shadow Stopping Bead	
– 10mm	P51
– 13mm	P52



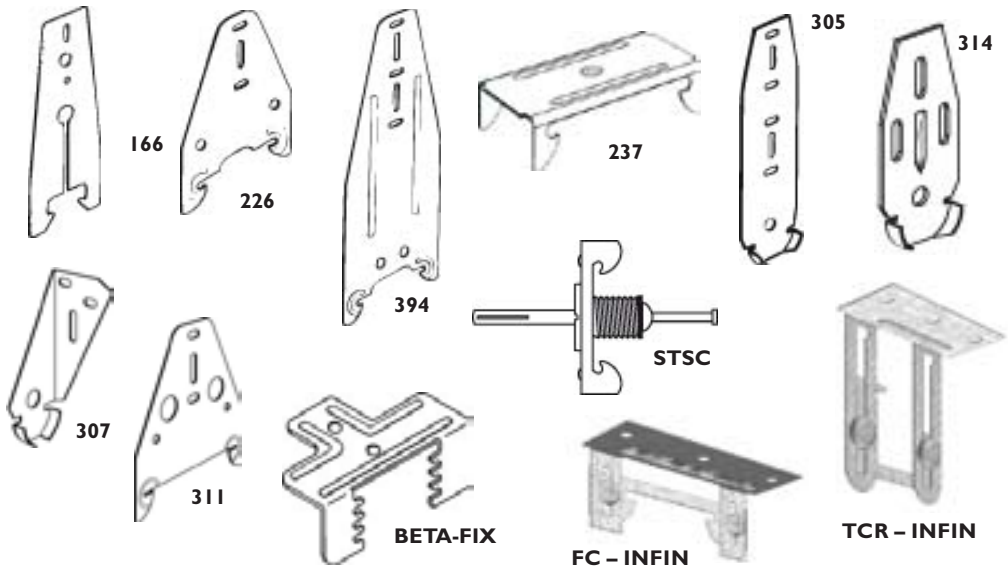
BULKHEAD COMPONENTS

DESCRIPTION	PART NO
Lipped Wall Angle/ Bulkhead Trim	DUO 5
Support Clip	717
Internal Corner Angle	711
External Corner Angle	710
Joiner – DUO 5 Bulkhead Trim	709
Angle Bracket	188
L Bracket	545
Bulkhead Trim – Aluminium	321



DIRECT FIXING CLIPS

DESCRIPTION	PART NO
TCR 127/128 – 80mm	166
Furring channel – 75mm	226
–175mm	394
Furring Channel Anchor Clip	237
301 Ceiling Batten – 92mm	314
– 150mm	305
– 90°	307
310 Ceiling Batten	311
Adjustable Wall/Ceiling FC Clip	BETA-FIX
Adjustable Wall/Ceiling FC Anchor	STSC
INFINITI Sliding Adjustable Clips	
– For TCR	TCR–INFIN
– For FC	FC–INFIN



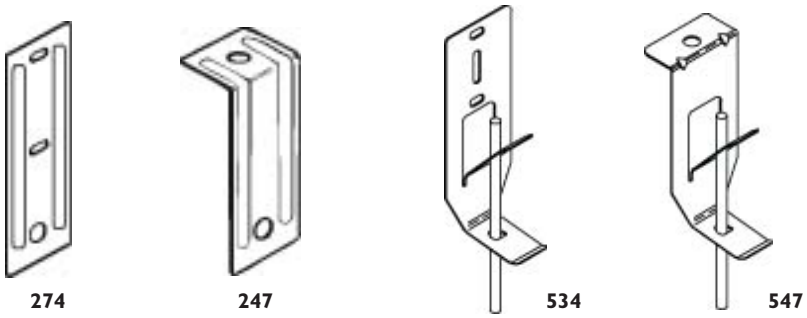
** Radiused sections available on request*

RONDO KEY-LOCK® COMPONENTS

(CONTINUED)

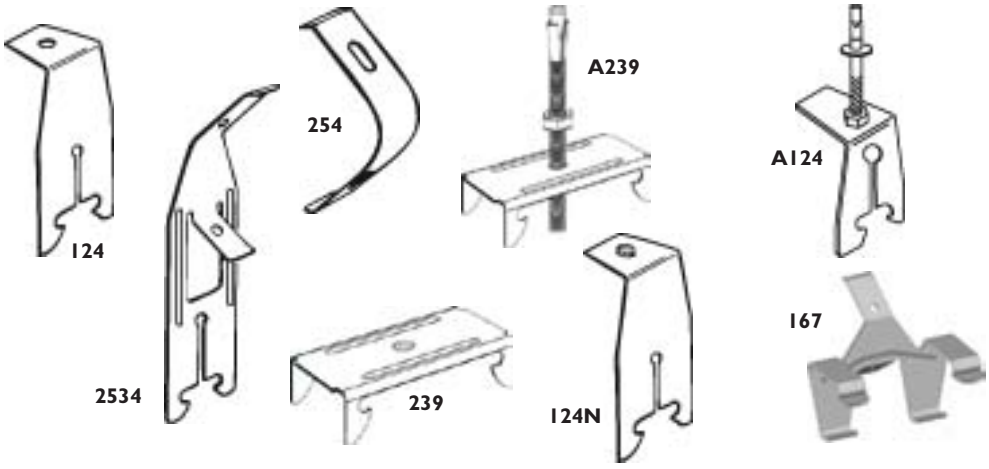
SUSPENSION ROD BRACKETS

DESCRIPTION	PART NO
Suspension Rod Bracket 80mm	274
Suspension Rod Angle Bracket 55mm	247
Adjustable Suspension Hangers:	
– Purlins110mm	534
– Concrete 80mm	547



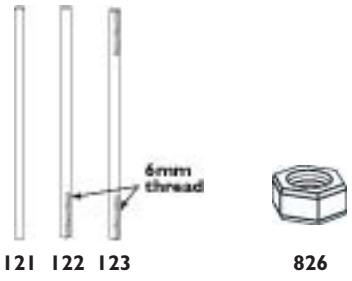
ADJUSTABLE SUSPENSION CLIPS

DESCRIPTION	PART NO
TCR Clip – thread adjusted 60mm	124
TCR Clip and Rod Joiner 100mm	2534
Suspension Rod Joiner	254
FC Anchor Clip with M6 nut	239
Assembly	
– Throughbolt–239	A239
– Throughbolt–124N	A124
TCR Thread Adjusted (inc. nut) 60mm	124N
TCR Side Mount Clip	167



SUSPENSION ROD/ ACCESSORIES

DESCRIPTION	PART NO
5mm Soft Galv. Rod – Plain	121
5.2mm Soft Galv. Rod	
– 6mm thread one end	122
– 6mm thread both ends	123
M6 Nut	826



FIRE TESTED SYSTEMS

These are systems developed and tested by the various building board manufacturers using individual Rondo metal components to give fire rating levels from 30/30/30 up to 120/120/120. Refer to the building board manufacturers technical literature for product identifications for correct use and applications.

INSTALLATION DETAILS

SUSPENDED CEILINGS: NON-FIRE RATED

NOTE
The work shall comply with the requirements of the standards listed previously, and undertaken by qualified trades persons.

STEP ONE
Fix Furring Channel Track along both walls and at 90° to the direction of the furring channel.

STEP TWO
Cut suspension rod to length. Attach direct fixing clip (534 or 547) to one end and TCR clip 2534 to other end. Fix assembly to one side of truss, purlin or concrete with appropriate fixings and at required centres *(see span tables, page 25-26)* when using Furring Channel Track.
If Furring Channel Track is not being used, the first and last Top Cross Rail should be no more than 200mm from the end of each run of Furring Channel. *(Refer Figures 1 & 2).*

STEP THREE
Adjust all hangers to correct drop using string line or laser.

STEP FOUR
Attach Top Cross Rails to suspension clips. Join primary rails end to end using Joiner 272. Also using Joiner 272 on each end of the top cross rail run, tap joiner up against the walls to stabilise the system.
(Refer Figures 3 and 4.)

NOTE: For fire rated systems, leave a 20mm gap at the end of each Top Cross Rail.

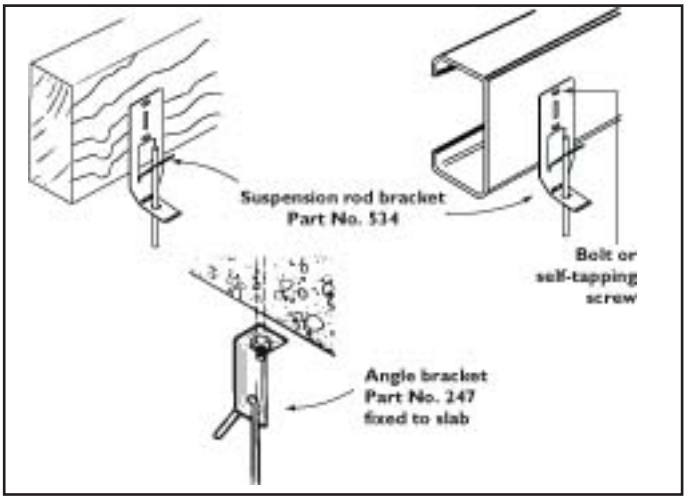


FIGURE 1: Suspension Rod Brackets

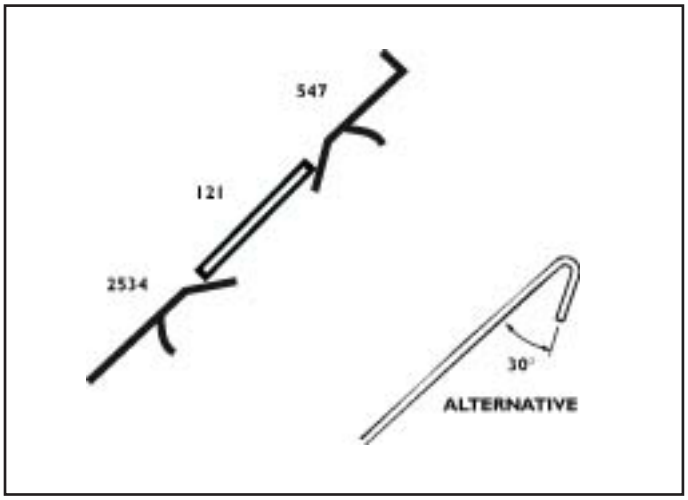


FIGURE 2: Suspension Rod Assembly

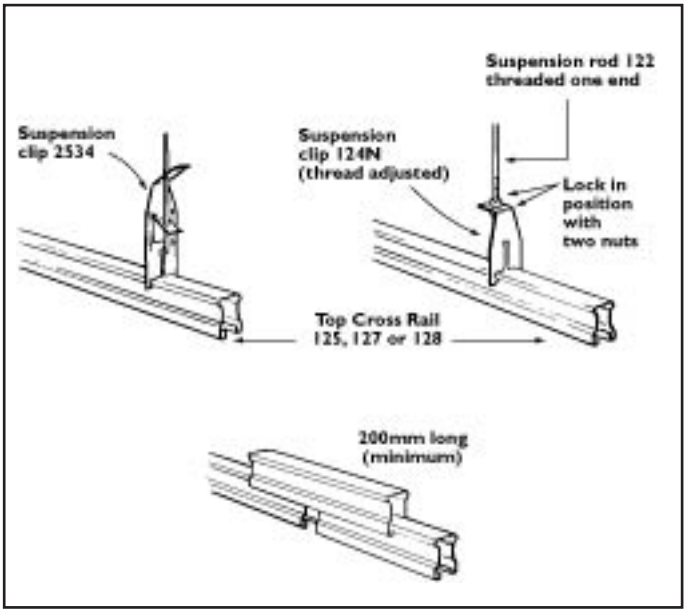


FIGURE 3:Top Cross Rail Attachment

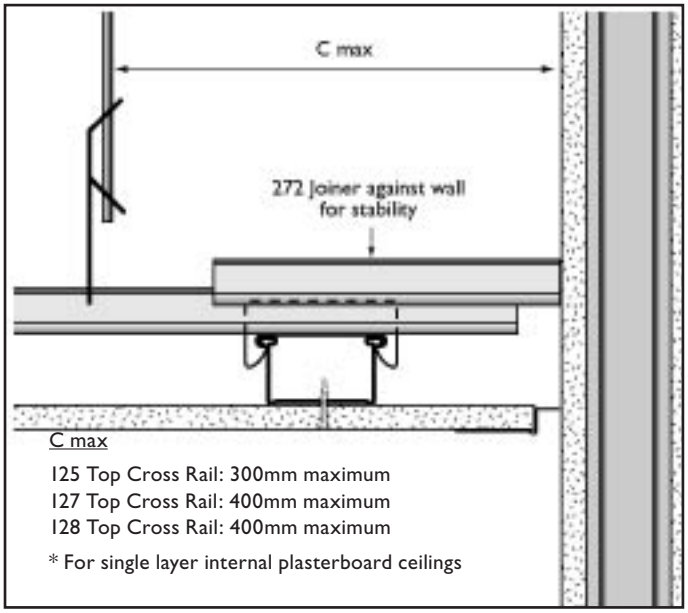


FIGURE 4: Stabilising the system

INSTALLATION DETAILS

(CONTINUED)

SUSPENDED CEILINGS: NON-FIRE RATED

STEP FIVE

Using the 139 locking keys, connect both the Top Cross Rail and Furring Channel together. Space the Furring Channel at the building board manufacturers specifications. Join the Furring Channels end to end using 138 Joiners. Ensure that the ends of the Furring Channel are connected into the Furring Channel Track. *(Refer Figure 5.)*

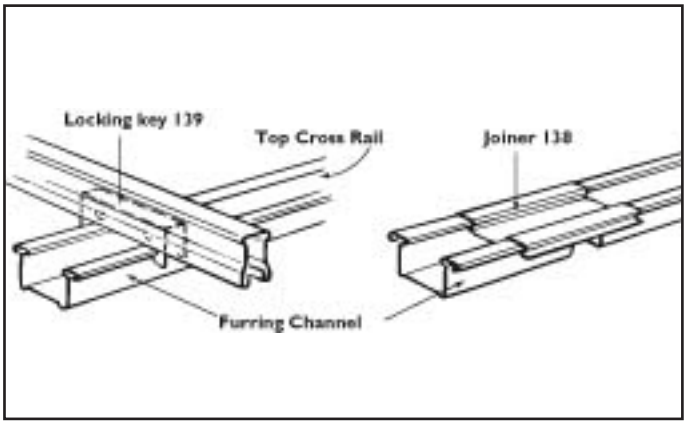


FIGURE 5: Connecting to Furring Channel

NOTE: For fire rated systems, leave a 20mm gap at the end of each Furring Channel and TCR. Joints in the furring channels and top cross rails should be staggered throughout the ceiling grid *(refer to building board manufacturer for recommended spacing)*.

STEP SIX

Install lining sheet as per the building board manufacturer's recommendations.
Light fittings and air conditioning grills can also be installed. *(Refer Figure 6.)*

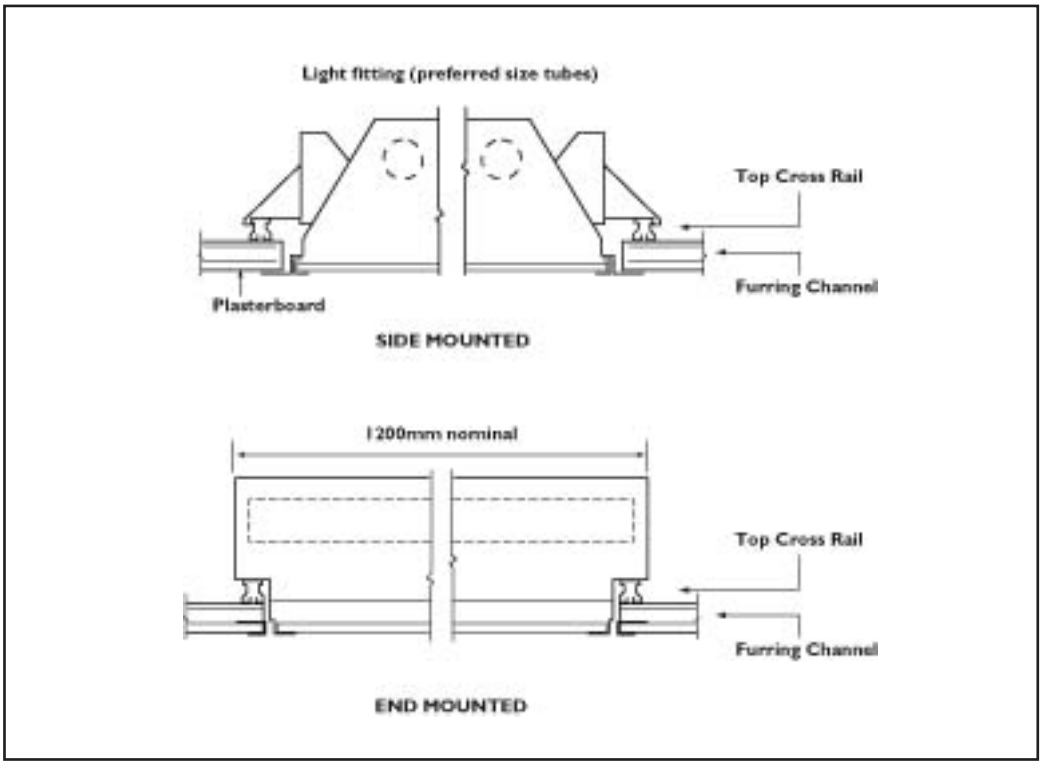


FIGURE 6: Light Fittings (nominal 1200x600mm)
Note: Additional suspension is required to carry light fittings or other ceiling attachments.

