

the **PROFESSIONAL**
series

**SERIES C1:
WALL DESIGN DATA**

RONDO®

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Please note: This technical literature has been produced to be used STRICTLY and SPECIFICALLY with genuine Rondo products. Calculations and recommendations in this literature are based on detailed testing, tolerances, and performance of Rondo Steel products. The use of this guide with non- Rondo products is NOT recommended due to a high risk of non-compliant design and installation outcomes.

We want you to know that we've rallied the best, and most experienced experts at Rondo to produce this book so that we can offer professionals like yourself a detailed technical reference to use.

Despite our efforts however, products, systems and Building Codes do change over time, and interpretations may also vary, which means we cannot accept any liability for any of the information (or lack of information) in this manual, or any consequences which happen as a result.

We also recommend you check that you are referring to the latest edition. You can do this by comparing your book to the one currently available on our website at www.rondo.com.au.

Finally, and only because we've invested so much pride and resources into producing this information for you, we kindly ask that you help us protect the quality and exclusivity of this book by not reproducing any of our images or information for commercial purposes without our written agreement, as per the copyright laws which apply.

Version 1: first published in June 2024

WALL DESIGN DATA

C1.1 INTRODUCTION

C1.1.1 OVERVIEW

Rondo wall systems boast a long, proud history in Australia and New Zealand. Despite the increasing complexity of modern projects, Rondo remains at the forefront by consistently delivering quality, compliant products and systems to the construction industry.

With a diverse array of wall systems available, Rondo caters to a multitude of internal and external applications, including acoustic and fire-rated constructions. Each system is designed to suit its specific installation environment, taking into account factors such as wind and seismic conditions.

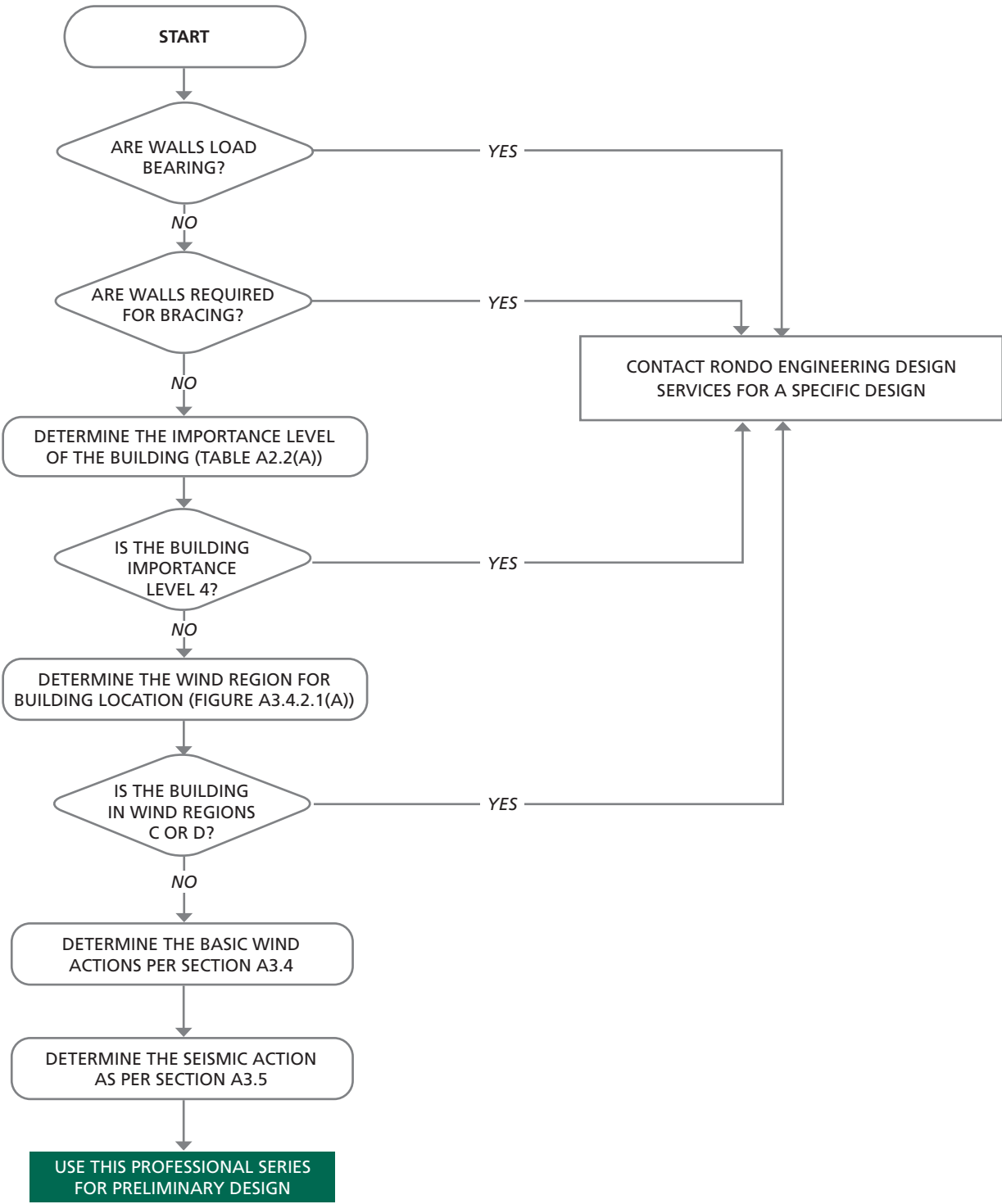
Adhering to stringent quality standards, all Rondo wall systems are designed and rigorously tested to comply with relevant Australian standards and codes. The following table provides a concise overview of the various options available, showcasing Rondo's commitment to excellence in the construction industry.

