



NEW ZEALAND INSTITUTE OF
ARCHITECTS
INCORPORATED

**DZ3604 Timber Framed Buildings
Submission to Standards New Zealand
By the New Zealand Institute of Architects (Inc)**

Background

The revisions to NZS3604 are the result of a limited technical review. The scope of the review was to upgrade the structural requirements to meet the AS/NZS 1170 Loadings Standard; review durability to ensure that fixings are durable with changes to our understanding of corrosion risk and new copper based timber treatments; Removal of references to specific water tightness systems coinciding with the revision on NZBC E2/AS1 to include them; Review of Bracing design for clarity and requirements; Roof framing to include roof trusses particularly the transfer of loads to wall framing and finally overall clarity, accuracy and completeness.

General

Overtime NZS3604 has become more complex and more difficult to use. Rather than being a guide for builders and non-technical people it has become a design guide that requires a good technical grasp to be able to use it. Apart from its ever increasing size there is a lot of jargon that could be easily simplified.

There is also the cost issue, it is almost mandatory to use it when designing and constructing small buildings. There is an inconsistency where NZBC and Acceptable Solutions are available free on-line but NZS3604, a cited document is quite expensive. Because of its expense it is not common to see copies of the standard on site and therefore it is likely that many buildings are being constructed without reference to it and it is possible that these buildings do not fully meet the standard. It would be best if NZS3604 could be made freely available on line and that this was partly or fully funded by taxes or through a building levy.

Various sections of the standard need to be photocopied from time to time and the use of colour or hatching for readability needs to be achieved when those sections are copied in greyscale.

Formal Feedback

Section clause, table, figure No.	Description / Public comment instructions and rationale	Feedback comment Section
Tables	The tables have been rationalised to find a way to reduce the quantity of tables in the book. NOTE – VSG 8 / MSG 8 tables are to be retained in the body of their respective sections and VSG 6 / No1 framing and VSG/MSG 10 tables are to be moved to appendices at the back of each section. Please comment on the following: • Table rationalisation • Should VSG 6 / No 1 framing and VSG/MSG 10 remain in the body of the document or moved to the back of each section?	Put MSG6/VSG6 and MSG10/VSG10 in an appendix at the very back of the document. Could look at taking MSG10/VSG10 out altogether and making these tables available elsewhere for those that might want to use them. The argument for this would be that currently other timbers that are more widely used are not included such as Lawsons Cypress, Macrocarpa and Douglas Fir. Alternatively could these be handled by multipliers including other timber types and once again placed in an appendix?
Foreword	Foreword has been updated.	
Definitions	Align definitions with NZBC and general editorial work to ensure alignment with changes sections in the draft. NOTE – This is work in progress that will be completed by Standards New Zealand during the final editorial check prior to publishing. We welcome feedback on editorial work however it is not necessary.	Put SED in to the definitions under SED rather than Specific Engineering Design
Section 1		
Figure 1.1	Revised	
Figure 1.3(a)	New figure (2) isometric diagrams	
Section 2		
2.3	Heading changed to Timber and wood-based building components to align with change to 4.3	
2.3.2	Clause revised G8 is for wet in service use only.	
2.3.3 (c)& (d)	(c) and (d) has been deleted	
C2.3.4	Removed G8 from last paragraph To align change to 2.3.2	

2.4.7	Removed reference to BCA process in last paragraph There has been a lot of confusion/conflict between BCA's and users in the past surrounding interpretation of various clauses and commentary in NZS 3604. A decision was made to remove all references to BCA process throughout the Standard.	
	New clauses	