NOTE: For additional loads, consult the maximum load tables on pages 32–34.

STEP SEVEN

For examples of typical perimeter finishing methods, refer Figures 8 & 9 on Page 10.

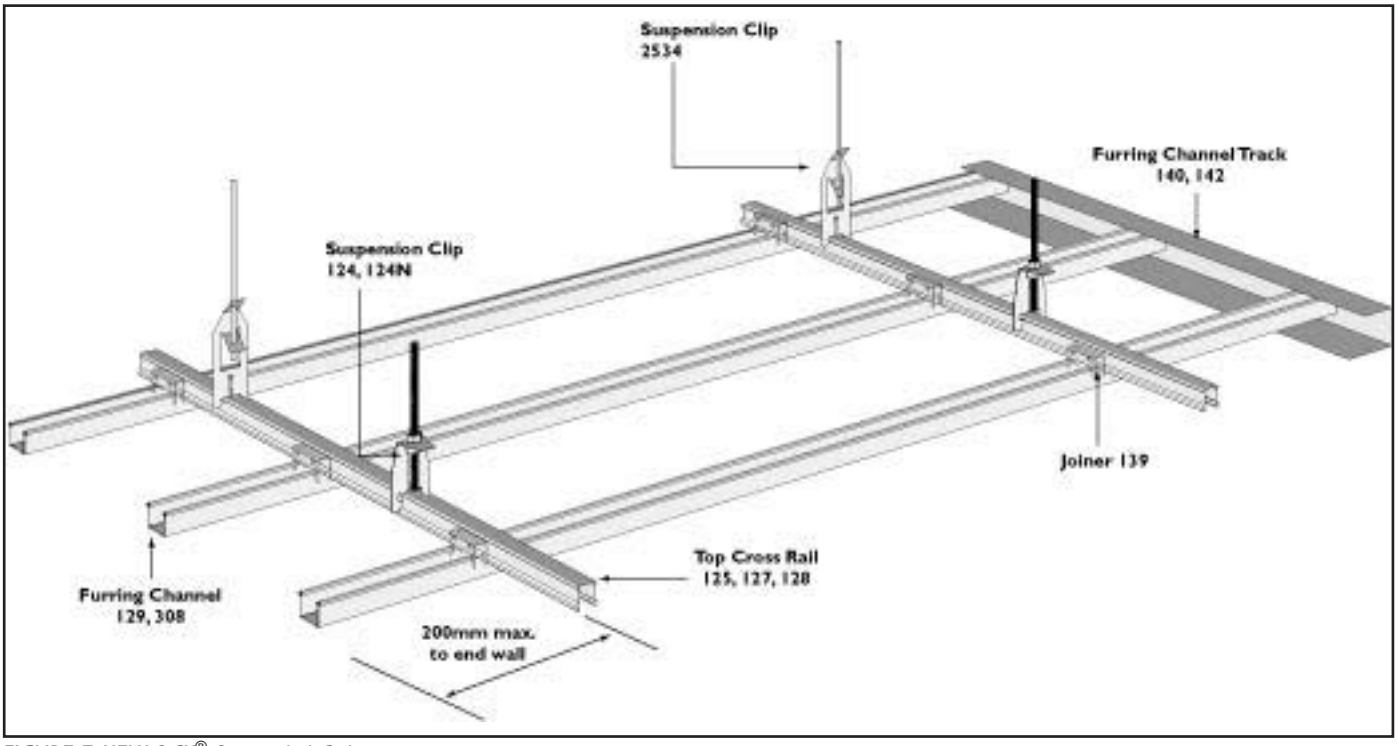
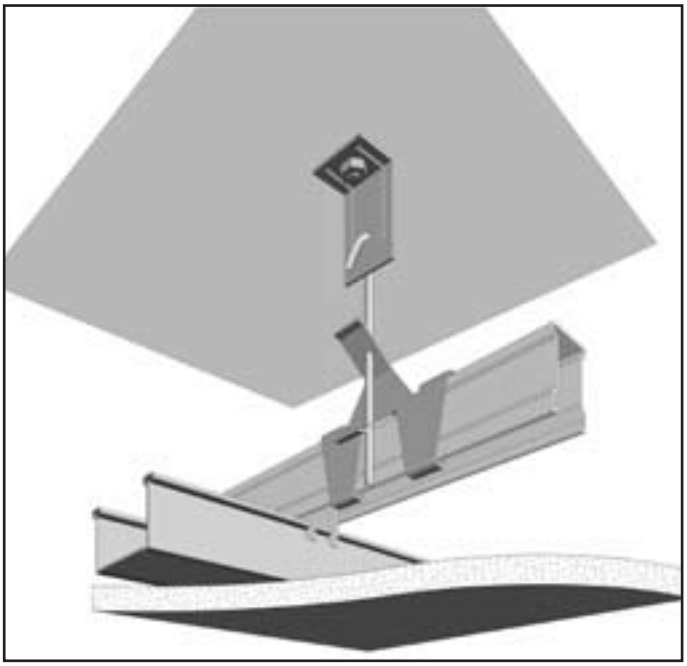
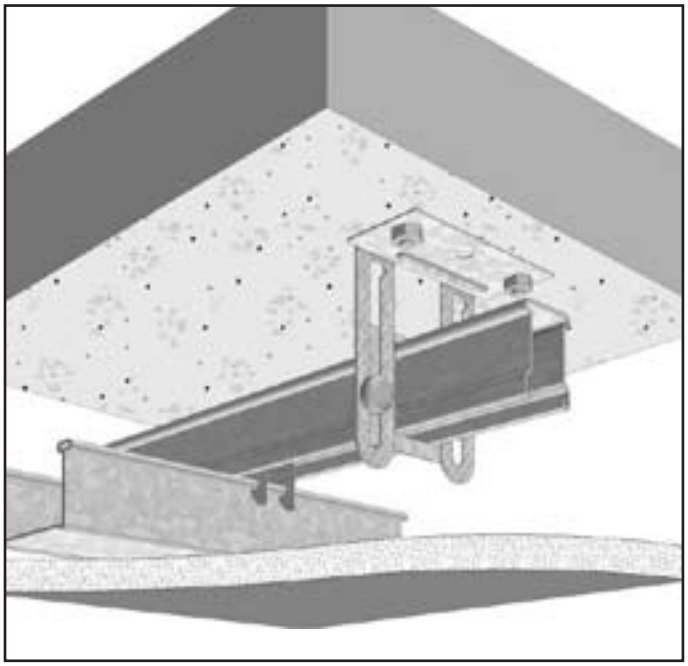


FIGURE 7: KEY-LOCK® Suspended Ceiling



TCR Side Mount Clip Pt No: 167



INIFINITI Sliding Adjustable Clip to TCR

INSTALLATION DETAILS

(CONTINUED)

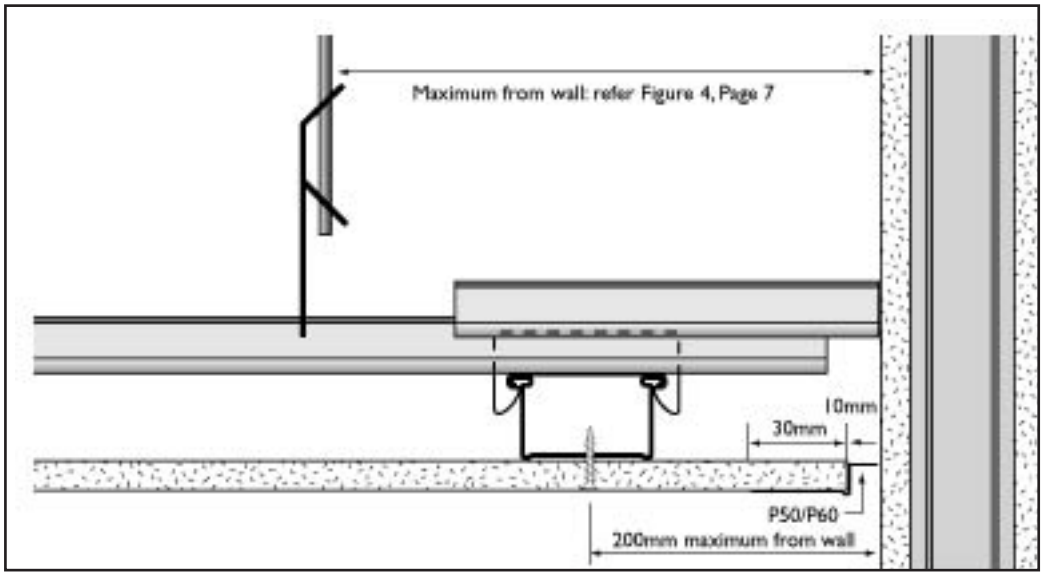


FIGURE 8: Typical Perimeter Finish Detail with Shadowline

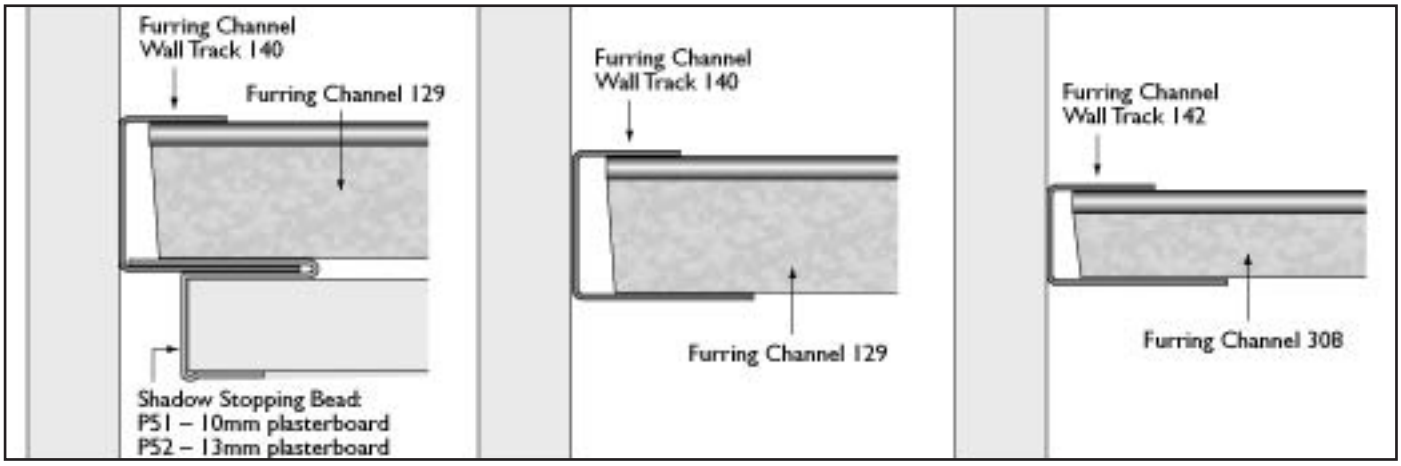
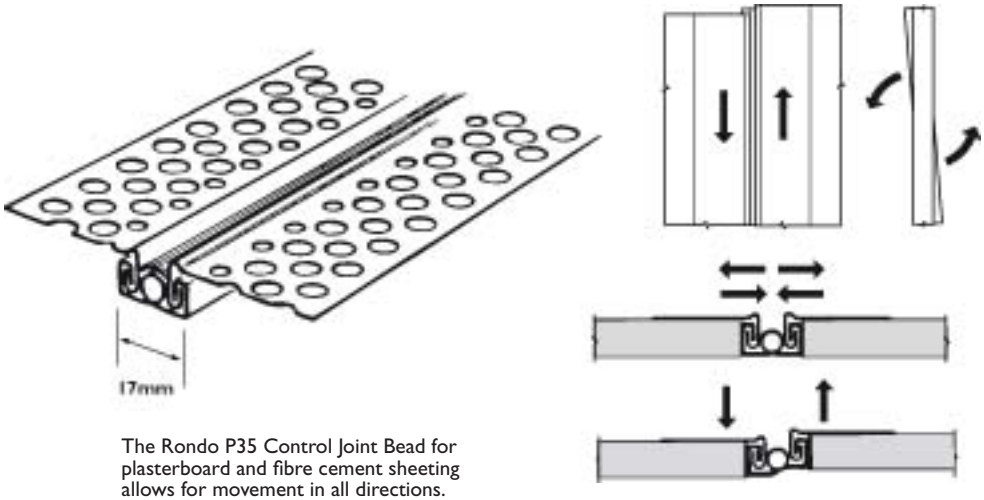


FIGURE 9: Furring Channel Wall Tracks

CONTROL JOINTS

Control joints incorporated in a building to permit movement in the structure must be carried through all areas lined with building board.
Rondo P35 control joint section should also be used when a building board surface abuts a dissimilar wall assembly. It is also recommended by the building board manufacturers that Rondo P35 control joints are installed when continuous ceiling lengths exceed 12m in any direction.



The Rondo P35 Control Joint Bead for plasterboard and fibre cement sheeting allows for movement in all directions.
Spacing: < 12 metres

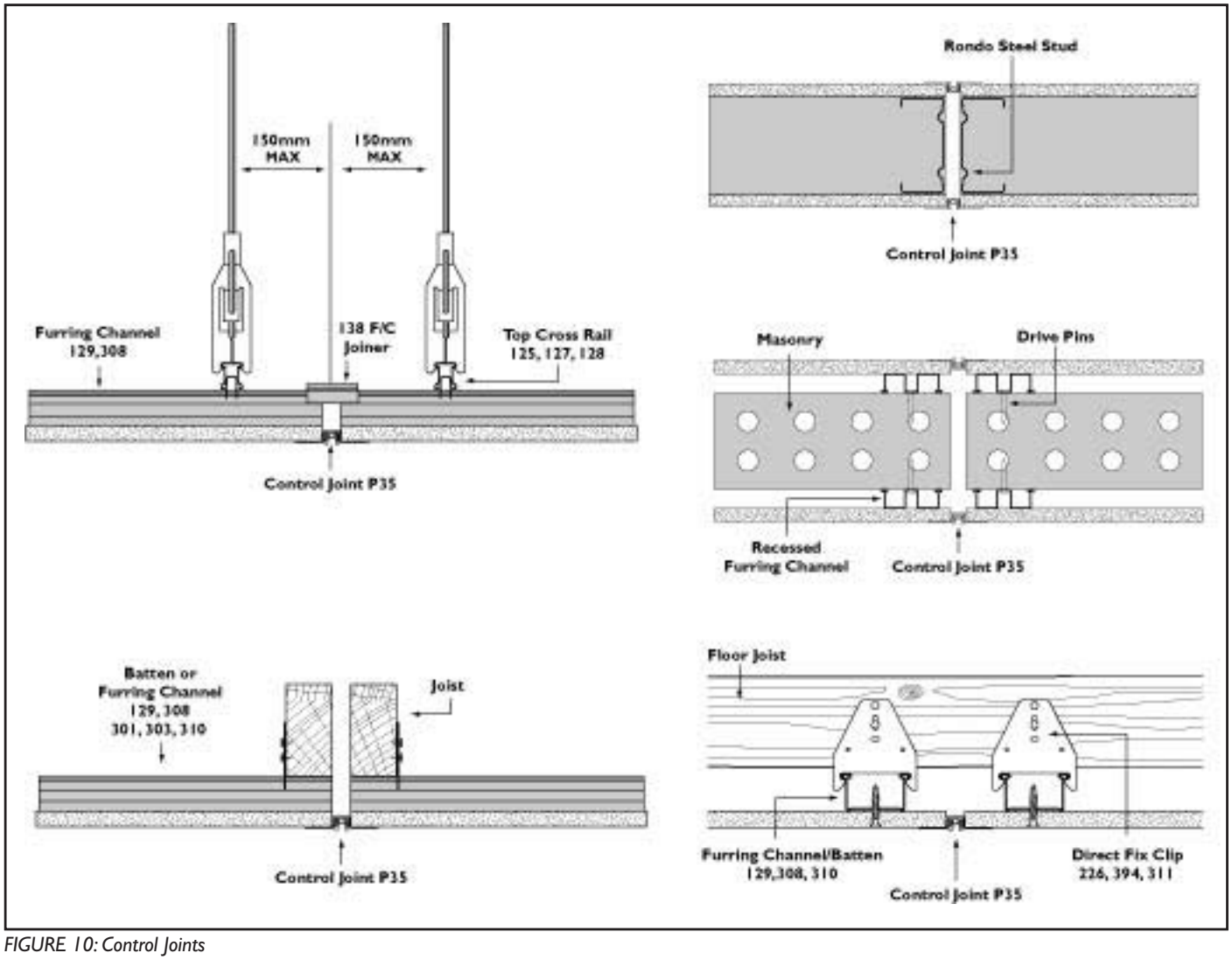


FIGURE 10: Control Joints

INSTALLATION DETAILS

(CONTINUED)

EXTERNAL SUSPENDED CEILING SYSTEM

When installing the Rondo KEY-LOCK® suspended ceiling system in external applications, consideration should be given to wind pressure which may occur. For Downstrut details, refer to Figure 11.