■ TABLE C1.1.1(A) – RONDO WALL SYSTEMS

WALL SYSTEM	INTERNAL OR EXTERNAL	SEISMIC	WIND	FIRE-RATED APPLICATIONS	ACOUSTIC APPLICATIONS
Stud and Track	Internal	Yes	Internal pressures	Yes	Yes
Noggings	Both	Yes	-	Yes	Yes
Duplex Stud	Internal	Yes	Internal pressures	Yes	-
Maxiframe	Both	Yes	External pressures	Yes	-
Quietstud	Internal	Yes	Internal pressures	Yes	Yes
Masonry Walls	Internal	Yes	Internal pressures	Yes	-

C1.2 GENERAL NOTES

The subsequent flow chart offers a general outline of the design procedure for standard wall designs. This tool can aid in assessing whether the Professional Series offers a suitable solution for your specific application.



■ FIGURE C1.2(A) - APPLICABILITY OF PROFESSIONAL SERIES FOR PRELIMINARY DESIGN

C.1.2.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations have been adopted in the development of this design series:

- Wall designs assume that the supporting structure has sufficient capacity to withstand all actions (and combinations thereof) imposed. This should be verified by the project/structural engineer for the project.
- This series only applies to Rondo wall systems. All components must be manufactured or supplied by Rondo and substitution is not permitted.
- Design is undertaken in accordance with the relevant Australian Standard, as applicable. In some instances, testing has been used to verify, validate or determine design capacities. Where testing is conducted, it is done so in accordance with AS/NZS4600 Section 8 as applicable.
- Partition walls must not be braced by the ceiling grid unless specially designed to do so. The internal wall are designed assuming the walls are supported by the primary structure and independent of the ceilings.
- The internal partitions may be used to restrain the ceilings under seismic condition. Refer to the details herein for limitations.

Rondo wall systems are designed in accordance with AS/NZS 4600 Cold Formed Steel Structures, where relevant.

Unless noted otherwise, imposed actions have not been considered other than gravity, wind and seismic.

C1.2.2 CONTROL JOINTS

Control joints are required at regular intervals to provide relief to the wall linings and/or framing for the expected movements. These movements can be due to changes in temperature, humidity, normal building movement or the like.

The purpose of control joints is to limit the potential for cracking of the building elements to occur, so their placement is an important consideration and should be marked on the plans accordingly.

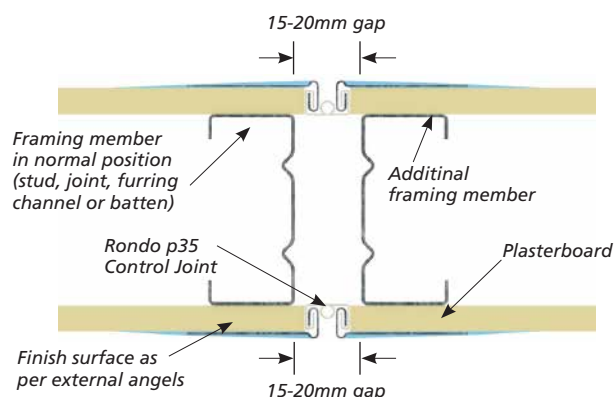


FIGURE C1.2.2(A): TYPICAL CONTROL JOINT

PLASTERBOARD LININGS

Check with your lining board manufacturer recommendations however, control joint spacing should not exceed the following limits:

LOCATION	MAXIMUM SPACING (M)
General internal wall areas, plasterboard lined only	12.0
Plasterboard tiled internal walls	4.8

In addition to the above, control joints should be installed at the following locations:

- where the lining materials change
- where the lining support framing changes
- at all junctions with other building elements
- where the wall height increases by more than 30% of the lower wall height

OTHER LININGS

Refer to lining board manufacturers published data for maximum spacing of control joints.

LOCATION	MAXIMUM SPACING (M)
Fibre-cement internal only	9.0 ⁽¹⁾
Fibre-cement tiled internal walls	4.8
Metal deck sheeting, internal	12.0

Notes:

1. Check manufacturer for limitations of stud gauge against spacing.
2. All locations are assumed internal and air conditioned, with only small operable windows or doors.
3. The above spacing assumes the temperature differential is within 30°C.

C1.3 DESIGN ACTIONS

Basic design actions are discussed in Section A3 and any design actions relevant to walls only are discussed in this section.

C1.3.1 PERMANENT ACTIONS

Refer A3.2 for minimum permanent actions and typical weights. Wall permanent actions will be the sum of the following.

- The mass of the wall linings
- Framing weight (Refer relevant stud section properties tables)
- Insulation weight (generally 1 - 2 kg/m²)
- Any additional services or the like attached to the wall

C1.3.2 IMPOSED ACTIONS

Refer to A3.3 for the general requirement of minimum imposed actions. In the first instance, walls are generally not designed to support any imposed action. As the design proceeds, imposed actions can be considered and these are typically accommodated by adjusting the stud centres and / or the stud gauge.

Typical shelf loading details are provided herein for the Rondo Stud and Track Systems, however, beyond these systems Rondo Technical Services will need to be consulted for a specific design.

C1.3.3 WIND ACTIONS

Refer to A3.4 to calculate the basic design wind pressure for the building.

Internal and external pressures on the walls are discussed in general terms in sections A3.4.3.1 and A3.4.3.2 respectively.

The determination of the appropriate internal pressure on a wall is quite complicated and requires intimate knowledge of the building and its location. AS/NZS1170.2:2021 Clause 5.3 provides a comprehensive overview of the determination of internal pressures and the solutions herein have been developed based on our understanding and interpretation of the code.