2.3.6	Moved from 4.3.4.1 –	
2.3.7	Moved from 4.3.4.2	
2.3.8	Moved from 4.3.4.4	
2.3.9 2.3.9.1 2.3.9.2 2.3.9.3 2.3.9.4 2.3.9.5 2.3.9.6 C2.3.9.6	2.3.9 is a new clause relating to the introduction of the use of engineered timber products into 3604. NOTE – Standards New Zealand would like specific feedback on the addition of clause 2.3.9.	Agree
Section 3	Section 3 has been revised to align with AS/NZS 1170. Information surrounding soils bearing capacity and testing methods for the determination of good ground has been updated. There was a lot of debate on whether or not penetrometer testing should be removed from NZS 3604 and whether or not shear vane testing should be included as an option for testing soil conditions. The technical committee would like to reserve their final decision on these issues until public comment is closed. NOTE – Please provide feedback on section 3. Currently the testing method prescribed in NZS 3604 is scala penetrometer. Recommendations were made to include shear vane testing as an option in NZS 3604. The options discussed were to introduce shear vane testing either under clause status or as an optional testing method under commentary. Some of the issues were: • What impact will the introduction of shear vane testing have on cost? • How will BCAs view and handle this? • What about the regulatory requirements? • NZS 3604 is a prescriptive Standard not requiring specific engineering design. What impact will there be from removing scala penetrometer testing? Please comment. Once again the issues are: 1. Should scala penetrometer testing be retained in NZS 3604?	<p>The Scala Penetrometer typically gives conservative readings for cohesive soils and while this is acceptable as a trigger from a risk perspective, will tend to trigger specific engineering design more often than justified and ultimately lead to more expense than if shear vane testing were permitted as the trigger. We therefore believe that if the Scala Penetrometer is to remain in the standard then shear vane testing should also be included as a more modern and accurate test for the cohesive soil types that are found in the Auckland region. The additional cost of the shear vane equipment would be more than offset by the savings in not requiring specific soils testing. Either tool could be easily used by structural engineers or others with recognized specific training. Also, there does not appear to be a significant difference in the technical ability for using and recording the results from either instrument.</p> <p>Anecdotally BCA's tend to only accept Scala Penetrometer tests from engineers so this would tend to suggest that neither soil test method should be in the standard as they are only used as part of SED. However, as the test method is only a trigger for SED, safety factors are built into the standard and it</p>

		is possible that people other than engineers could be trained to use either instrument, then our first preference is that both test methods are included. If this is rejected then we believe that both methods should be excluded.
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	2. Should shear vane testing be included as an option in NZS 3604?	
Section 4	<p>Section 4 has been completely revised. Corrosion zones have been changed to align with AS/NZS 1170. Geothermal zone removed and maps updated accordingly. Fasteners reviewed and all cladding information including brick veneer has been removed to be included in Compliance Document E2/AS1 which is being reviewed in parallel with NZS 3604.</p> <p>NOTE – Standards New Zealand would like specific feedback on the use of stainless steel fasteners in timber treated with copper based timber preservative. There has been much debate over whether or not such fixings should be in stainless steel regardless of being in a sheltered or exposed environment. Currently table 4.3 requires galvanised in sheltered and exposed areas in zones B , C & D, and stainless steel in exposed areas in zone D.</p>	We support the change to stainless steel fixings where required for the higher corrosion risk presented by the new copper based timber treatments.
Other	<p>Insulating concrete floor slabs. NOTE – The technical committee discussed insulating concrete floor slabs and thermal breaks for traditional slab construction. Please comment on whether or not this should be taken under consideration in NZS 3604. If you would like to comment and require further information please click on the links below</p> <p>http://www.branz.co.nz/cms_show_download.php?id=629</p> <p>http://www.branz.co.nz/cms_show_download.php?id=611</p>	It is increasingly common to insulate concrete slabs to improve energy performance of buildings. Integrating insulation into the foundation requires structural consideration so it should be included in NZS3604
Section 5	<p>Section 5 has been completely revised to align with recent research undertaken by BRANZ that has identified areas that need updating. The layout has been reconfigured to make it easier to follow. Feedback received from surveys conducted by Standards New Zealand prior to starting the revision of NZS 3604 indicated the bracing section was confusing and too open to interpretation. Most of the tables and figures have been revised. NOTE – The flow of section 5 has been changed to take a more logical step by step approach when calculating bracing requirements. • Please review and provide comment as to the flow of the document, including its usability and clarity.</p>	<p>We agree that the usability and clarity are improved. Some minor improvements are:</p> <p>Table 5.2 Procedure for determination of topographic class Change 'v. steep' to 'very steep'</p> <p>Table 5.7 Wind bracing demand Change Notes section to white</p> <p>Tables 5.5 to 5.7 'ground to apex' to 'height of ground to apex'</p> <p>Figure 5.2 Topographic zone Make vertical and horizontal H's the same width as they look unequal Separate the Escarpment condition</p>