WIND LOADING TABLE

The accompanying table shows the maximum spacing for part number 128 top cross rail and maximum suspension point spacing along the top cross rail for the wind pressures indicated. The limit state loading needs to be determined in accordance with AS/NZS 1170.2 and the load combinations specified in AS/NZS 2785.

The downstrut acts in compression under an upward wind load and therefore nominal fixings are required at either end.

NOTE: Check with the building board manufacturer for correct spacing of furring channels (part number 129).

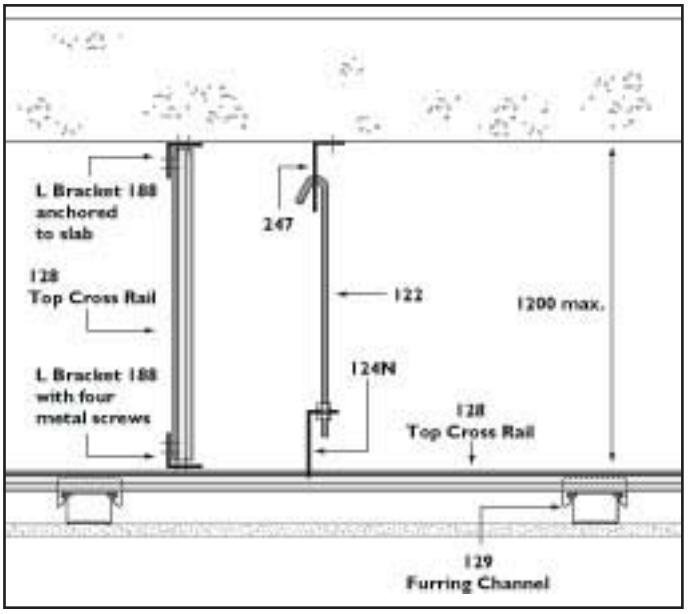


FIGURE 11: Downstrut Detail

TABLE 1: Ultimate Load capacity for 128 Top Cross Rail

SUPPORT CONFIGURATION		LIMIT STATES	
TCR SPACING (mm)	**TCR SUPPORT CENTRES** (mm)	**ULTIMATE LIMIT STATE** (kPa)	**SERVICEABILITY LIMIT STATE** (kPa)
1200	1200	0.24	0.24
900	1200	0.32	0.32
900	900	0.79	0.79
900	600	1.19	1.19
600	600	2.60*	2.60*

NOTES:
1. The above table gives the limit state load capacity for various ceiling configurations. The direction of loading may be upward or downward, provided the ceiling is installed with downstrutting as per Figure 11.
2. Slab connections to be independently checked.
3. Serviceability limit state deflection limited to L/250.
4. Lining contribution has been ignored in analysis.
5. Number 129 Furring Channels to be installed at 600 ctrs for TCR span=1200mm and 450 ctrs for TCR span=900mm or less.
6. Limit state load combinations to be calculated in accordance with AS/NZS 1170.0 or AS/NZS 2785.
7. * Capacity controlled by connections.

DIRECT FIXING OF FURRING CHANNEL BATTENS

Direct fixing of furring channels and battens to either concrete, steel or timber wall or ceiling structures can be done using one of the many direct fixing clips as shown in Figure 12.
The maximum drop for direct fixing should be limited to 200mm. Any drop greater than 200mm requires a full Rondo suspension system.
Direct fixing clips need to be fixed along the sections in accordance with the relevant maximum span tables.
Furring channels should be spaced in accordance with the building board manufacturers recommendations.

IMPORTANT NOTE:
It is not recommended to screw or nail fix battens or furring channels directly to timber joist supporting a trafficable floor due to deflection of the joist occurring and possible subsequent interaction with the ceiling batten. Use only direct fixing clips as shown on page 5.

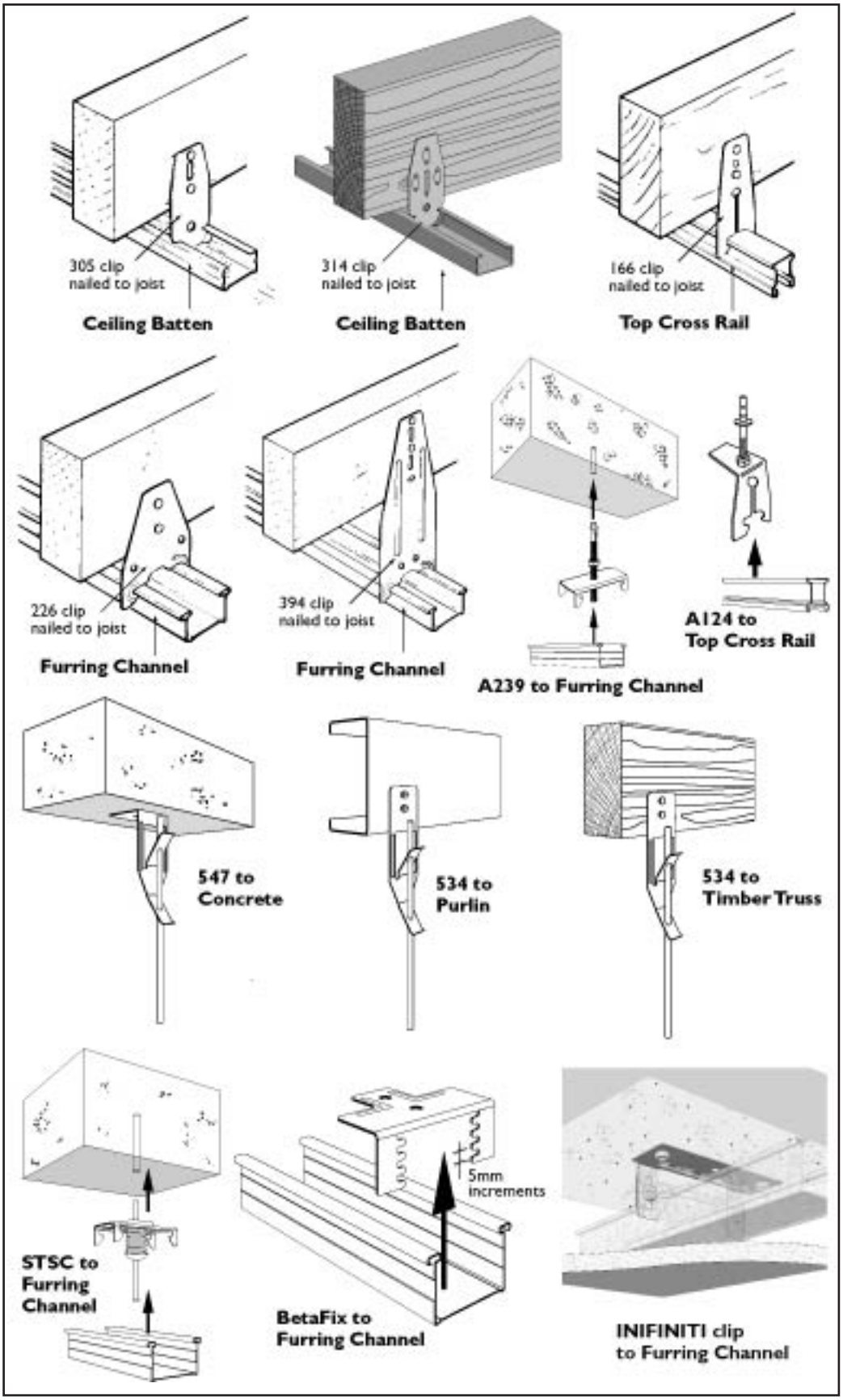


FIGURE 12: Direct Fixing Clips

INSTALLATION DETAILS

(CONTINUED)

BULKHEAD INSTALLATION

The Rondo Square Line Bulkhead System allows easy, economical and true bulkhead corner finishes to be achieved by using concealed support clips and fixings.

STEP ONE
Install the metal framework and fix the building board to the horizontal surface.

STEP TWO
Attach Support Clip 717 to the framework, with the bottom leg hard up against the building board. A string line can be used to assist if required.
(Refer Figure 13.)

STEP THREE
Introduce the Bulkhead Trim DUO 5 to the support clips.
(Refer Figure 14.)

STEP FOUR
Join Bulkhead Trim end to end using Joiners 709 to give a flush finish. Join Bulkhead Trim at corners using Internal Corner Angles 711, and External Corner Angles 710.
(Refer Figure 15.)

STEP FIVE
Introduce the vertical building board as shown below, and screw fix to the framework.
(Refer Figure 16.)