Rondo have prepared wall design tables for different wall systems at varying pressures. The following provides an overview of the determination of the internal pressures applicable for individual wall systems.

This is a guidance only and it should not be assumed that the solution presented herein is the only solution or interpretation of the wind code.

PRESSURE SEALED WALLS

Clause 5.3.3 of AS/NZS1170.2:2021 can be applied to walls that provide an effective seal to a space adjacent to an external wall. We refer to these wall systems as "pressure sealed" and they generally fall into one of the following categories:

- Fire-rated walls
- Inter-tenancy walls
- Common walls
- Any wall built specifically to provide a pressure seal (e.g; smoke seal walls or bio-hazard containment rooms in hospitals etc).

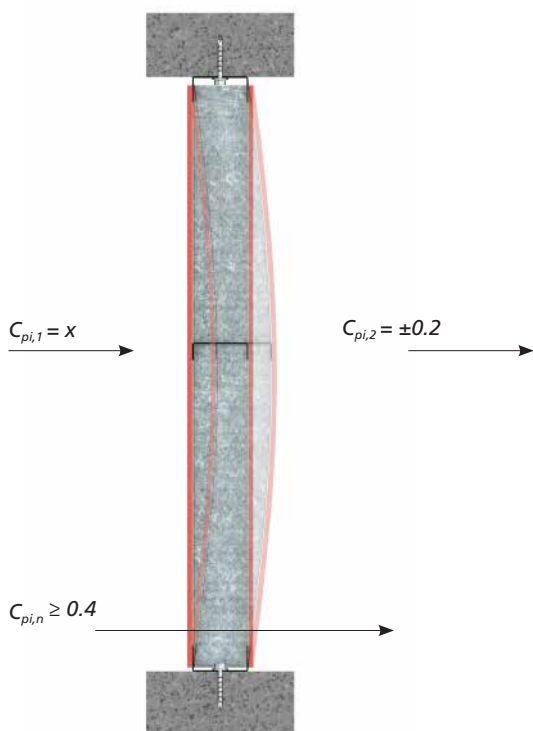
For these walls, the wind code requires the net internal pressure coefficient ($C_{pi,n}$) be determined from the worst case of the following scenarios:

1. $C_{p,i}$ determined in accordance with AS/NZS1170.2:2021 Clause 5.3.1 or 5.3.2 as appropriate in conjunction with ± 0.2 on the opposing side to give the worst case or;
2. A net internal pressure coefficient ($C_{pi,n}$) not less than 0.4.

Pressure sealed walls can be constructed as a single skin wall or a twin wall for discontinuous construction. The pressure differential across the wall is applied differently depending on the construction as follows:

PRESSURE SEALED WALLS – SINGLE LEAF

Single leaf refers to a single leaf stud wall either lined one side or both sides.



■ FIGURE C1.3.3(A): PRESSURE SEALED WALL - SINGLE LEAF

Notes:

The above Figure C1.3.3(A) provides a representation of the wind codes intent as it is to be applied to single skin pressure sealed walls. In the wall example above $C_{pi,n} = x \pm 0.2 \geq 0.4$ where: x = determined in accordance with A3.4.3.1 or AS/NZS1170.2:2021 For pressure sealed single leaf walls $K_{cl} = 0.90$ is permitted only when the absolute value of $C_{pi,n}$ is not less than 0.4. It should be noted that, in non-cyclonic areas, $C_{pi,n}$ can vary between +1.2 and -1.95, but not less than absolute 0.40, depending on wind direction and permeability / openings in the façade. Accordingly, Rondo recommends the internal net pressure coefficients ($C_{pi,n}$) be assessed by the façade designer or an appropriate qualified engineer including Rondo Design Engineers.

PRESSURE SEALED WALLS – TWIN WALLS

Twin walls refer to two separate leaves of stud wall separated by a minimum cavity of 20mm, with no mechanical linkage between. These wall types are typically lined one side, and shall be designed as such, unless the wall linings are applied to both sides of the same wall leaf.

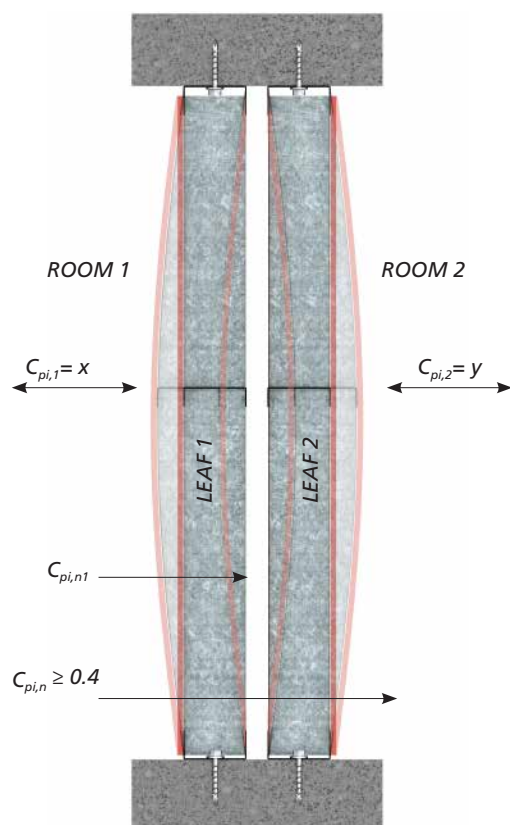


FIGURE C1.3.3(B): PRESSURE SEALED WALL - TWIN WALL

Notes:

Figure C1.3.3(B) above provides a representation of the windcodes intent as it is to be applied to pressure sealed twin walls. For these walls, the minimum net pressure coefficient ($C_{pi,n}$) of 0.4 as nominated in clause 5.3.3 of AS/NZS1170.2:2021 is considered to act across both leaves of the wall. Because there is no connectivity between the two leaves, it is possible that a single leaf is designed using $C_{p,i} < 0.4$. Therefore the net pressure coefficient acting across 'LEAF 1' ($C_{pi,n1}$) will be the greater of the internal pressure coefficient in ROOM 1 ($C_{pi,1}$) or half of the total net pressure coefficient ($C_{pi,n}$): $C_{pi,n1} = x \geq (0.4/2)$. A similar approach can be applied to determine the net pressure coefficient acting across 'LEAF 2' using the internal pressure coefficient determined for ROOM 2 (y). For pressure sealed twin walls: x and y = determined in accordance with A3.4.3.1 or AS/NZS1170.2:2021 $K_{ci} = 1.00$. It should be noted that, in non-cyclonic areas, $C_{pi,n}$ can vary between +1.2 and -1.95, but not less than absolute 0.40, depending on wind direction and permeability / openings in the façade. Accordingly, Rondo recommends the internal net pressure coefficients ($C_{pi,n}$) be assessed by the façade designer or an appropriate qualified engineer including Rondo Design Engineers.

NON-PRESSURE SEALED WALLS

Clause 5.3.3 of AS/NZS1170.2:2021 also applies to walls that do not form a permanent seal. We classify these wall systems as follows:

- Internal non-fire-rated walls
- Intra-tenancy walls
- Walls partially lined
- Lining walls such as lift lobby areas and screening walls to shear walls and the like

For these walls, the wind code requires a net differential pressure coefficient ($C_{pi,n}$) not less than 0.3.

Non-pressure sealed walls are typically constructed as a single skin wall however, they can be constructed as a twin wall with or without connectivity. The pressure differential across the wall is applied in the same manner as those for the pressure sealed walls except the minimum requirements are relaxed slightly.

LOW HEIGHT WALLS OR ISOLATED WALLS

Low height walls are typically constructed to the underside of, or slightly above the ceiling line. It should be noted that these walls should not rely on the ceiling for restraint and will require independent bracing. Pressure venting can be achieved through the ceiling, in some instances.

Isolated walls can occur where the designer is trying to achieve separation between spaces, and utilises a short wall length. In this instance the wall is not forming a space, rather is fully vented.

For these walls, the wind code allows engineering judgement to be applied and Rondo has traditionally applied a minimum internal ultimate design pressure of 0.375kPa to account for robustness of the wall.

C1.3.3.1 INTERNAL PRESSURES

Before the Maximum Wall Height Tables can be utilised the internal design pressure needs to be calculated using the previously established formula:

$$P_{i,u} = P_u C_{p,i,n} K_{c,i}$$

Fortunately this has been completed and the tables below present the net internal design pressures for a given $C_{pi,n}$ with K_{ci} set to 1.0.

■ TABLE C1.3.3.1(A): REGION A1 TO A5 IL2 INTERNAL PRESSURES

REGION A1 TO A5 - IMPORTANCE LEVEL 2												
FLOOR HEIGHT z (m)	TERRAIN CATEGORY 1				TERRAIN CATEGORY 2				TERRAIN CATEGORY 3			
	$C_{pi,n}$				$C_{pi,n}$				$C_{pi,n}$			
	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
10	0.283	0.425	0.567	0.709	0.243	0.365	0.486	0.608	0.167	0.251	0.335	0.419
20	0.316	0.474	0.632	0.790	0.283	0.425	0.567	0.709	0.215	0.322	0.429	0.537
30	0.338	0.508	0.677	0.846	0.305	0.457	0.610	0.762	0.243	0.365	0.486	0.608
40	0.356	0.534	0.712	0.889	0.327	0.490	0.654	0.817	0.263	0.394	0.526	0.657
50	0.368	0.551	0.735	0.919	0.338	0.508	0.677	0.846	0.278	0.417	0.556	0.696
60	0.377	0.566	0.755	0.943	0.348	0.521	0.695	0.869	0.289	0.433	0.577	0.722
70	0.387	0.581	0.774	0.968	0.357	0.535	0.714	0.892	0.299	0.449	0.599	0.749
80	0.397	0.595	0.794	0.992	0.364	0.546	0.728	0.910	0.309	0.464	0.618	0.773
90	0.407	0.610	0.814	1.017	0.369	0.553	0.738	0.922	0.318	0.477	0.636	0.795
100	0.417	0.626	0.834	1.043	0.374	0.560	0.747	0.934	0.327	0.490	0.654	0.817
110	0.423	0.635	0.847	1.059	0.377	0.566	0.755	0.943	0.333	0.499	0.665	0.832
120	0.430	0.645	0.860	1.075	0.381	0.571	0.762	0.952	0.338	0.508	0.677	0.846
130	0.436	0.654	0.873	1.091	0.385	0.577	0.769	0.961	0.344	0.516	0.688	0.860
140	0.443	0.664	0.886	1.107	0.388	0.582	0.776	0.971	0.350	0.525	0.700	0.875
150	0.449	0.674	0.899	1.124	0.392	0.588	0.784	0.980	0.356	0.534	0.712	0.889
160	0.453	0.680	0.907	1.134	0.394	0.592	0.789	0.986	0.359	0.539	0.719	0.898
170	0.457	0.686	0.915	1.144	0.397	0.595	0.794	0.992	0.363	0.544	0.726	0.907
180	0.461	0.692	0.923	1.154	0.399	0.599	0.799	0.998	0.366	0.550	0.733	0.916
190	0.465	0.698	0.931	1.164	0.402	0.603	0.804	1.005	0.370	0.555	0.740	0.925
200	0.470	0.704	0.939	1.174	0.404	0.607	0.809	1.011	0.374	0.560	0.747	0.934
Service Ratio	0.676	0.676	0.676	0.676	0.676	0.676	0.676	0.676	0.676	0.676	0.676	0.676