		<p>into a second figure which shows the true double horizontal lengths of the 2H.</p> <p>Put Escarpment in to the definitions defining what the difference between a small flattening out versus an escarpment</p>
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Section 6		
6.8.3.3	Deleted (b)	
Table 6.3	Revised VSG 8 and MSG 8 only	
6.11.1.5	Revised	
6.11.2.1	Revised	
6.11.2.2	Revised	
Figure 6.12	Revised	
6.11.2.3	Deleted	
6.11.3	Revised	
Figure 6.12	Revised	
6.11.4.2	Revised	
6.11.5	Revised	
6.11.6.1	Revised	
6.11.6.2	Revised	
6.11.7	Revised	
6.11.7.1 & 6.11.7.2	Revised/combined	
Figures 6.13, 6.14, & 6.15	Figures redrawn to align with current building practice	
Figure 6.15(a)	New figure	
Table 6.6	Revised VSG 8 and MSG 8 only	Include 90x125 bearers as the jump in span distance is large between 90x90 and 140x70
Appendices	Tables No1 / VSG 6 and VSG/MSG 10	Better moved to the end of the document
Section 7		There was a discussion about cantilevered decks which are shown in the draft. With an open slat deck, there is a high risk of water tracking along the joists and into the internal spaces of the building. There should be a comment to that effect in NZS 3604 to highlight the risk. However the type should be retained as cantilevered decks with a membrane have a low risk of water tracking in.
Table 7.1	Revised VSG 8 and MSG 8 only	
Table 7.2	Revised VSG 8 and MSG 8 only	
7.4.1.2	Revised	
Figure 7.9(a)	New figure added	The position of the house needs to be shown for clarity and break lines evened up. The detail should also show the alternative location of the baluster fixed to the front of the edge beam. This diagram differs from

		Section 2.3 of B1/AS1 and perhaps there needs to be some coordination to ensure that both these solutions work and that if they do a note to help determine which one to use for a particular instance. The B1/AS1 details look to be of lower strength.
C7.4 .1.2	New	
7.5.12	Revised	
C7.5.12	New	
7.5.12.1	Revised	
7.5.12.2	Revised	
7.5.12.3	Revised	
7.5.12.4	Revised	
Appendices	Tables - No1 / VSG 6 and VSG/MSG 10	Better moved to the end of the document
Section 8		
8.3.1	Revised	
8.3.1.1	Revised	
8.3.1.2	Revised	
8.3.1.3	Revised	
Table 8.2 (a&b)	Revised	
Table 8.2(c)	Revised	
Table 8.2(d)	Revised	
Table 8.4	Revised	
Table 8.9	Revised	
Table 8.10	Revised	
Table 8.11	Revised	
Table 8.12	Revised	
Table 8.13	Revised	
Appendices	Tables - No1 / VSG 6 and VSG/MSG 10	Better moved to the end of the document

Section 9		Section 9 Walls Title would better read as Posts
Figure 9.2	Revised	
Figure 9.3	Revised	
Section 10	Many clauses, tables and figures have been revised and updated.	Section 10.2 Systems to Resist Vertical Loads Title would better read "Methods to Resist Vertical Loads". Section 10.3 Systems to Resist Horizontal Loads Title would better read "Methods to Resist Horizontal Loads".
10.1.1(d)	Revised	
10.1.5.1	Revised	
Table 10.1	New table moved to 10.3 & re-numbered 10.13(a)	
10.2.1.2.3	Revised	
Tables 10.2 (a) & (b)	Revised to include light and heavy roofs for all wind zones including extra high up to 1.0	Agree

	kPa snow load. Factors have been added for low, medium, high, and very high wind zones. VSG 6/No 1 framing and VSG/MSG 10 moved to back of section 10. NOTE – Please provide specific feedback on: <ul style="list-style-type: none"> • Revised approach to tables using multiplying factor for L,M,H,VH wind zones. • Moving VSG 6/No1 framing and VSG/MSG 10 to back of section 	
Figure 10.5(a)	New figure	
Table 10.4	Revised	
Figure 10.9	Moved to same page as table 10.5	
Table 10.5	Revised	
10.2.1.8(b)	Deleted	
Table 10.6(a)	Revised	
Table 10.6(b)	Revised	
10.2.1.10.2	Added table no 10.6(a) to existing table. No changes to table	
Table 10.7	Revised for extra high wind zones with multiplication factors for L,M,H,VH	
10.2.1.12	Revised	
Table 10.8	Revised	
10.2.1.14.1	Revised	
10.2.1.15.2	Revised	
10.2.1.15.3	Revised	
Table 10.8(a)	New Table	
Figure 10.15	Revised (B) to align with current building practice	
Table 10.9	Revised	
Table 10.9(a)	New table	
Table 10.10	Deleted original and replaced with new table.	
10.2.1.16.1	Revised	
C10.2.1.16.1	Revised	
10.2.1.16.3	Revised	
10.2.1.16.5	Revised	
10.2.1.16.6	New	
10.2.1.16.6.1	New	
10.2.1.16.6.2	New	
10.2.1.16.7 & C10.2.1.16.7	Renumbered from 10.2.1.16.6	
10.2.1.17.1	Revised	