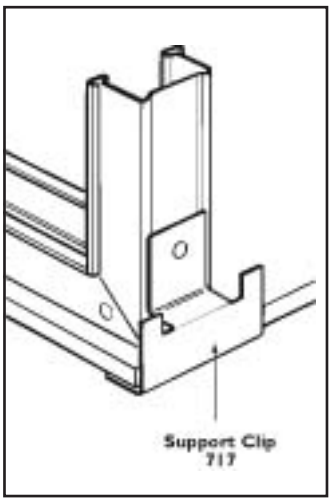


FIGURE 13: Support Clips

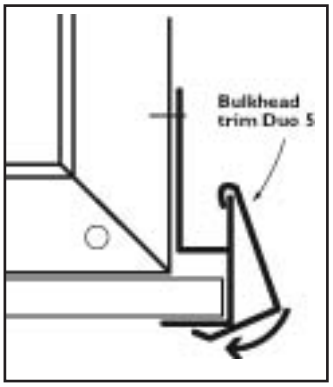


FIGURE 14: Bulkhead Trim

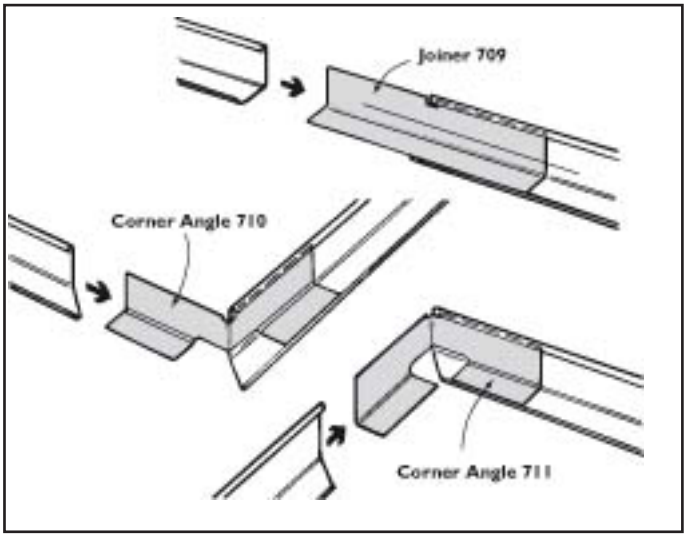


FIGURE 15: Bulkhead Details

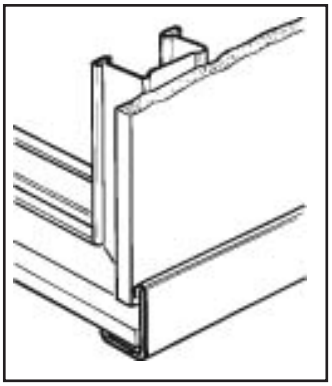


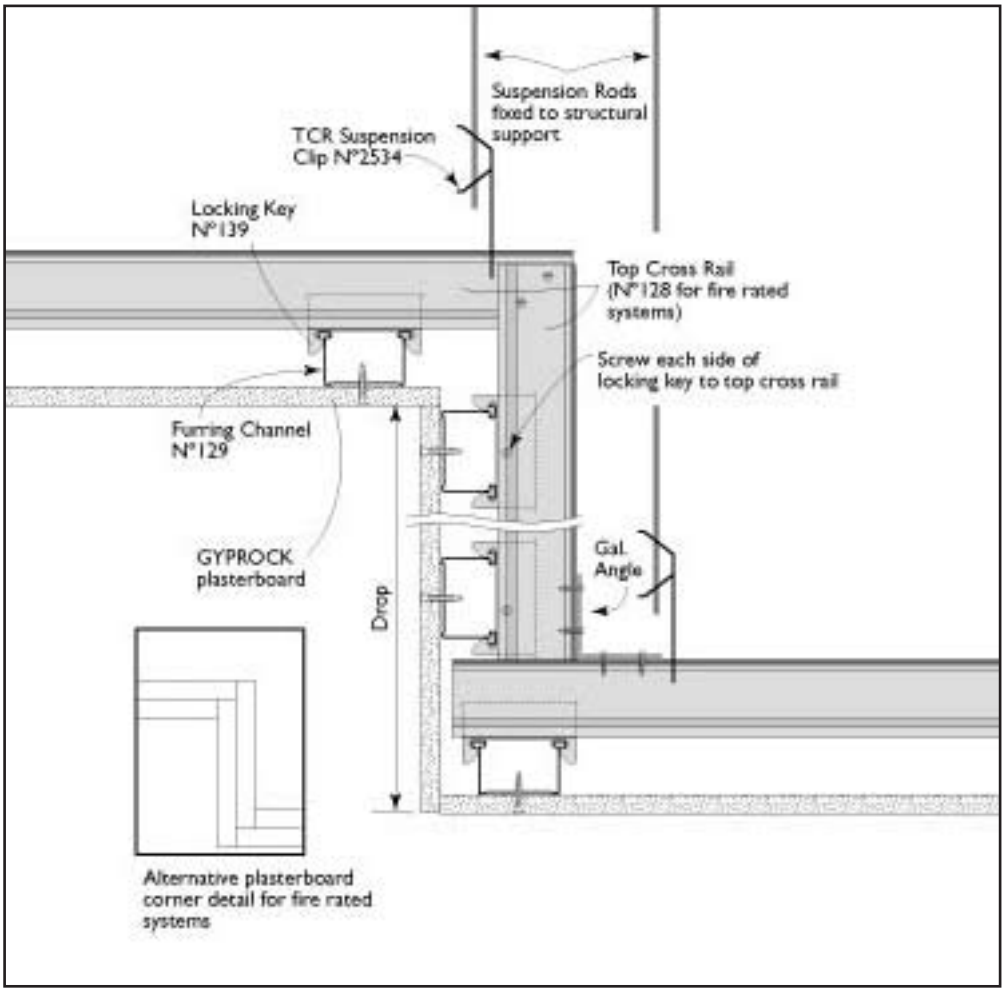
FIGURE 16:Vertical Members

TYPICAL APPLICATION DETAILS

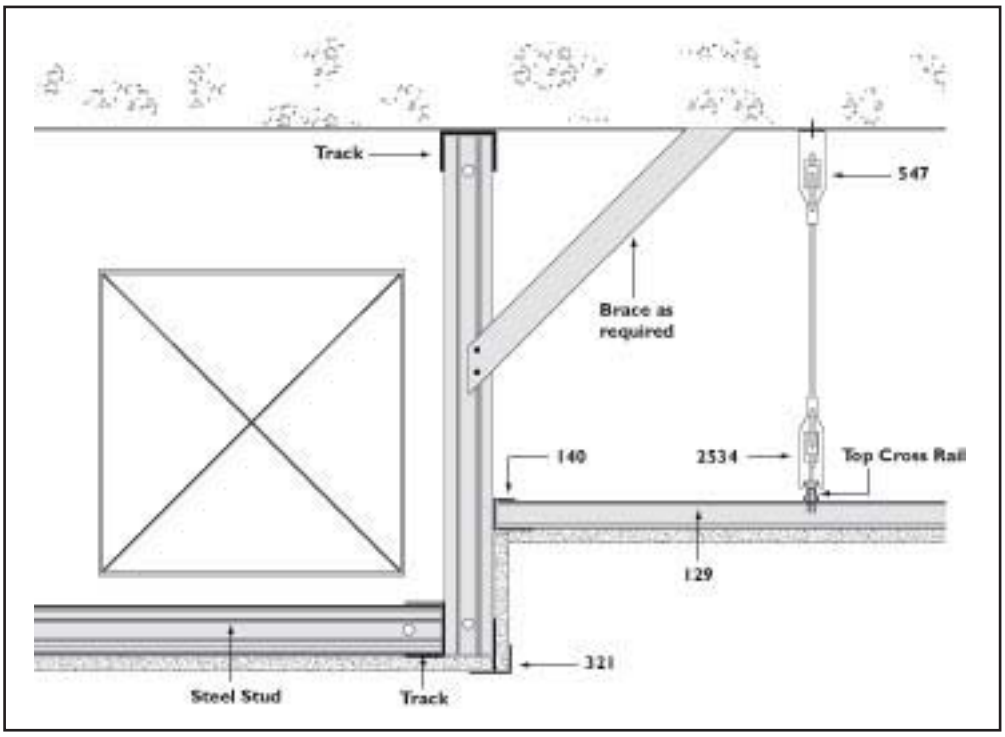
BULKHEADS

The maximum drop of bulkheads is not to exceed 1200mm for suspended bulkheads.

SUSPENDED BULKHEAD 'A'



FRAMED BULKHEAD 'B'



TYPICAL APPLICATION DETAILS

(CONTINUED)

CURVED CEILINGS

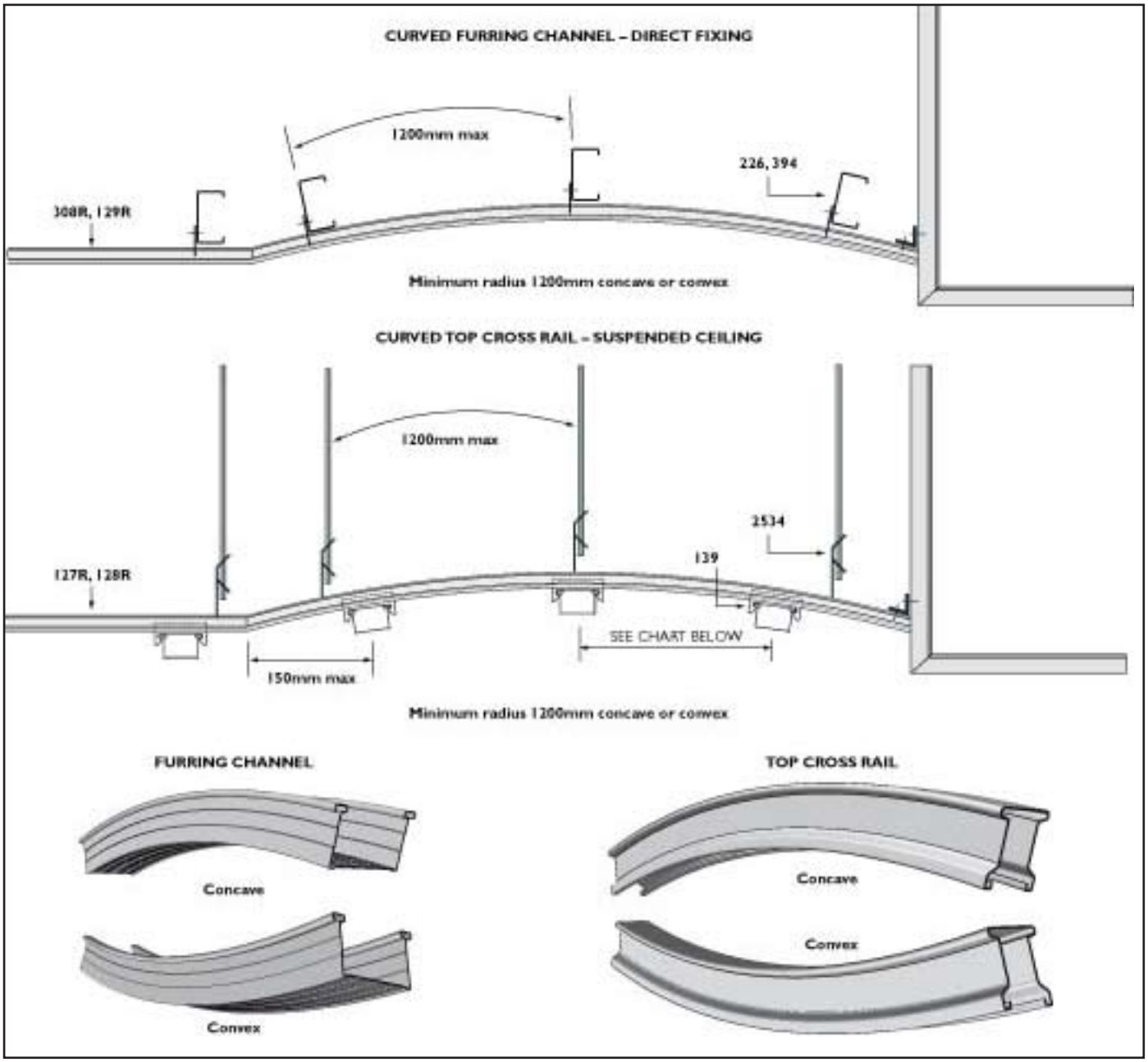
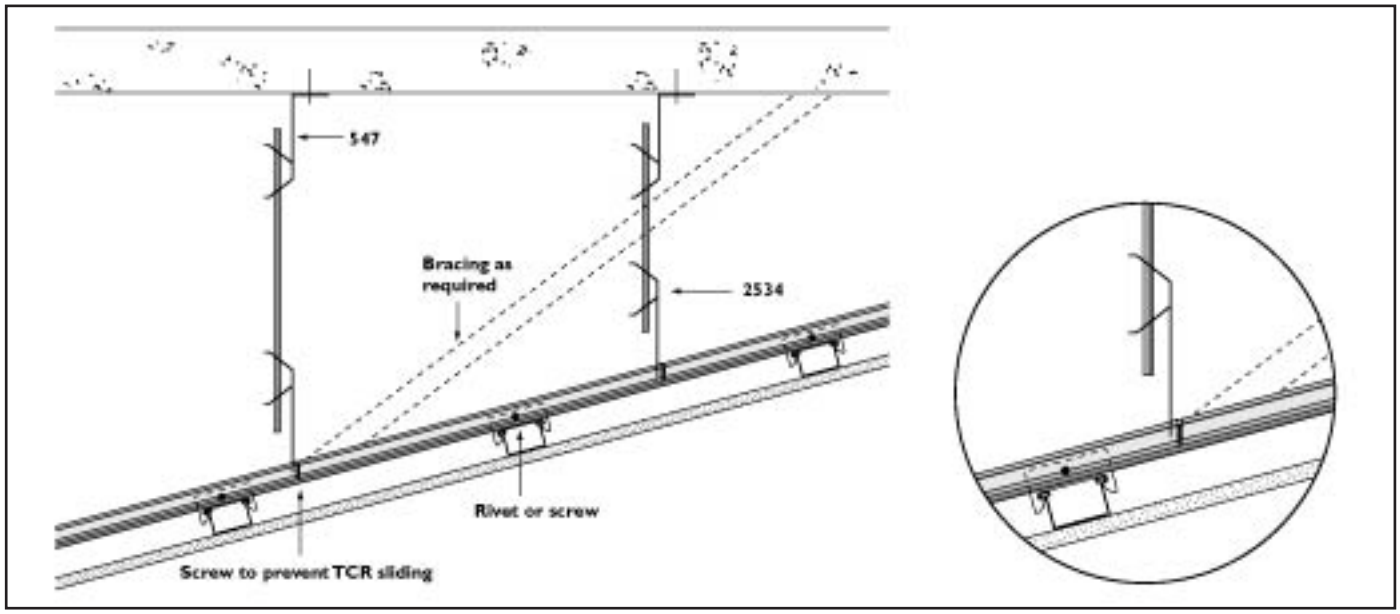


TABLE 2: Maximum Furring Channel Centres for Curved Ceilings

PLASTERBOARD THICKNESS mm	CEILING CURVE RADIUS mm						
	900–1000	1000–1500	1500–2000	2000–2500	2500-3000	3000–4000	4000 +
	MAXIMUM FURRING CHANNEL CENTRES mm						
6.5	150	200	250	300	350	450	550
10	150	200	250	300	350	400	500
13	–	150	200	250	300	400	500
16	–	–	–	–	–	250	350

FOR RAKING & CURVED CEILINGS



FURRING CHANNEL - TOP CROSS RAIL: CANTILEVER DETAILS

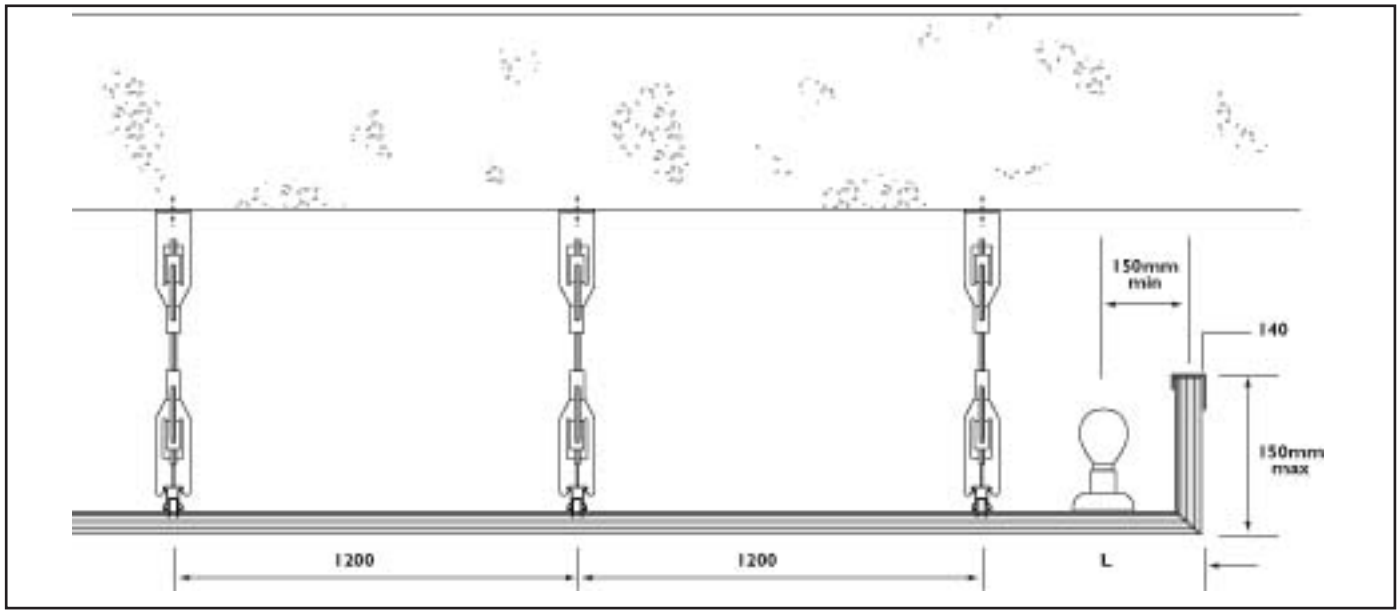


TABLE 3: Maximum Cantilever (L) for One Layer 10/13/16mm Plasterboard

MEMBER	CENTRES mm	L mm
129 Furring Channel	600 450	350 380
308 Furring Channel	600 450	250 270
125 Top Cross Rail	1200 900	250 260
127 Top Cross Rail	1200 900	260 280
128 Top Cross Rail	1200 900	370 420

NOTE:
Maximum upstand to cantilever not to exceed 150mm.
Maximum weight of light fitting not to exceed 5kg/m.
Deflection limited to L/600
Ceiling to be constructed in accordance with the Rondo KEY-LOCK® installation manual
Minimum backspan as shown – reducing the suspension hangers to 900 ctrs does not increase the cantilever.

METAL CEILING BATTENS

DOMESTIC

With new Australian Standards for levels of finish being released, developers are more than ever using Rondo metal ceiling battens as standard procedure.
Metal ceiling batten systems not only allow the developer to meet the new Standard, but also cut back on the cost of call-back maintenance. Rondo have a range of metal ceiling batten systems which are suitable for truss spacings from 600mm to 1200mm and for use in cyclonic and high wind areas. Refer to maximum span and spacing tables for the various ceiling battens.

314 DIRECT FIXING CLIP

To accommodate the increasing use of timber "I" beams, the 314 Direct Fixing Clip has been designed with two extra nail or screw slots placed lower down on the clip, with an additional temporary holding tab to assist installation.
The temporary holding tab is tapped into the timber beam when the clip is at the required level, thus freeing up both hands to permanently secure the clip with nails or screws through the two adjacent fixing slots.

CEILING BATTENS AND DIAPHRAGMS

Ceiling battens that are clipped or suspended are not designed or tested to provide the necessary ceiling diaphragm action required by the code to enable wind forces to be transferred to bracing walls *(refer AS 1684 7.3.3-1 Parts 2-3)*.
Tests have been conducted on Rondo ceiling batten part number 303 by James Cook University to provide a satisfactory diaphragm system when direct fixed.
Contact Rondo state offices for further information.