■ TABLE C1.3.3.1(B): REGION A1 TO A5 IL3 INTERNAL PRESSURES

REGION A1 TO A5 - IMPORTANCE LEVEL 3												
FLOOR HEIGHT z (m)	TERRAIN CATEGORY 1				TERRAIN CATEGORY 2				TERRAIN CATEGORY 3			
	$C_{pi,n}$				$C_{pi,n}$				$C_{pi,n}$			
	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
10	0.296	0.444	0.592	0.740	0.254	0.381	0.508	0.635	0.175	0.262	0.350	0.437
20	0.330	0.495	0.660	0.825	0.296	0.444	0.592	0.740	0.224	0.337	0.449	0.561
30	0.354	0.530	0.707	0.884	0.319	0.478	0.637	0.796	0.254	0.381	0.508	0.635
40	0.372	0.558	0.744	0.929	0.342	0.513	0.683	0.854	0.275	0.412	0.549	0.687
50	0.384	0.576	0.768	0.960	0.354	0.530	0.707	0.884	0.291	0.436	0.581	0.727
60	0.394	0.591	0.788	0.986	0.363	0.545	0.726	0.908	0.302	0.453	0.603	0.754
70	0.404	0.607	0.809	1.011	0.373	0.559	0.746	0.932	0.313	0.469	0.626	0.782
80	0.415	0.622	0.829	1.037	0.380	0.571	0.761	0.951	0.323	0.485	0.646	0.808
90	0.425	0.638	0.850	1.063	0.385	0.578	0.771	0.964	0.332	0.498	0.665	0.831
100	0.436	0.654	0.872	1.089	0.390	0.586	0.781	0.976	0.342	0.513	0.683	0.854
110	0.442	0.664	0.885	1.106	0.394	0.591	0.788	0.986	0.348	0.521	0.695	0.869
120	0.449	0.674	0.898	1.123	0.398	0.597	0.796	0.995	0.354	0.530	0.707	0.884
130	0.456	0.684	0.912	1.140	0.402	0.603	0.804	1.005	0.360	0.539	0.719	0.899
140	0.463	0.694	0.926	1.157	0.406	0.609	0.811	1.014	0.366	0.548	0.731	0.914
150	0.470	0.704	0.939	1.174	0.410	0.614	0.819	1.024	0.372	0.558	0.744	0.929
160	0.474	0.711	0.948	1.185	0.412	0.618	0.824	1.030	0.375	0.563	0.751	0.939
170	0.478	0.717	0.956	1.195	0.415	0.622	0.829	1.037	0.379	0.569	0.758	0.948
180	0.482	0.723	0.964	1.205	0.417	0.626	0.835	1.043	0.383	0.574	0.766	0.957
190	0.486	0.730	0.973	1.216	0.420	0.630	0.840	1.050	0.387	0.580	0.773	0.967
200	0.491	0.736	0.981	1.226	0.423	0.634	0.845	1.056	0.390	0.586	0.781	0.976
Service Ratio	0.647	0.647	0.647	0.647	0.647	0.647	0.647	0.647	0.647	0.647	0.647	0.647

Notes:

1. Importance Level 4 buildings require a specific design and will need to be referred to Rondo.
2. Values may be proportioned for $K_{c,i}$ and K_v values other than 1.0.
3. Wind speed and Annual Probability of Exceedance in accordance with Tables A3.4.2.1(A) and A2.2(B) respectively.
4. For buildings or structures up to 100m tall, in Region A0 use Terrain Category 2 from tables C1.3.3.1(A) or (B) as appropriate to determine the design pressure.

■ TABLE C1.3.3.1(C): REGION B1 IL2 INTERNAL PRESSURES

REGION B1 - IMPORTANCE LEVEL 2												
FLOOR HEIGHT z (m)	TERRAIN CATEGORY 1				TERRAIN CATEGORY 2				TERRAIN CATEGORY 3			
	$C_{pi,n}$				$C_{pi,n}$				$C_{pi,n}$			
	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
10	0.410	0.616	0.821	1.026	0.352	0.528	0.704	0.880	0.242	0.364	0.485	0.606
20	0.457	0.686	0.915	1.143	0.410	0.616	0.821	1.026	0.311	0.466	0.622	0.777
30	0.490	0.735	0.980	1.225	0.441	0.662	0.883	1.103	0.352	0.528	0.704	0.880
40	0.515	0.773	1.030	1.288	0.473	0.710	0.947	1.184	0.381	0.571	0.761	0.951
50	0.532	0.799	1.065	1.331	0.490	0.735	0.980	1.225	0.403	0.604	0.806	1.007
60	0.546	0.819	1.093	1.366	0.503	0.755	1.007	1.258	0.418	0.627	0.836	1.045
70	0.560	0.841	1.121	1.401	0.517	0.775	1.034	1.292	0.434	0.650	0.867	1.084
80	0.575	0.862	1.149	1.437	0.527	0.791	1.054	1.318	0.448	0.672	0.895	1.119
90	0.589	0.884	1.178	1.473	0.534	0.801	1.068	1.335	0.461	0.691	0.921	1.151
100	0.604	0.906	1.208	1.510	0.541	0.812	1.082	1.353	0.473	0.710	0.947	1.184
110	0.613	0.920	1.226	1.533	0.546	0.819	1.093	1.366	0.482	0.723	0.963	1.204
120	0.622	0.934	1.245	1.556	0.552	0.827	1.103	1.379	0.490	0.735	0.980	1.225
130	0.632	0.948	1.264	1.580	0.557	0.835	1.114	1.392	0.498	0.747	0.997	1.246
140	0.641	0.962	1.283	1.603	0.562	0.843	1.124	1.405	0.507	0.760	1.013	1.267
150	0.651	0.976	1.302	1.627	0.568	0.851	1.135	1.419	0.515	0.773	1.030	1.288
160	0.657	0.985	1.313	1.641	0.571	0.857	1.142	1.428	0.520	0.780	1.041	1.301
170	0.662	0.994	1.325	1.656	0.575	0.862	1.149	1.437	0.525	0.788	1.051	1.314
180	0.668	1.002	1.336	1.670	0.578	0.867	1.157	1.446	0.531	0.796	1.061	1.327
190	0.674	1.011	1.348	1.685	0.582	0.873	1.164	1.455	0.536	0.804	1.072	1.340
200	0.680	1.020	1.360	1.700	0.586	0.878	1.171	1.464	0.541	0.812	1.082	1.353
Service Ratio	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468