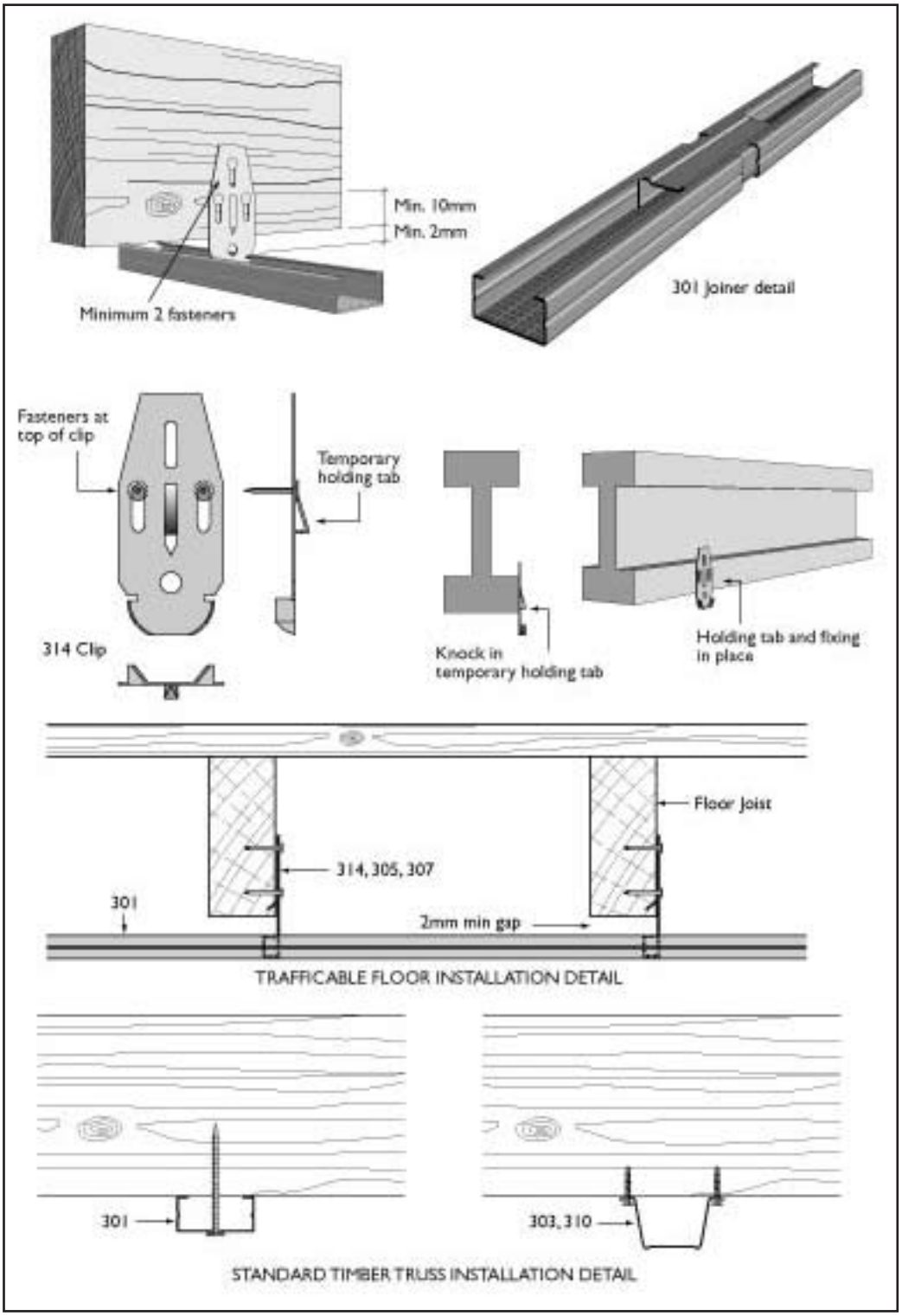


FIGURE 17: Metal Ceiling Battens

IMPORTANT NOTE

Green timber should not come into contact with galvanised steel due to certain acidic substances in the timber which have a corrosive effect on the metallic coating. Some preservative treatments for wood can also have an adverse effect on metallic coated steel with which it is in contact. Timber treated with acidic preservatives of copper chromium arsenic (CCA) can be severely corrosive to the majority of metallic building components. Other timber treatments using Tanalith 'E' *(Tanalised Ecowood)* may cause pitting of the metal coating. If any of the above timber is likely to come into contact with metallic coatings, the steel should be painted for protection. The use of kiln-dried or appropriate dried timber is therefore recommended when metallic coated products are likely to be in contact.

BUTT JOINT STITCHING BATTEN

B005 Butt Joint Stitching Batten developed with the plasterboard industry provides a constant recess shape for finishing when installed as per the plasterboard manufacturer's recommendations. A faster, more cost-effective joint with greater strength can be achieved.

TABLE 4: Fastener Recommendations

BATTEN PART NO.	NAIL LENGTH AND DIAMETER					
	HARDWOOD			SOFTWOOD		
	LENGTH	DIA	TYPE	LENGTH	DIA	TYPE
301	40mm	2.8mm	Annular Ring Shanked	50mm	2.8mm	Annular Ring Shanked
303	30mm	2.8mm	Annular Ring Shanked	40mm	2.8mm	Annular Ring Shanked
310	30mm	2.8mm	Annular Ring Shanked	40mm	2.8mm	Annular Ring Shanked

BATTEN PART NO.	SCREW LENGTH AND SIZE		
	STEEL	HARDWOOD	SOFTWOOD
301	Wafer Head 10 x 24 x 16 Drill Point	Wafer Head 10 x 35 Type 17	Wafer Head 10 x 45 Type 17
303/310	Wafer Head 10 x 24 x 16 Drill Point	Pan Head 8 x 25 Type 17 10 x 25 Wafer	Wafer Head 10 x 45 Type 17

NOTE: Minimum three threads penetration into substrate.

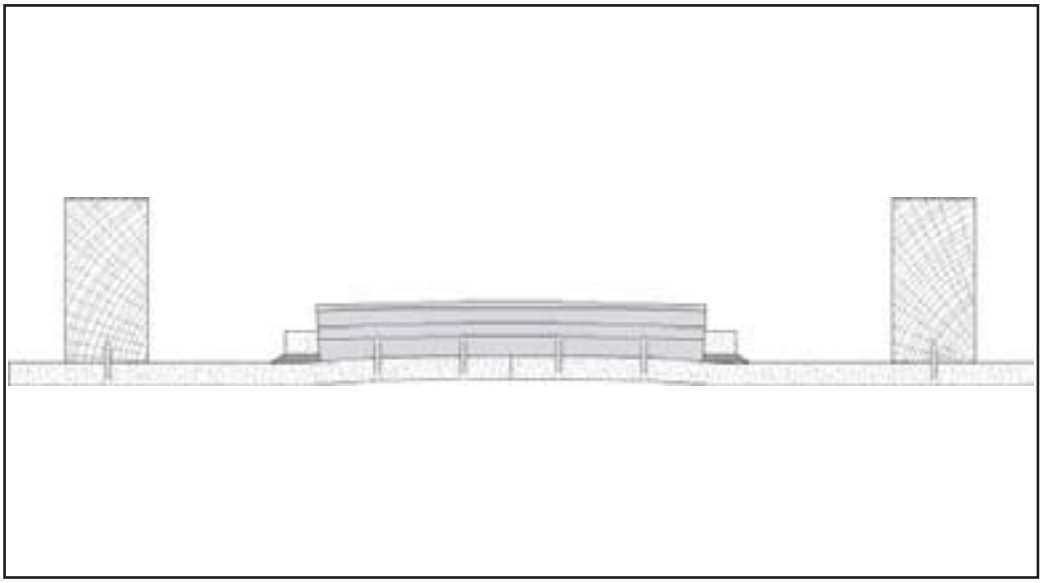


FIGURE 18: Metal Stitching Battens

METAL CEILING BATTENS

(CONTINUED)

MASONRY WALL BATTEN

Rondo furring channels and adjustable anchors are the ideal combination for battening out irregular walls, ready for the fixing of building boards. Furring channels with an adjustable anchor will correct irregular surfaces of 25mm *(refer Figure 19)*. For surfaces which do not require any alignment but require a cavity for cables or plumbing Rondo battens, 301, 310, 333 should be used.

Anchors should be spaced in accordance with Table 5 below. Anchors may be of the adjustable or acoustic type as shown previously, depending on the application.

Masonry fasteners should be selected in accordance with the manufacturer's recommendations.

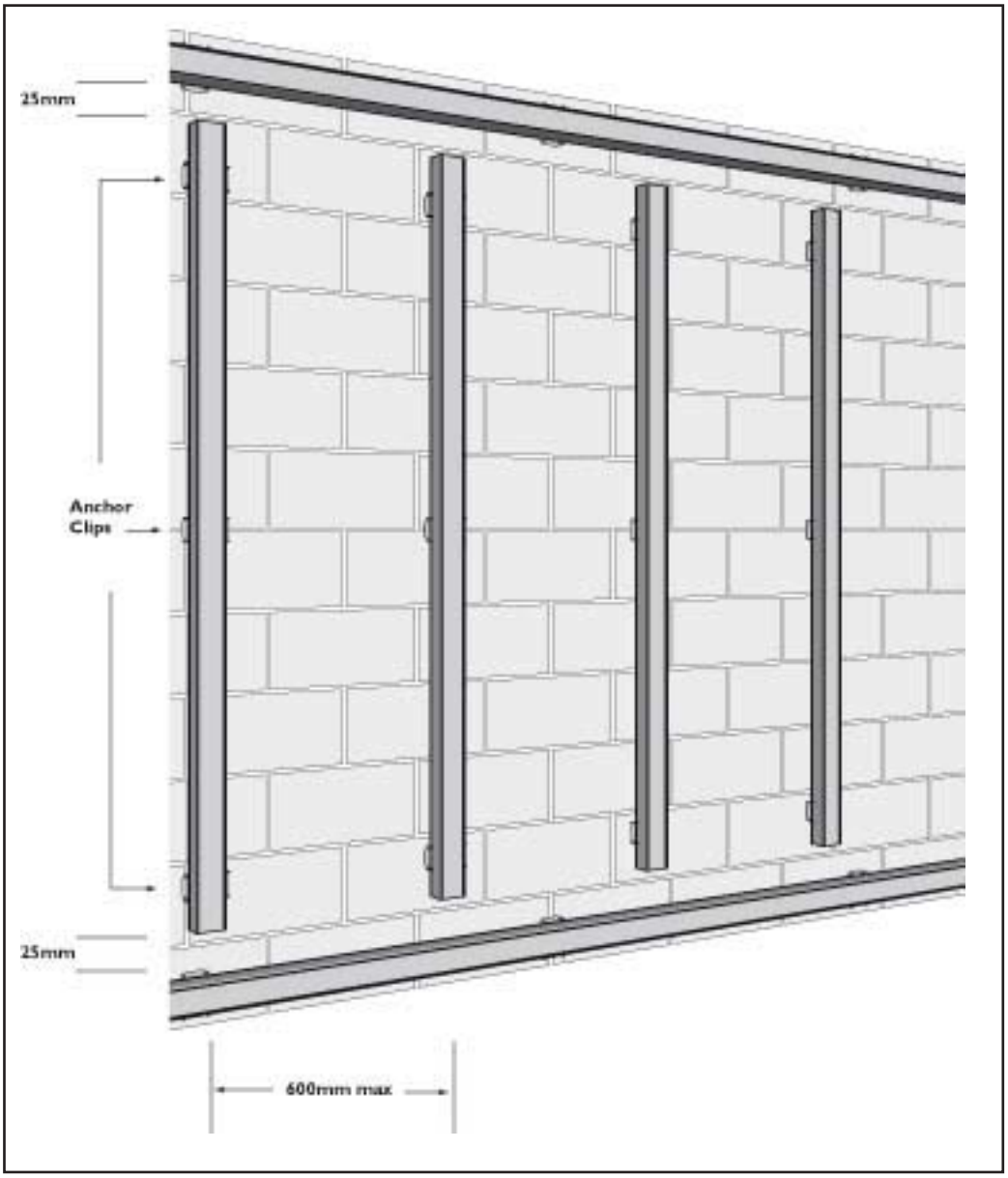


FIGURE 19: MASONRY WALL BATTENS

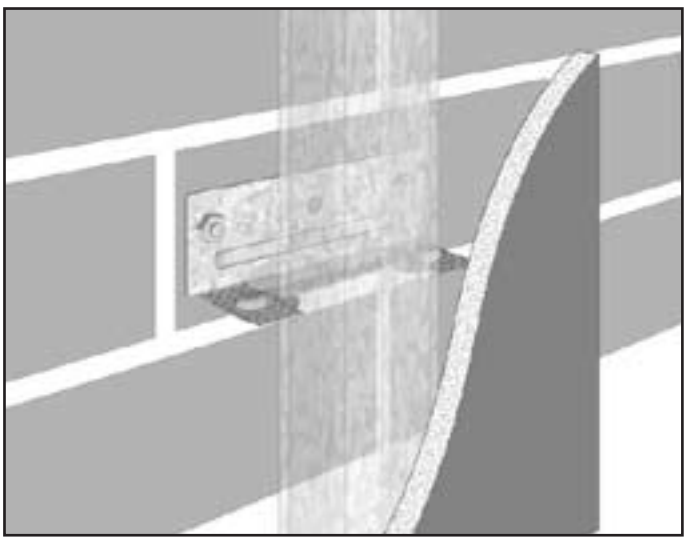


FIGURE 20: INFINITI clip mounted to wall using furring channel

TABLE 5: Maximum Anchor Spacing

FURRING CHANNEL	ANCHOR SPACING (mm
333	900
308	900
129	1200

NOTE:
The above spacings are the maximum recommended installation requirements. This may not be suitable for high traffic areas or external applications.

TOP HAT INSTALLATION

Top hat sections are generally installed to a structural frame which provides the necessary support *(refer Figure 21)*.
In high wind areas, double fasteners at each support may not be adequate. Refer to Table 6 below for guidance on fastener requirements.
The top hat sections need to be accurately set out and levelled prior to installing the nominated finish.
Where expressed joints and Compressed Fibrous Cement (CFC) sheeting is used, the #256 top hat is required to ensure adequate screw edge distances are maintained. The joint set out should be specified by the architect.
Control joints need to be installed and constructed in accordance with the building board manufacturer's recommendations. Control joint spacing, construction and set out are very important for the proper function and performance of the system.

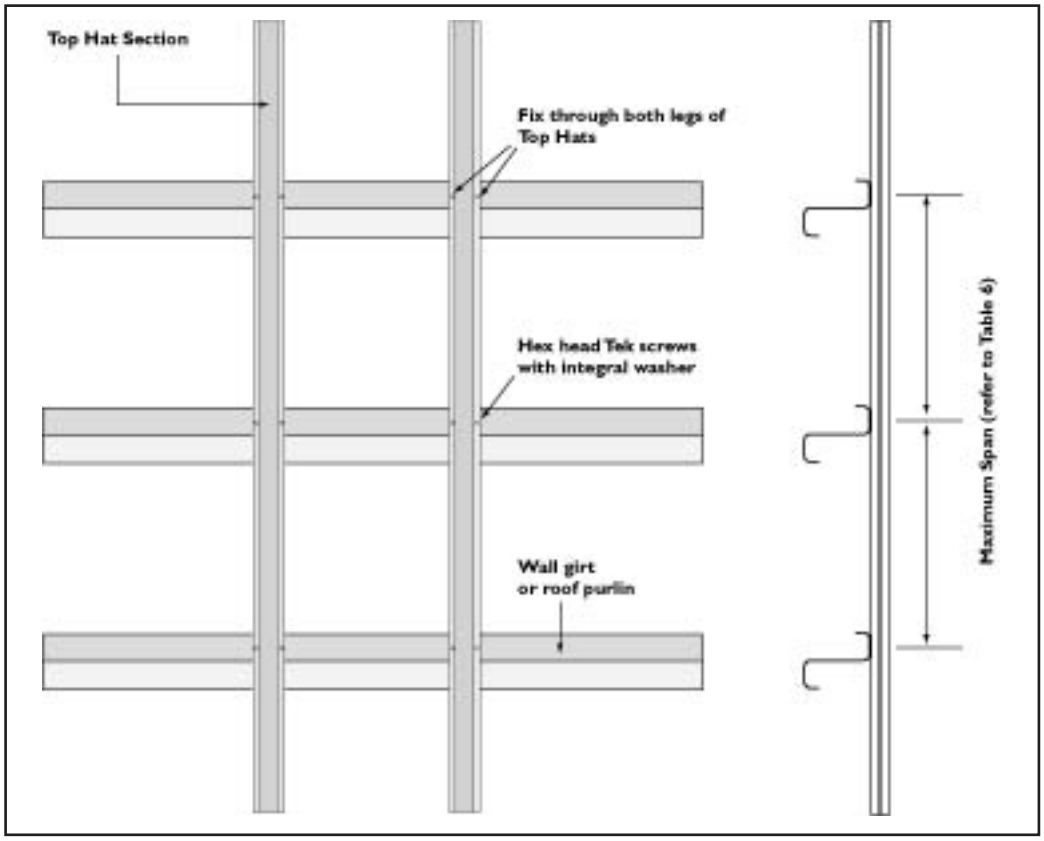


FIGURE 21: TOP HAT INSTALLATION

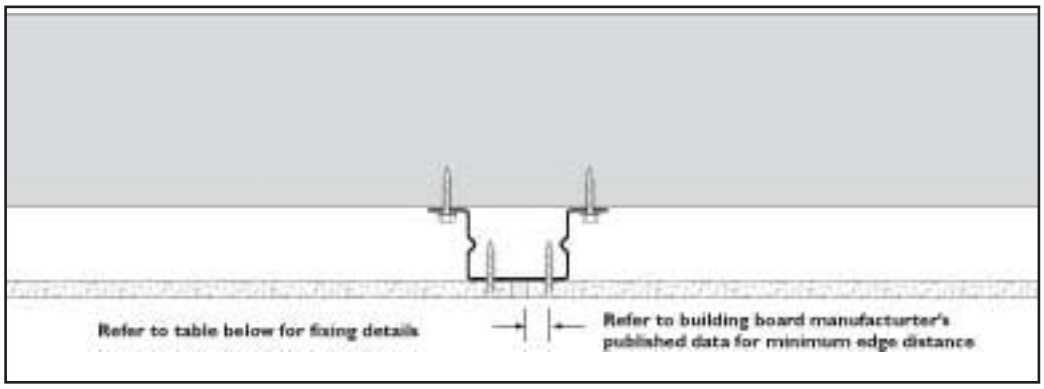


FIGURE 22: FIXING DETAIL

TABLE 6: #12 Hex Head Fasteners

TOP HAT SPAN	TOP HAT SPACING	NO. OF FASTENERS	ULTIMATE WIND LOAD (kPa)
900	600	2	4.80
1200	600	2	3.60
1500	600	2	2.90
1800	600	2	2.40

NOTES:
1. Minimum thickness of supporting structure to be 1.50 BMT, G450 material – i.e. purlin type support.
2. Fastener head/washer diameter to be 12.5mm minimum.
3. All screws to be manufactured in accordance with AS 3566. Screw coating to be selected based on installation requirements and manufacturer's recommendations.

PRODUCT DATA SPECIFICATIONS

FURRING CHANNELS/BATTENS

MATERIAL SPECIFICATIONS
The sections are cold roll formed from steel strip manufactured to AS1397.

Part No's: 129/308/333/310
STEEL GRADE: G2
YIELD STRENGTH:
FY = 270 MPa (typical)
COATING GRADE:
Z275 – 275g/m^2 zinc

Part No's: 301/303
STEEL GRADE: G550
YIELD STRENGTH:
FY = 550 MPa
COATING GRADE:
ZINCALUME AZ150 – 150g/m^2 alum/zinc

BASE METAL THICKNESS:
As specified

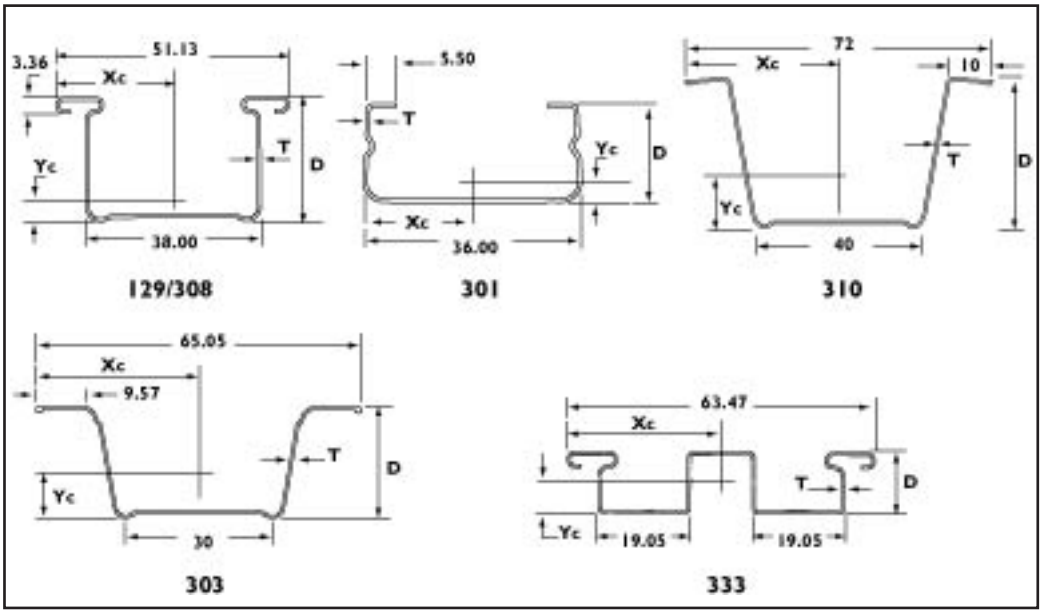


TABLE 7: Furring Channels & Battens – Section Dimensions

RONDO PART NO	AREA mm^2	D mm	T (BMT) mm	Xc mm	Yc mm	YIELD STRESS MPa	SELF-WEIGHT kg/m
129	59.6	27.3	0.50	25.56	13.04	270	0.468
308	48.2	16.0	0.50	25.56	7.70	270	0.378
333	63.2	12.7	0.50	31.74	6.44	270	0.496
301	33.2	16.3	0.42	18.00	5.81	270	0.261
303	45.1	23.5	0.42	32.52	11.48	300	0.354
310	66.0	35.0	0.55	36.00	15.97	270	0.518

TABLE 8: Furring Channels & Battens – Section Properties

RONDO PART NO	MOMENT OF INERTIA 10^3 mm^4		SECTION MODULUS mm^3		RADIUS OF GYRATION mm		TORSION CONSTANT mm^4	WARPING CONSTANT 10^6 mm^6	SHEAR CENTRE mm
	Ixx	Iyy	Zxx	Zyy	Rxx	Ryy	J	Iw	Y_0
129	6.72	18.30	478	711	10.60	17.5	4.97	1.375	-25.20
308	1.74	13.70	216	545	6.01	16.8	4.02	0.368	-12.80
333	1.58	24.20	255	768	5.00	19.6	5.27	0.830	-4.86
301	1.14	6.50	113	366	5.86	14.0	2.24	0.313	-12.72
303	4.03	16.70	336	516	9.46	19.2	2.65	0.467	-18.33
310	11.90	33.50	632	932	13.40	22.5	5.50	1.573	-28.40

NOTES: 1. The above tables list the gross section properties. Any design carried out using these properties needs to be checked in accordance with AS/NZS 4600.
2. Section properties may vary due to manufacturing tolerances, but total material used will not vary.
3. Section capacity calculated based on effective section at yield.

TOP CROSS RAILS

MATERIAL SPECIFICATIONS

The sections are cold roll formed from zinc coated steel strip, which is manufactured to AS1397.

STEEL GRADE: G2

YIELD STRENGTH:
FY = 270 MPA (typical)

COATING GRADE:
Z275 – 275 g/m^2 zinc

BASE METAL THICKNESS:
As specified

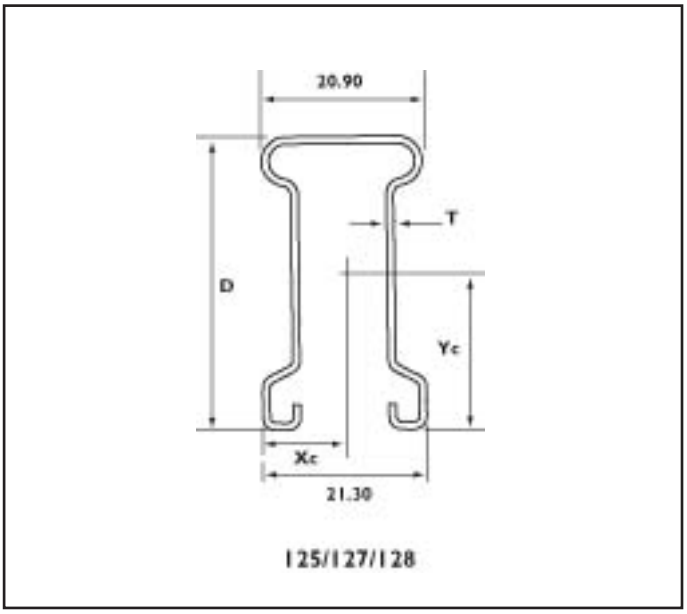


TABLE 9: Top Cross Rails – Section Dimensions

RONDO PART NO	AREA mm^2	D mm	T (BMT) mm	Xc mm	Yc mm	YIELD STRESS MPa	SELF-WEIGHT kg/m
125	48.2	26.35	0.55	10.65	14.18	270	0.378
127	65.7	26.35	0.75	10.65	14.20	270	0.516
128	84.2	38.65	0.75	10.65	20.41	270	0.661

TABLE 10: Top Cross Rails – Section Properties

RONDO PART NO	MOMENT OF INERTIA 10^3 mm^4		SECTION MODULUS mm^3		RADIUS OF GYRATION mm		TORSION CONSTANT mm^4	WARPING CONSTANT 10^6 mm^6	SHEAR CENTRE mm
	Ixx	Iyy	Zxx	Zyy	Rxx	Ryy	J	Iw	Y_0
125	4.12	2.78	299	270	9.25	7.59	4.86	0.228	23.8
127	5.62	3.79	407	369	9.25	7.59	12.30	0.311	23.8
128	15.10	4.51	754	440	13.40	7.32	15.80	0.661	34.6

NOTES: 1. The above tables list the gross section properties. Any design carried out using these properties needs to be checked in accordance with AS/NZS 4600.
2. Section properties may vary due to manufacturing tolerances, but total material used will not vary.
3. Section capacity calculated based on effective section at yield.

PRODUCT DATA SPECIFICATIONS

(CONTINUED)

TOP HAT SECTIONS

MATERIAL SPECIFICATIONS

The sections are cold roll formed from zinc coated steel strip, which is manufactured to AS1397.

STEEL GRADE:
G2

YIELD STRENGTH:
FY = 270 MPA (typical)

COATING GRADE:
Z275 – 275 g/m^2 zinc

BASE METAL THICKNESS:
1.15mm

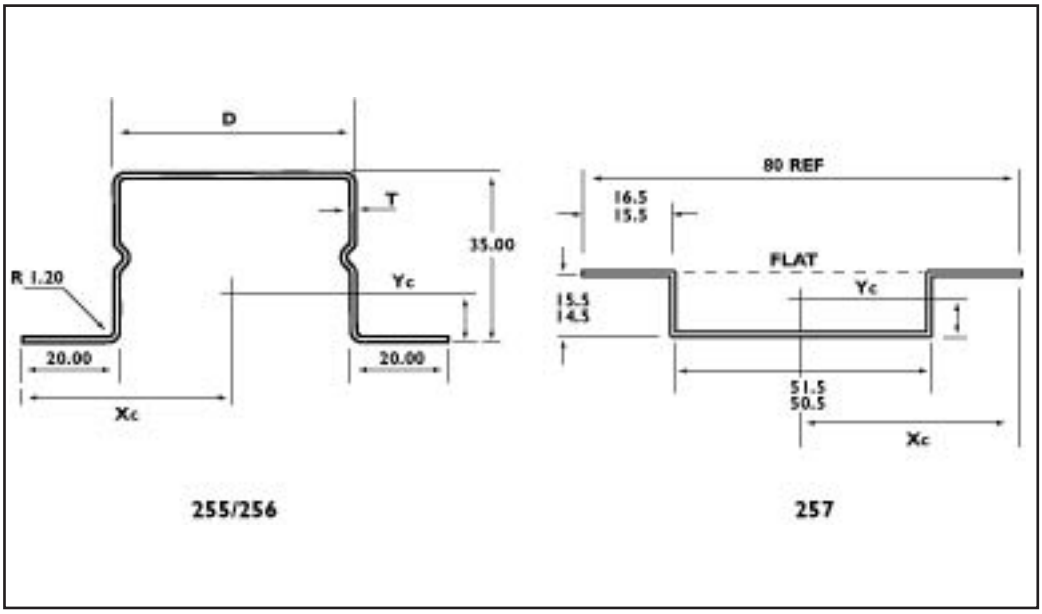


TABLE 11: Top Hat – Section Dimensions

RONDO PART NO	AREA mm^2	D mm	T (BMT) mm	Xc mm	Yc mm	YIELD STRESS MPa	SELF-WEIGHT kg/m
255	174	50.0	1.15	43.85	18.00	270	1.360
256	203	75.0	1.15	56.35	20.30	270	1.590
257	119	51.0	1.15	40.00	8.13	270	0.933

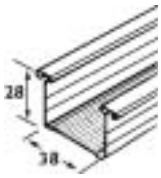
TABLE 12: Top Hat – Section Properties

RONDO PART NO	MOMENT OF INERTIA 10^3 mm^4		SECTION MODULUS mm^3		RADIUS OF GYRATION mm		TORSION CONSTANT mm^4	WARPING CONSTANT 10^6 mm^6	SHEAR CENTRE mm
	Ixx	Iyy	Zxx	Zyy	Rxx	Ryy	J	Iw	Y_0
255	34.70	108.0	1866	2470	14.1	24.9	76.7	9.260	29.2
256	40.90	237.0	1961	4206	14.2	34.1	89.4	22.700	28.6
257	4.50	64.7	517	1625	6.15	23.3	52.4	0.880	11.3

NOTES: 1. The above tables list the gross section properties. Any design carried out using these properties needs to be checked in accordance with AS/NZS 4600.
2. Section properties may vary due to manufacturing tolerances, but total material used will not vary.
3. Section capacity calculated based on effective section at yield.

SPAN TABLES

129 FURRING CHANNEL – DIRECT FIX



For working examples, refer to Appendix A on Page 35.

TABLE 13: Maximum Spans: Wind Loads N2 (0.29 kPa Ult)

CLADDING DETAILS	FURRING CHANNEL SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	1245	1148	1713	1580
1 x 13mm Plasterboard	1213	1119	1670	1540
1 x 16mm Plasterboard	1184	1092	1630	1503
2 x 13mm Plasterboard	1128	1041	1552	1432
2 x 16mm Plasterboard	1088	1004	1498	1381

TABLE 14: Maximum Spans: Wind Loads N3 (0.45 kPa Ult)

CLADDING DETAILS	FURRING CHANNEL SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	1125	1037	1547	1428
1 x 13mm Plasterboard	1105	1018	1519	1401
1 x 16mm Plasterboard	1085	1001	1494	1378
2 x 13mm Plasterboard	1047	965	1440	1328
2 x 16mm Plasterboard	1018	938	1400	1292

NOTE: 1. Wind loading to AS 4055 as follows: **N2** :V_{hu} = 40m/s V_{hs} = 26m/s C_{pi}=-0.3. Previously W33.
N3 :V_{hu} = 50m/s V_{hs} = 32m/s C_{pi}=-0.3. Previously W41.

2. Ultimate limit state: **LC1**: 1.2G + Wu
3. Serviceability limit states: **LC2**: G - Limit L/600 to AS 3623 **LC3**: G + Ws - Limit L/200 to AS 1170.0

TABLE 15: Maximum Spans: Wind Loads 0.50 kPa — 1.00 kPa

CLADDING DETAILS	FURRING CHANNEL SPACING							
	0.50 kPa				0.60 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	1097	1011	1510	1392	1049	967	1443	1331
1 x 13mm Plasterboard	1078	995	1484	1369	1034	954	1423	1312
1 x 16mm Plasterboard	1062	979	1461	1347	1020	941	1403	1295
2 x 13mm Plasterboard	1026	946	1412	1302	990	913	1362	1256
2 x 16mm Plasterboard	999	922	1375	1269	967	892	1331	1228

CLADDING DETAILS	0.70 kPa				0.80 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	1009	931	1389	1281	976	900	1343	1239
1 x 13mm Plasterboard	997	919	1372	1265	965	890	1328	1225
1 x 16mm Plasterboard	985	908	1355	1250	955	880	1314	1212
2 x 13mm Plasterboard	959	885	1320	1217	932	860	1283	1183
2 x 16mm Plasterboard	940	866	1293	1192	915	844	1259	1161

CLADDING DETAILS	0.90 kPa				1.00 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	947	873	1302	1202	922	850	1268	1170
1 x 13mm Plasterboard	937	865	1290	1190	913	842	1257	1159
1 x 16mm Plasterboard	928	856	1278	1178	905	835	1246	1149
2 x 13mm Plasterboard	908	838	1250	1153	887	818	1221	1126
2 x 16mm Plasterboard	893	824	1229	1133	873	806	1202	1108

NOTE: 1. Stated pressure is the ultimate design wind load, including all local factors.
2. Deflection limited to the lesser of L/600 under dead load, or L/200 under dead plus service wind load.
3. Service wind load checked at 0.65 times the ultimate pressure.
4. Strength check of unrestrained flange in compression.
5. Connections to be independently checked.

SPAN TABLES

(CONTINUED)

308 FURRING CHANNEL – DIRECT FIX

For working examples, refer to Appendix A on Page 35.