■ TABLE C1.3.3.1(D): REGION B1 IL3 INTERNAL PRESSURES

REGION B1 - IMPORTANCE LEVEL 3												
FLOOR HEIGHT z (m)	TERRAIN CATEGORY 1				TERRAIN CATEGORY 2				TERRAIN CATEGORY 3			
	$C_{pi,n}$				$C_{pi,n}$				$C_{pi,n}$			
	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
10	0.455	0.682	0.910	1.137	0.390	0.585	0.780	0.975	0.269	0.403	0.537	0.671
20	0.507	0.760	1.013	1.267	0.455	0.682	0.910	1.137	0.344	0.517	0.689	0.861
30	0.543	0.814	1.086	1.357	0.489	0.734	0.978	1.223	0.390	0.585	0.780	0.975
40	0.571	0.856	1.142	1.427	0.525	0.787	1.049	1.312	0.422	0.633	0.843	1.054
50	0.590	0.885	1.180	1.475	0.543	0.814	1.086	1.357	0.446	0.670	0.893	1.116
60	0.605	0.908	1.211	1.513	0.558	0.837	1.115	1.394	0.463	0.695	0.926	1.158
70	0.621	0.931	1.242	1.552	0.573	0.859	1.145	1.432	0.480	0.721	0.961	1.201
80	0.637	0.955	1.274	1.592	0.584	0.876	1.168	1.460	0.496	0.744	0.992	1.240
90	0.653	0.979	1.306	1.632	0.592	0.888	1.184	1.479	0.510	0.765	1.020	1.276
100	0.669	1.004	1.338	1.673	0.599	0.899	1.199	1.499	0.525	0.787	1.049	1.312
110	0.679	1.019	1.359	1.698	0.605	0.908	1.211	1.513	0.534	0.801	1.067	1.334
120	0.690	1.034	1.379	1.724	0.611	0.917	1.222	1.528	0.543	0.814	1.086	1.357
130	0.700	1.050	1.400	1.750	0.617	0.926	1.234	1.543	0.552	0.828	1.104	1.380
140	0.711	1.066	1.421	1.776	0.623	0.934	1.246	1.557	0.561	0.842	1.123	1.404
150	0.721	1.082	1.442	1.803	0.629	0.943	1.258	1.572	0.571	0.856	1.142	1.427
160	0.727	1.091	1.455	1.819	0.633	0.949	1.266	1.582	0.576	0.865	1.153	1.441
170	0.734	1.101	1.468	1.835	0.637	0.955	1.274	1.592	0.582	0.873	1.164	1.456
180	0.740	1.111	1.481	1.851	0.641	0.961	1.282	1.602	0.588	0.882	1.176	1.470
190	0.747	1.120	1.494	1.867	0.645	0.967	1.290	1.612	0.594	0.891	1.187	1.484
200	0.753	1.130	1.507	1.883	0.649	0.973	1.298	1.622	0.599	0.899	1.199	1.499
Service Ratio	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423