TABLE 16: Maximum Spans: Wind Loads N2 (0.29 kPa Ult)

CLADDING DETAILS	FURRING CHANNEL SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	1018	933	1384	1269
1 x 13mm Plasterboard	990	907	1359	1245
1 x 16mm Plasterboard	965	885	1324	1215
2 x 13mm Plasterboard	915	840	1170	1095
2 x 16mm Plasterboard	881	808	1094	1027

TABLE 17: Maximum Spans: Wind Loads N3 (0.45 kPa Ult)

CLADDING DETAILS	FURRING CHANNEL SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	913	837	1253	1149
1 x 13mm Plasterboard	895	821	1228	1126
1 x 16mm Plasterboard	878	806	1206	1106
2 x 13mm Plasterboard	845	775	1160	1064
2 x 16mm Plasterboard	820	752	1094	1027

NOTE: 1. Wind loading to AS 4055 as follows: **N2** :V_{hu} = 40m/s V_{hs} = 26m/s C_{pi}=-0.3. Previously W33.
N3 :V_{hu} = 50m/s V_{hs} = 32m/s C_{pi}=-0.3. Previously W41.

2. Ultimate limit state: **LC1**: 1.2G + Wu

3. Serviceability limit states: **LC2**: G - Limit L/600 to AS 3623 **LC3**: G + Ws - Limit L/200 to AS 1170.0

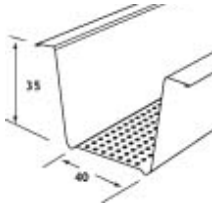
TABLE 18: Maximum Spans: Wind Loads 0.20 kPa, 0.30 kPa, 0.40 kPa, 0.50 kPa

CLADDING DETAILS	FURRING CHANNEL SPACING							
	0.20 kPa				0.30 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	1104	1012	1444	1317	1008	925	1320	1202
1 x 13mm Plasterboard	1065	976	1460	1340	981	900	1347	1235
1 x 16mm Plasterboard	1031	946	1415	1298	958	877	1313	1205
2 x 13mm Plasterboard	968	888	1328	1218	909	835	1249	1145
2 x 16mm Plasterboard	925	848	1268	1163	876	803	1202	1102

CLADDING DETAILS	0.40 kPa				0.50 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	940	863	1229	1119	888	815	1160	1055
1 x 13mm Plasterboard	920	844	1263	1158	872	800	1198	1098
1 x 16mm Plasterboard	901	827	1238	1135	858	787	1177	1080
2 x 13mm Plasterboard	864	792	1185	1088	827	758	1135	1042
2 x 16mm Plasterboard	837	767	1149	1053	805	738	1105	1003

NOTE: 1. Stated pressure is the ultimate design wind load, including all local factors.
2. Deflection limited to the lesser of L/600 under dead load, or L/200 under dead plus service wind load.
3. Service wind load checked at 0.65 times the ultimate pressure.
4. Strength check of unrestrained flange in compression.
5. Connections to be independently checked.

310 BATTEN – DIRECT FIX



For working examples, refer to Appendix A on Page 35.

TABLE 19: Maximum Spans: Wind Loads N2 (0.29 kPa Ult)

CLADDING DETAILS	BATTEN SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	1197	1101	1645	1513
1 x 13mm Plasterboard	1166	1072	1602	1473
1 x 16mm Plasterboard	1137	1046	1563	1438
2 x 13mm Plasterboard	1081	995	1486	1368
2 x 16mm Plasterboard	1042	959	1432	1318

TABLE 20: Maximum Spans: Wind Loads N3 (0.45 kPa Ult)

CLADDING DETAILS	BATTEN SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	1078	992	1482	1363
1 x 13mm Plasterboard	1058	973	1454	1337
1 x 16mm Plasterboard	1039	956	1428	1314
2 x 13mm Plasterboard	1001	921	1375	1265
2 x 16mm Plasterboard	972	894	1337	1230

NOTE: 1. Wind loading to AS 4055 as follows: **N2** :V_{hu} = 40m/s V_{hs} = 26m/s C_{pi}=-0.3. Previously W33.
N3 :V_{hu} = 50m/s V_{hs} = 32m/s C_{pi}=-0.3. Previously W41.

2. Ultimate limit state: **LC1**: 1.2G + Wu

3. Serviceability limit states: **LC2**: G - Limit L/600 to AS 3623 **LC3**: G + Ws - Limit L/200 to AS 1170.0

TABLE 21: Maximum Spans: Wind Loads 0.50 kPa — 1.00 kPa

CLADDING DETAILS	BATTEN SPACING							
	0.50 kPa				0.60 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	1050	966	1443	1328	1003	923	1379	1268
1 x 13mm Plasterboard	1032	949	1419	1305	988	909	1359	1249
1 x 16mm Plasterboard	1015	934	1396	1284	975	896	1339	1232
2 x 13mm Plasterboard	980	902	1347	1240	945	869	1299	1195
2 x 16mm Plasterboard	954	878	1312	1207	923	849	1268	1167

CLADDING DETAILS	0.70 kPa				0.80 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	964	887	1325	1219	931	857	1280	1178
1 x 13mm Plasterboard	952	875	1308	1204	921	847	1265	1164
1 x 16mm Plasterboard	940	865	1292	1189	911	837	1250	1151
2 x 13mm Plasterboard	915	841	1257	1156	888	817	1220	1123
2 x 16mm Plasterboard	895	824	1231	1132	871	802	1197	1102

CLADDING DETAILS	0.90 kPa				1.00 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	903	830	1240	1141	878	807	1206	1110
1 x 13mm Plasterboard	893	822	1228	1130	869	800	1195	1099
1 x 16mm Plasterboard	885	814	1215	1119	860	793	1184	1089
2 x 13mm Plasterboard	865	796	1189	1094	844	777	1160	1067
2 x 16mm Plasterboard	850	782	1168	1075	830	764	1141	1050

NOTE: 1. Stated pressure is the ultimate design wind load, including all local factors.
2. Deflection limited to the lesser of L/600 under dead load, or L/200 under dead plus service wind load.
3. Service wind load checked at 0.65 times the ultimate pressure.
4. Strength check of unrestrained flange in compression.
5. Connections to be independently checked.

SPAN TABLES

(CONTINUED)

301 BATTEN – DIRECT FIX

TABLE 22: 301 Batten – Maximum Spans: Wind Loads N2 (0.29 kPa Ult)

CLADDING DETAILS	BATTEN SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	950	900	1200	1200
1 x 13mm Plasterboard	950	900	1200	1200

TABLE 23: 301 Batten – Maximum Spans: Wind Loads N3 (0.45 kPa Ult)

CLADDING DETAILS	BATTEN SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	900	800	1200	1120
1 x 13mm Plasterboard	900	800	1200	1100

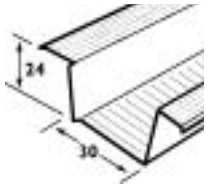
NOTE: 1. Wind loading to AS 4055 as follows: **N2** :V_{hu} = 40m/s V_{hs} = 26m/s C_{pi}=-0.3. Previously W33.
N3 :V_{hu} = 50m/s V_{hs} = 32m/s C_{pi}=-0.3. Previously W41.

2. Ultimate limit state: **LC1**: 1.2G + Wu

3. Serviceability limit states: **LC2**: G - Limit L/600 to AS 3623 **LC3**: G + Ws - Limit L/200 to AS 1170.0

For working examples, refer to Appendix A on Page 35.

303 CYCLONIC BATTEN – DIRECT FIX



For working examples, refer to Appendix A on Page 35.

TABLE 24: Maximum Spans: Wind Loads N2 (0.29 kPa Ult)

CLADDING DETAILS	FURRING CHANNEL SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	945	871	1300	1200
1 x 13mm Plasterboard	920	850	1267	1168
1 x 16mm Plasterboard	900	830	1237	1141
2 x 13mm Plasterboard	856	790	1179	1087
2 x 16mm Plasterboard	826	762	1137	1049

TABLE 25: Maximum Spans: Wind Loads N3 (0.45 kPa Ult)

CLADDING DETAILS	FURRING CHANNEL SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
1 x 10mm Plasterboard	854	787	1175	1084
1 x 13mm Plasterboard	838	773	1154	1064
1 x 16mm Plasterboard	824	760	1134	1046
2 x 13mm Plasterboard	795	733	1093	1009
2 x 16mm Plasterboard	773	713	1063	981

NOTE: 1. Wind loading to AS 4055 as follows: **N2** :V_{hu} = 40m/s V_{hs} = 26m/s C_{pi}=-0.3. Previously W33.
N3 :V_{hu} = 50m/s V_{hs} = 32m/s C_{pi}=-0.3. Previously W41.

2. Ultimate limit state: **LC1**: 1.2G + Wu

3. Serviceability limit states: **LC2**: G - Limit L/600 to AS 3623 **LC3**: G + Ws - Limit L/200 to AS 1170.0

TABLE 26: Maximum Spans: Wind Loads 0.50 kPa — 1.00 kPa

CLADDING DETAILS	FURRING CHANNEL SPACING							
	0.50 kPa				0.60 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	833	767	1145	1057	796	735	1095	1010
1 x 13mm Plasterboard	819	755	1128	1039	784	724	1081	996
1 x 16mm Plasterboard	805	743	1109	1022	774	714	1066	983
2 x 13mm Plasterboard	779	719	1073	989	752	694	1035	955
2 x 16mm Plasterboard	759	700	1045	963	735	678	1010	933

CLADDING DETAILS	0.70 kPa				0.80 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	766	707	1055	973	741	684	1020	941
1 x 13mm Plasterboard	756	699	1042	961	733	676	1009	931
1 x 16mm Plasterboard	747	690	1030	950	725	669	998	920
2 x 13mm Plasterboard	729	672	1003	925	708	653	975	899
2 x 16mm Plasterboard	714	658	982	906	695	641	956	883

CLADDING DETAILS	0.90 kPa				1.00 kPa			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
1 x 10mm Plasterboard	719	664	990	913	700	646	963	888
1 x 13mm Plasterboard	712	657	980	904	694	640	955	881
1 x 16mm Plasterboard	705	650	970	895	687	634	946	873
2 x 13mm Plasterboard	690	637	950	877	674	622	927	856
2 x 16mm Plasterboard	679	626	933	862	664	612	913	842

NOTE: 1. Stated pressure is the ultimate design wind load, including all local factors.
2. Deflection limited to the lesser of L/600 under dead load, or L/200 under dead plus service wind load.
3. Service wind load checked at 0.65 times the ultimate pressure.
4. Strength check of unrestrained flange in compression.
5. Connections to be independently checked.

SPAN TABLES

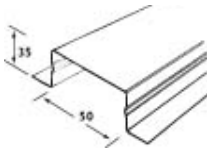
(CONTINUED)

TOP HAT SECTIONS – ULTIMATE LIMIT STATE

TABLE 27: Part Number 255: Ultimate Limit State Load Capacity (kPa)

SPAN	#255 TOP HAT SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
900	7.48	5.61	8.58	6.44
1000	5.66	4.24	6.78	5.09
1100	4.32	3.24	5.33	4.00
1200	3.32	2.49	4.31	3.23
1300	2.53	1.89	3.59	2.69
1400	1.96	1.47	2.89	2.16
1500	1.55	1.16	2.42	1.82
1600	1.25	0.94	2.02	1.52
1700	1.02	0.77	1.66	1.24
1800	0.85	0.64	1.40	1.05

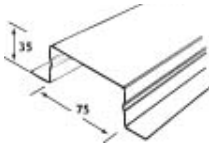
For working examples, refer to Appendix A on Page 35.



255

TABLE 28: Part Number 256: Ultimate Limit State Load Capacity (kPa)

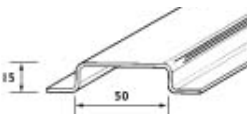
SPAN	#256 TOP HAT SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
900	8.95	6.71	9.58	7.18
1000	6.99	5.24	7.60	5.70
1100	5.54	4.16	6.19	4.64
1200	4.45	3.33	5.03	3.78
1300	3.60	2.70	4.21	3.16
1400	2.93	2.20	3.49	2.62
1500	2.40	1.80	2.98	2.23
1600	1.97	1.48	2.50	1.88
1700	1.60	1.20	2.16	1.62
1800	1.30	0.98	1.83	1.37



256

TABLE 29: Part Number 257: Ultimate Limit State Load Capacity (kPa)

SPAN	#257 TOP HAT SPACING			
	SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600
600	4.99	3.74	5.62	4.22
650	4.09	3.06	4.66	3.49
700	3.38	2.54	3.98	2.98
750	2.83	2.12	3.33	2.50
800	2.39	1.79	2.81	2.11
850	2.03	1.53	2.39	1.79
900	1.75	1.31	2.09	1.57
1000	1.32	0.99	1.59	1.19
1100	1.02	0.76	1.26	0.95
1200	0.81	0.61	0.98	0.74



257

NOTE: 1. Ultimate limit state load capacity to be calculated in accordance with AS/NZS 1170.0 or AS/NZS 1170.2 as applicable.
2. Connections to be independently checked.
3. Serviceability limit state to be checked using Tables 30, 31 and 32 respectively.
4. Lining contribution has been ignored in analysis.

TOP HAT SECTIONS – SERVICEABILITY LIMIT STATE

TABLE 30: Part Number 255: Serviceability Limit State Load Capacity (kPa)

SPAN	#255 TOP HAT SPACING							
	L/250 DEFLECTION LIMIT				L/360 DEFLECTION LIMIT			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
900	6.51	4.88	12.28	9.21	4.52	3.39	8.53	6.40
1000	4.74	3.56	8.95	6.71	3.29	2.47	6.22	4.66
1100	3.56	2.67	6.73	5.05	2.48	1.86	4.67	3.50
1200	2.75	2.06	5.18	3.89	1.91	1.43	3.60	2.70
1300	2.16	1.62	4.08	3.06	1.50	1.12	2.83	2.12
1400	1.73	1.30	3.26	2.45	1.20	0.90	2.27	1.70
1500	1.41	1.05	2.65	1.99	0.98	0.73	1.84	1.38
1600	1.16	0.87	2.19	1.64	0.80	0.60	1.52	1.14
1700	0.97	0.72	1.82	1.37	0.67	0.50	1.27	0.95
1800	0.81	0.61	1.54	1.15	0.56	0.42	1.07	0.80

TABLE 31: Part Number 256: Serviceability Limit State Load Capacity (kPa)

SPAN	#256 TOP HAT SPACING							
	L/250 DEFLECTION LIMIT				L/360 DEFLECTION LIMIT			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
900	7.66	5.75	14.46	10.84	5.32	3.99	10.04	7.53
1000	5.59	4.19	10.54	7.91	3.88	2.91	7.32	5.49
1100	4.20	3.15	7.92	5.94	2.91	2.19	5.50	4.12
1200	3.23	2.42	6.10	4.57	2.24	1.68	4.24	3.18
1300	2.54	1.91	4.80	3.60	1.77	1.32	3.33	2.50
1400	2.04	1.53	3.84	2.88	1.41	1.06	2.67	2.00
1500	1.65	1.24	3.12	2.34	1.15	0.86	2.17	1.63
1600	1.36	1.02	2.57	1.93	0.95	0.71	1.79	1.34
1700	1.14	0.85	2.15	1.61	0.79	0.59	1.49	1.12
1800	0.96	0.72	1.81	1.36	0.67	0.50	1.26	0.94

TABLE 32: Part Number 257: Serviceability Limit State Load Capacity (kPa)

SPAN	#257 TOP HAT SPACING							
	L/250 DEFLECTION LIMIT				L/360 DEFLECTION LIMIT			
	SINGLE SPAN		CONTINUOUS SPAN		SINGLE SPAN		CONTINUOUS SPAN	
	450	600	450	600	450	600	450	600
600	2.85	2.13	5.37	4.03	1.98	1.48	3.73	2.80
650	2.24	1.68	4.22	3.17	1.55	1.17	2.93	2.20
700	1.79	1.34	3.38	2.54	1.24	0.93	2.35	1.76
750	1.46	1.09	2.75	2.06	1.01	0.76	1.91	1.43
800	1.20	0.90	2.27	1.70	0.83	0.63	1.57	1.18
850	1.00	0.75	1.89	1.42	0.70	0.52	1.31	0.98
900	0.84	0.63	1.59	1.19	0.59	0.44	1.10	0.83
1000	0.61	0.46	1.16	0.87	0.43	0.32	0.81	0.60
1100	0.46	0.35	0.87	0.65	0.32	0.24	0.61	0.45
1200	0.36	0.27	0.67	0.50	0.25	0.19	0.47	0.35

NOTE: 1. Serviceability limit state load capacity to be calculated in accordance with AS/NZS 1170.0 or AS/NZS 1170.2 as applicable.
2. Connections to be independently checked.
3. Ultimate limit state to be checked using Tables 27, 28 and 29 respectively.
4. Lining contribution has been ignored in analysis.
5. Cantilever not to exceed 0.2 times the backspan.

LOAD TABLES

125 TOP CROSS RAIL

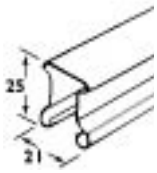


TABLE 33: Maximum Ceiling Load – Span of Top Cross Rail: 900mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	49	41	49	30
1200	36	15	36	11
1500	21	6.4	15	4.1
1800	9.1	–	5.9	–

TABLE 34: Maximum Ceiling Load – Span of Top Cross Rail: 1200mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	19	19	19	19
1200	13	13	13	11
1500	10	6.4	10	4.1
1800	7.9	–	5.9	–

TABLE 35: Maximum Ceiling Load – Span of Top Cross Rail: 1500mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	8.1	8.1	8.1	8.1
1200	5.2	5.2	5.2	5.2
1500	3.4	3.4	3.4	3.4
1800	–	–	–	–

NOTE: 1. The above tables give the allowable dead load for the various ceiling configurations. The calculated ceiling weight therefore does not have to be factored in accordance with AS/NZS 2785.
2. Connections to be independently checked.
3. Deflection limited to L/360.
4. Lining contribution has been ignored in analysis.
5. Refer to details on Page 11 for external suspended ceiling systems.
6. Ultimate limit state: 1.4G + 1.7U. Serviceability limit state: G + U.

For working examples, refer to Appendix A on Page 35.

127 TOP CROSS RAIL

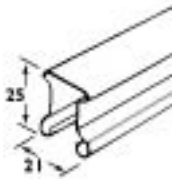


TABLE 36: Maximum Ceiling Load – Span of Top Cross Rail: 900mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	67	41	67	30
1200	50	15	37	11
1500	21	6.4	15	4.1
1800	9.1	–	5.9	–

TABLE 37: Maximum Ceiling Load – Span of Top Cross Rail: 1200mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	27	27	27	27
1200	19	15	19	11
1500	15	6.4	15	4.1
1800	9.1	–	5.9	–

TABLE 38: Maximum Ceiling Load – Span of Top Cross Rail: 1500mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	12	12	12	12
1200	8.4	8.4	8.4	8.4
1500	6.1	6.1	6.1	4.1
1800	4.6	–	4.6	–

NOTE: 1. The above tables give the allowable dead load for the various ceiling configurations. The calculated ceiling weight therefore does not have to be factored in accordance with AS/NZS 2785.
2. Connections to be independently checked.
3. Deflection limited to L/360.
4. Lining contribution has been ignored in analysis.
5. Refer to details on Page 11 for external suspended ceiling systems.
6. Ultimate limit state: 1.4G + 1.7U. Serviceability limit state: G + U.

For working examples, refer to Appendix A on Page 35.

LOAD TABLES

(CONTINUED)

128 TOP CROSS RAIL

TABLE 39: Maximum Ceiling Load – Span of Top Cross Rail: 1200mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	50	41	50	30
1200	37	15	37	11
1500	21	6.4	15	4.1
1800	9.1	–	5.9	–

TABLE 40: Maximum Ceiling Load – Span of Top Cross Rail: 1500mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	22	22	22	22
1200	16	15	16	11
1500	12	6.4	15	4.1
1800	9.1	–	5.9	–

TABLE 41: Maximum Ceiling Load – Span of Top Cross Rail: 1800mm

SPACING OF TOP CROSS RAIL	FURRING CHANNEL SPACING			
	450		600	
	ALLOWABLE CEILING WEIGHT kg/m^2			
	129 FURRING CHANNEL	308 FURRING CHANNEL	129 FURRING CHANNEL	308 FURRING CHANNEL
900	10	10	10	10
1200	7	7	7	7
1500	5	5	5	5
1800	3	–	3	–

NOTE: 1. The above tables give the allowable dead load for the various ceiling configurations. The calculated ceiling weight therefore does not have to be factored in accordance with AS/NZS 2785.
2. Connections to be independently checked.
3. Deflection limited to L/360.
4. Lining contribution has been ignored in analysis.
5. Refer to details on Page 11 for external suspended ceiling systems.
6. Ultimate limit state: 1.4G + 1.7U. Serviceability limit state: G + U.

For working examples, refer to Appendix A on Page 35.

APPENDIX A

WORKING EXAMPLES

Following are working examples for the span and load tables starting on Page 25 of this brochure.

TABLE 13
Example:
Residential house located in Region A
Terrain Category 2.5
Topographic location T1
Partial shielding (PS)
From AS4055:Wind Loading - N2
Select preferred option depending on linings and span

TABLE 14
Example:
Residential house located in Region B
Terrain Category 3
Topographic location T2
Partial shielding (PS)
From AS4055:Wind Loading - N3
Select preferred option depending on linings and span

TABLE 15
Example:
1 x 13mm plasterboard, and the engineer has given a wind loading of 0.68kPa positive or negative
Using the 0.70kPa table, adopt #129 Furring Channel at 600mm centres - maximum span = 1265mm continuous.

TABLE 16
Example:
Residential house located in Region A
Terrain Category 2.5
Topographic location T1
Partial shielding (PS)
From AS4055:Wind Loading - N2
Select preferred option depending on linings and span

TABLE 17
Example:
Residential house located in Region B
Terrain Category 3
Topographic location T2
Partial shielding (PS)
From AS4055:Wind Loading - N3
Select preferred option depending on linings and span

TABLE 18
Example:
1 x 16mm plasterboard, and the engineer has given a wind loading of 0.48kPa positive or negative
Using the 0.50kPa table, adopt #308 Furring Channel at 450mm centres – maximum span = 1177mm continuous.

TABLE 19
Example:
Residential house located in Region A
Terrain Category 2.5
Topographic location T1
Partial shielding (PS)
From AS4055:Wind Loading - N2
Select preferred option depending on linings and span

TABLE 20
Example:
Residential house located in Region B
Terrain Category 3
Topographic location T2
Partial shielding (PS)
From AS4055:Wind Loading - N3
Select preferred option depending on linings and span

TABLE 21
Example:
2 x 13mm plasterboard, and the engineer has given a wind loading of 0.80kPa positive or negative
Using the 0.80kPa table, adopt #310 Battens at 450mm centres – maximum span = 1220mm continuous.

TABLE 24
Example:
Residential house located in Region A
Terrain Category 2.5
Topographic location T1
Partial shielding (PS)
From AS4055:Wind Loading - N2
Select preferred option depending on linings and span

TABLE 25
Example:
Residential house located in Region B
Terrain Category 3
Topographic location T2
Partial shielding (PS)
From AS4055:Wind Loading - N3
Select preferred option depending on linings and span

TABLE 26
Example:
1 x 10mm plasterboard, and the engineer has given a wind loading of 0.45kPa positive or negative
Using the 0.50kPa table, adopt #303 Battens at 600mm centres – maximum span = 1057mm continuous.

TABLES 27, 28, 29
Example:
Dead Load - 1 x 9mm FC sheeting – 0.18kPa
Wind Load to AS/NZS1170.2:
Using Appendix D4
Region B Terrain category 3
Height of soffit = 12m
Projection of soffit = 6m
Building Height = 18m
V_{1000} = 60m/s
V_{20} = 38m/s
Direction Multiplier M_D = 1
Terrain/Height Multiplier M_{zcat3} = 0.92
Shielding/Topography
Ms Mt = 1.0
$V_{des\theta}$ = 55.2m/s Ultimate
θ = 0 degrees only:
hc / h = 0.67, and hc/wc = 0.5
Cpn = +0.44 or -0.37
Area reduction Ka = 1.0
Local pressure factor
Kl = 1.5, 2.0 or 3.0 - Upward
Maximum Negative:
pu = 0.6 x $(55.2)^2$ x -0.37 x 2.0 = 1.35kPa Downward
Maximum Positive:
pu = 0.6 x $(55.2)^2$ x 0.44 x 3.0 = 2.41kPa Upward

Check Load Combinations to AS/NZS1170.0
LC1: 1.35G
W* = 1.35 x 0.18 = 0.243kPa
LC2: 1.2G, 1.5Q
Q = 0kPa for ceiling, therefore 1.2G not critical

LC3: 1.2G,Wu, ψ_cQ
Q = 0kPa for ceiling, therefore 1.2G,Wu
Downward:
W* = (1.2 x 0.18) + 1.35
= 1.57 kPa

LC4: 0.9G,Wu, ψ_cQ
Q = 0kPa for ceiling, therefore 0.9G,Wu
Upward:
W* = (0.9 x 0.18) - 2.41
= 2.25 kPa
Therefore, W* = 2.25kPa controls
Top hat continuous span
Adopt #255 at 600 ctrs – maximum span = 1300mm
Adopt #256 at 600 ctrs – maximum span = 1400mm
* Check serviceability Page 31

APPENDIX A

(CONTINUED)

WORKING EXAMPLES

TABLES 30, 31, 32

Check serviceability of previous example

External soffit therefore adopt L / 360 under dead load and L / 250 under wind load as deflection limits.

Wind loading:

Maximum Negative ps = 1.35 x (38/60)2 = 0.54kPa

Maximum Positive ps = 2.41 x (38/60)2 = 0.97kPa

From Previous #255 at 600 ctrs – maximum span = 1300mm

L / 360 Limit W* = 2.12kPa > 0.18kPa OK

L / 250 Limit W* = 3.06kPa > 0.81kPa OK

From previous #256 at 600 ctrs – maximum span = 1400mm

L / 360 Limit W* = 2.00kPa > 0.18kPa OK

L / 250 Limit W* = 2.88kPa > 0.81kPa OK

Both sections satisfy strength and serviceability

TABLE 33

Example:

Dead Load:

1 x 13mm Plasterboard = 10kg/m2

Wind Load:

No wind load, building effectively sealed and air conditioned.

Using Table 34:

#125 TCR at 1200 centres with suspension at 1200mm centres along TCR

#308 furring channels at 600mm centres appears to be the most economical.

TABLE 36

Example:

Dead Load:

2 x 13mm Plasterboard = 20kg/m2

Wind Load:

No wind load, building effectively sealed and air conditioned.

Using Table 37:

#127 TCR at 900 centres with suspension at 1200mm centres along TCR

#308 furring channels at 600mm centres appears to be the most economical.

TABLE 39

Example:

Dead Load:

2 x 16mm Plasterboard = 26kg/m2

1 x 6mm Fibrous cement = 10kg/m2

Total = 36kg/m2

Wind Load:

No wind load, building effectively sealed and air conditioned.

Using Table 39:

#128 TCR at 1200 centres with suspension at 1200mm centres along TCR

#129 furring channels at 600mm centres

Suspension setout = 1.2 x 1.2 = 1.44m^2

APPENDIX B

GLOSSARY

V_{hu}	–	Ultimate design gust wind speed at height h
V_{hs}	–	Serviceability design gust wind speed at height h
C_{pi}	–	Internal pressure coefficient
L_{ci}	–	Load combination No. 1 etc.
G	–	Dead load
W_u	–	Ultimate design wind load (kPa)
W_s	–	Serviceability design wind load (kPa)
L/600	–	Deflection limits i.e. 1mm in every 600mm of span length
U	–	Service load as defined in AS/NZS 2785

Wind classification N2 was previously W33 using permissible stress method.

Wind classification N3 was previously W41 using permissible stress method.

ARCHITECTURAL SPECIFICATIONS

SCOPE

The contractor is to furnish all materials , labour and equipment for the erection of a Rondo KEY-LOCK® Building Board Ceiling Suspension System where so indicated on the architectural drawings.

MATERIAL

The Rondo KEY-LOCK® Building Board Ceiling Suspension System shall be as manufactured by Rondo Building Services Pty Ltd. All materials supplied by Rondo Building Services meet the relevant Australian and New Zealand Standards.

INSTALLATION

The Rondo KEY-LOCK® Building Board Ceiling Suspension System shall be installed as per step by step instructions shown in this brochure.

The Primary Rail shall be hung on 5mm soft galvanised rod, accurately levelled. Suspension Clips shall be at ..... mm centres along the Primary Rail.

Primary Rails are to be spaced at ..... mm centres. Furring Channels shall run at right angles to the Primary Rails and be positively locked to the Primary Rails with locking keys.

Furring Channel centres shall not exceed the recommendation of the building board manufacturer and shall be joined end to end, with Furring Channel joiners.

Primary Rails and Furring Channels shall be spaced so as not to exceed the design ceiling load or as otherwise to provide a 1/..... of span deflection.

Extra hangers shall be provided for light fittings, air conditioning units, etc. that are supported by the grid system.

Down bracing to be incorporated in ceiling systems when used externally or adjacent to openings prone to sudden uplift caused by external wind forces.

IMPORTANT

The Rondo KEY-LOCK® Ceiling Suspension System is one system in the range of Rondo Ceiling Systems.

It can interlock with one or more of the grid systems in the same ceiling, e.g., Rondo KEY-LOCK® Ceiling System can change to a DUO® Ceiling System, then to a One Way Linear System, and then back to a KEY-LOCK® Ceiling System. All positively locked together with individual provision for expansion and contraction.

The Rondo range of ceiling systems can interlock with each other in the same ceiling area, providing specialised ceilings after partitioning.

NON-STANDARD LENGTHS

These can be manufactured once a firm order has been placed.

A surcharge may be applied, subject to the quantity ordered.

ADVISORY SERVICE

Individual projects may require special detailing and development. Technical assistance is available from our engineering staff, such as detailed drawings, custom sections, or clarification of other Rondo services.

NOTE

As new technology is introduced, or industry standards are altered, Rondo reserves the right to alter existing specifications without notice.

GUARANTEE

Rondo Building Services Pty Ltd supplies the KEY-LOCK® Building Board Ceiling Suspension System which is warranted to be free from defects in material and workmanship, and will replace and/or repair any product found to be defective, if installed in accordance with our technical literature and standard guarantee details.

This warranty is in addition to any rights the customer may have at law. All Rondo Building Services' products are designed to satisfy Australian and New Zealand conditions.

ADDITIONAL RONDO PRODUCTS

CEILING SYSTEMS

- Rondo KEY–LOCK® Concealed Suspended Ceiling Systems.
- Rondo DUO® Exposed Suspended Ceiling Systems.
- Rondo TAG–LOCK™ Aluminium Exposed Suspended Ceiling Systems.
- Rondo WALK–ABOUT™ Trafficable Ceiling Systems .
- Rondo Metal Ceiling Batten Systems for Residential Construction.

DRYWALL STEEL STUD WALL FRAMING SYSTEMS

- Rondo Drywall Steel Stud Partition Systems (fire-rated, loadbearing/non-loadbearing, internal partition and curtain wall framing systems).
- Rondo Shaftwall Framing Systems.
- Rondo QUIET STUD® Drywall Sound Insulation Systems.

SOUND ISOLATION ASSEMBLIES FOR WALLS & CEILINGS

- Rondo Acoustic Isolation Assemblies for sound-rated wall & ceiling systems.

WALL & CEILING ACCESS PANEL SYSTEMS

- Rondo PANTHER® Access Panels (acoustic & fire-rated systems).

FINISHING SECTIONS

- Rondo EXANGLE® Drywall Finishing Sections.
- Rondo EXANGLE® RT Render and Texture Finishing Sections.

EZY-DRIVE

- Rondo EZY-DRIVE® Roadside Guide Posts.
- Rondo EZY-DRIVE® Utility Markers & Poly-Flex Safety Products.
- Rondo EZY-DRIVE® Roadside Accessories.
- Rondo EZY-DRIVE® STEEL-FLEX™ Flexible Steel Guide Posts.

OTHER SERVICES

- Rondo Custom Roll Forming Services.
- Rondo Technical Design and Research & Development Services.
- Rondo Freight & Logistics Services.

Rondo OFFICES

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