■ TABLE C1.3.3.1(E): REGION B2 IL2 INTERNAL PRESSURES

REGION B2 - IMPORTANCE LEVEL 2												
FLOOR HEIGHT z (m)	TERRAIN CATEGORY 1				TERRAIN CATEGORY 2				TERRAIN CATEGORY 3			
	$C_{pi,n}$				$C_{pi,n}$				$C_{pi,n}$			
	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
10	0.406	0.609	0.812	1.015	0.348	0.522	0.696	0.870	0.240	0.360	0.480	0.600
20	0.452	0.679	0.905	1.131	0.406	0.609	0.812	1.015	0.308	0.461	0.615	0.769
30	0.485	0.727	0.970	1.212	0.437	0.655	0.873	1.092	0.348	0.522	0.696	0.870
40	0.510	0.765	1.020	1.274	0.469	0.703	0.937	1.171	0.377	0.565	0.753	0.941
50	0.527	0.790	1.054	1.317	0.485	0.727	0.970	1.212	0.399	0.598	0.797	0.997
60	0.541	0.811	1.081	1.351	0.498	0.747	0.996	1.245	0.414	0.620	0.827	1.034
70	0.555	0.832	1.109	1.386	0.511	0.767	1.023	1.279	0.429	0.643	0.858	1.072
80	0.569	0.853	1.137	1.422	0.522	0.782	1.043	1.304	0.443	0.665	0.886	1.108
90	0.583	0.874	1.166	1.457	0.528	0.793	1.057	1.321	0.456	0.683	0.911	1.139
100	0.597	0.896	1.195	1.494	0.535	0.803	1.071	1.338	0.469	0.703	0.937	1.171
110	0.607	0.910	1.213	1.517	0.541	0.811	1.081	1.351	0.477	0.715	0.953	1.192
120	0.616	0.924	1.232	1.540	0.546	0.819	1.092	1.364	0.485	0.727	0.970	1.212
130	0.625	0.938	1.250	1.563	0.551	0.827	1.102	1.378	0.493	0.740	0.986	1.233
140	0.635	0.952	1.269	1.586	0.556	0.834	1.113	1.391	0.501	0.752	1.003	1.253
150	0.644	0.966	1.288	1.610	0.562	0.842	1.123	1.404	0.510	0.765	1.020	1.274
160	0.650	0.975	1.299	1.624	0.565	0.848	1.130	1.413	0.515	0.772	1.030	1.287
170	0.655	0.983	1.311	1.638	0.569	0.853	1.137	1.422	0.520	0.780	1.040	1.300
180	0.661	0.992	1.322	1.653	0.572	0.858	1.144	1.431	0.525	0.788	1.050	1.313
190	0.667	1.000	1.334	1.667	0.576	0.864	1.152	1.440	0.530	0.795	1.060	1.325
200	0.673	1.009	1.345	1.682	0.579	0.869	1.159	1.448	0.535	0.803	1.071	1.338
Service Ratio	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468	0.468

■ TABLE C1.3.3.1(F): REGION B2 IL3 INTERNAL PRESSURES

REGION B2 - IMPORTANCE LEVEL 2												
FLOOR HEIGHT z (m)	TERRAIN CATEGORY 1				TERRAIN CATEGORY 2				TERRAIN CATEGORY 3			
	$C_{pi,n}$				$C_{pi,n}$				$C_{pi,n}$			
	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
10	0.450	0.675	0.900	1.125	0.386	0.579	0.772	0.964	0.266	0.399	0.532	0.664
20	0.501	0.752	1.003	1.253	0.450	0.675	0.900	1.125	0.341	0.511	0.682	0.852
30	0.537	0.806	1.074	1.343	0.484	0.726	0.968	1.210	0.386	0.579	0.772	0.964
40	0.565	0.847	1.130	1.412	0.519	0.779	1.038	1.298	0.417	0.626	0.835	1.043
50	0.584	0.875	1.167	1.459	0.537	0.806	1.074	1.343	0.442	0.663	0.883	1.104
60	0.599	0.898	1.198	1.497	0.552	0.828	1.104	1.380	0.458	0.688	0.917	1.146
70	0.614	0.922	1.229	1.536	0.567	0.850	1.133	1.417	0.475	0.713	0.951	1.188
80	0.630	0.945	1.260	1.575	0.578	0.867	1.156	1.445	0.491	0.736	0.982	1.227
90	0.646	0.969	1.292	1.615	0.586	0.878	1.171	1.464	0.505	0.757	1.010	1.262
100	0.662	0.993	1.324	1.655	0.593	0.890	1.186	1.483	0.519	0.779	1.038	1.298
110	0.672	1.008	1.344	1.680	0.599	0.898	1.198	1.497	0.528	0.792	1.056	1.320
120	0.682	1.024	1.365	1.706	0.605	0.907	1.209	1.512	0.537	0.806	1.074	1.343
130	0.693	1.039	1.385	1.732	0.611	0.916	1.221	1.526	0.546	0.819	1.093	1.366
140	0.703	1.055	1.406	1.758	0.616	0.925	1.233	1.541	0.556	0.833	1.111	1.389
150	0.714	1.070	1.427	1.784	0.622	0.933	1.244	1.556	0.565	0.847	1.130	1.412
160	0.720	1.080	1.440	1.800	0.626	0.939	1.252	1.565	0.570	0.856	1.141	1.426
170	0.726	1.089	1.452	1.815	0.630	0.945	1.260	1.575	0.576	0.864	1.152	1.440
180	0.733	1.099	1.465	1.831	0.634	0.951	1.268	1.585	0.582	0.873	1.164	1.454
190	0.739	1.108	1.478	1.847	0.638	0.957	1.276	1.595	0.587	0.881	1.175	1.469
200	0.745	1.118	1.491	1.863	0.642	0.963	1.284	1.605	0.593	0.890	1.186	1.483
Service Ratio	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423	0.423

NOTES:

1. Importance Level 4 buildings require a specific design and will need to be referred to Rondo.
2. Values may be proportioned for $K_{c,i}$ and K_v values other than 1.0.
3. Wind speed and Annual Probability of Exceedance in accordance with Tables A3.4.2.1(A) and A2.2(B) respectively.
4. For buildings or structures up to 100m tall, in Region A0 use Terrain Category 2 from tables C1.3.3.1(A) or (B) as appropriate to determine the design pressure.
5. The basic pressure for Region B2 includes a directionality factor (M_d) of 0.90 which is suitable for application to internal walls and results in the above internal design pressures.

C1.3.4 EARTHQUAKE ACTIONS

Refer to A3.5 for the minimum requirements of earthquake actions.

C1.3.4.1 SEISMIC RESTRAINT OF THE WALLS

All wall systems are to be restrained against horizontal and vertical actions, differential movements in the structure and any other likely or expected condition.

PERIMETER RESTRAINED CEILINGS

Walls will be required to restrain the ceilings under seismic actions where the ceiling has been designed as perimeter restrained. Refer to Professional series B for further details.

This option requires a fixed or rigid connection between the ceiling grid members and the perimeter wall along two adjacent sides of the ceiling, coupled with a free or slotted connection along the two opposite sides.

SEISMIC JOINTED CEILINGS

This is an extension of the perimeter restraint method discussed above, and requires similar restraint of the ceiling at the perimeter wall.

ONE AND TWO-WAY BRACED CEILINGS

In this option the ceiling is fully restrained by the structure above and there is no load transfer to the perimeter walls. Accordingly, the wall design does not have to be assessed for ceiling seismic actions.

C1.4 LOAD COMBINATIONS

Refer Professional series A4 for the different load combinations considered to determine the worst design action effect for the ultimate and serviceability limit states.

C1.5 DEFLECTION LIMITS

Horizontal deflection of the wall systems throughout this series, under serviceability actions, have been limited to the values given in Table C1.5.(A). Should these limits not be acceptable for your specific project contact Rondo Technical Services to discuss alternative project specific requirements.

TABLE C1.5(A): HORIZONTAL DEFLECTION LIMITS

WALL FINISH	SERVICEABILITY LOAD CASE	DEFLECTION LIMIT
Flexible Lining	G + Ws	Span/200
Flexible Lining	G + Ws	Span/240
Brittle Lining	G + Ws	Span/360
Project Specific or Very Brittle	G + Ws	Span/500

NOTES:
Deflection of wall systems should be checked for following scenarios:
a. span/240 to a maximum of 30mm at a serviceability pressure of 0.25kPa.
b. span/200, span/360 or span/500, as nominated, at a serviceability pressure calculated in accordance with AS/NZS 1170.2:2021.

C1.6 INSTALLATION

C1.6.1 CEILINGS INTERACTION

Ceilings shall not be attached to the partition systems unless designed accordingly. Refer to the relevant data in Professional Series A for details and limitations.

Where the seismic actions from the ceiling are transferred to the partition, the partitions shall be laterally braced or connected to the primary structure. The bracing shall be independent of any ceiling bracing system.

C1.6.2 COMMENCEMENT OF INSTALLATION

Internal wall framing installation should not proceed until wet trades are completed and dry, unless appropriate measures are put in place to keep the framing dry and uncontaminated.

C1.7 SCREW FIXINGS

All screw fasteners are to comply with AS3566 Part 1: General requirements and mechanical properties.

Self-drilling (SD) screw refers to an externally threaded fastener that can drill and cut its own thread.

Although the reference may be to “drilling” action, the same reference is made for needle-point screws which work by piercing the steel.

Although the following is not exhaustive in content, it is provided for reference to some of the more common screws fasteners likely to be found. Materials of connection will likely determine the point of the screw required.

C1.7.1 DRILL POINT SCREWS

Drill point screws are typically used for heavier and thicker gauge steel. The nominated minimum thickness for these screws is 0.90mm, which should be taken as the individual layer thickness, not total layer thickness.

In thinner gauge steel drill points can burst through the steel and reduce the screw connectivity capacity.



FIGURE C1.7.1(A): DRILL POINT SCREWS

When fixing to hot rolled structural steel, drill point screws will be required, and can be used for fixings into steel up to 12mm thick.

C1.7.2 NEEDLE POINT SCREWS

Needle point screws are typically used for lighter and thinner gauge steel. The nominated maximum thickness for these screws is 0.80mm, which should be taken as the individual layer thickness, not total layer thickness.

Because the needle point is quite fine, these screws will not pierce through the thicker steel and allow a mating thread to be formed, rather than “cut”.



FIGURE C1.7.2(A): NEEDLE POINT SCREW

C1.7.3 SCREW SIZE

Screws are conventionally nominated by numerical designation No. 6, No. 8 etc. however, the screw design capacities are determined based on the nominal screw diameter (df).

Table C1.7.3(A) provides correlation between the screw designation, and diameter used in design.

TABLE C1.7.3(A): FASTENER SIZES

SCREW DESIGNATION	FASTENER DIAMETER DF (MM)
No. 6	3.50
No. 8	4.20
No. 10	4.80
No. 12	5.40

C1.7.4 HEAD TYPE

Screws are available with different head profiles and depending on the application in which they are to be used will determine which head profile to use.



Hexagon head screws are normally specified by Rondo when using the MAXIjamb brackets, and general fixings within the wall cavity and the like where wall linings will not be impeded.



■ FIGURE C1.7.4(A): SLOTTED BRACKETS

The MAXIjamb brackets have normally 6mm holes and slots which accommodate the No. 12 screws with minimal clearance.

Care should be taken when using hexagon head screws with lighter gauge steel to ensure the threads do not strip from over-tightening. All stripped threads should be replaced.

SCREW COATING AND COMPATIBILITY

It is very important to select screws which are compatible with Rondo framing, both in terms of application and performance.

Black phosphate screw coatings are not recommended for linings due to potential bleed through.

Zinc plated screws are recommended for internal applications only.

Screws used externally or in wet cavities are to be selected based on the corrosion classification at the site. Stainless steel screws are not to be used in direct contact with Rondo zinc coated steel stud and track sections.

■ TABLE C1.7.4(A): SCREW TYPE AND APPLICATIONS

SCREW TYPE	TYPICAL APPLICATION
HEXAGON HEAD DRILL POINT 	Fixings to: brackets and cleats structural steel bracing members
BUTTON HEAD NEEDLE POINT 	Fixings to: stud and tracks up to 0.80mm thick plumbing and electrical supports bracing straps Noggings
BUGLE HEAD S-POINT/NEEDLE POINT 	
WAFER HEAD DRILL POINT 	Fixings to: stud and tracks up to 1.15mm thick universal brackets
BUGLE HEAD DRILL POINT 	

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