Figure 10.20	Deleted (C)	
Table 10.11	Revised	
10.2.2	The truss section has been completely rewritten. NOTE – Please provide specific feedback on this section. Previous industry feedback indicated there is confusion surrounding interpretation differences between BCAs and designers, architects, and builders.	The revised truss section is good
10.3.1	Revised	
10.3.2	Revised	
10.3.3	Revised	

10.3.3.1 10.3.3.2 10.3.3.3 10.3.3.4	Deleted	
Figure 10.22	Removed plane bracing	
10.3.4	Revised	
10.3.5	Revised	
C10.3.4 & C10.3.5	Deleted	
10.4.1	Revised	
10.4.1.1	Deleted	
10.4.1.2	Deleted	
10.4.2	Revised	
10.4.2.1	Revised	
10.4.2.2	Deleted	
10.4.2.3	Revised	
10.4.2.4	New	
10.4.3.1	Revised	
10.4.3.2(b)	Removed	
C10.4.3.2	Correction (b)	
Table 13(a)	Existing table given table number. No changes to table content	
10.4.3.3	Revised	
10.4.4	Revised	
Appendices	Tables - No1 / VSG 6 and VSG/MSG 10	
Other	Some discussion was raised regarding revising the fixing tables in to one table to get some consistency. NOTE – Please comment There is some inconsistency with fixings, currently all fixings including the alternative fixing capacities are specific to the table it is in. For example, fixing type A, B, or C may vary from one table to the next. There was some discussion on introducing one table that has all fixing details to be used for quick reference. Please comment on the usefulness of this single table. Currently table 10.1 from NZS3604:1999 has been revised, renumbered, and relocated to 10.3, leaving	Agree that a separate table with standardized fixings would be much clearer.
	an opening for such a new table to be inserted in place of table 10.1 for fixings and alternative fixing capacities. There is also some research being undertaken by NZRM and BRANZ on fixing capacity which should be available prior to the post-public comment meetings that may be of benefit. This information will be reviewed during the post-public comment meetings.	
Section 11	Section 11 to be deleted	We agree that Section 11 be transferred to E2/AS1 and believe that

		this transferal should be expedited so that the E2/AS1 revision is available as soon as the revised NZS3604 is published. This will allow the revised NZS3604 to be cited immediately in the NZBC.
Section 12	No changes proposed	
Section 13		
13.5.2	Revised (a) and (b)	
Section 14	3 kPa Floor loads	
Table 14.4	Tables revised	
Table 14.8	Tables revised	
Table 14.10	Tables revised	
Table 14.12	Tables revised	
Table 14.13	Tables revised	
Table 14.14	Tables revised	
Appendices	Tables - No1 / VSG 6 and VSG/MSG 10	
Section 15		
Figure 15.1	Altitudes changed to align with AS/NZS 1170	
Table 15.1	Revised	
Table 15.2	Revised	
Table 15.3	Revised	
Table 15.4	Revised	
Table 15.5	Revised	
Table 15.6	Revised	
Table 15.7	Revised	
Table 15.8	Revised	
Appendices	Tables - No1 / VSG 6 and VSG/MSG 10	
Section 16	No changes proposed	
Section 17	No changes proposed	
Section 18	No changes proposed	
Section 19	To be removed	
Section 20	To be removed	
Other		
		The Maps are too general and it can be guess work finding the right zone. It may be better for the TA's to notify the wind and corrosion zones especially where the property is close to a boundary between 2 zones (this information should be provided on the LIM Report). For corrosion the grain of the maps is too coarse and sites that are 1km from west coast beaches should have greater risk then sites that are adjacent to sheltered inland harbours with low wind exposure. It seems that corrosion could be better

		linked to a combination of sea roughness and wind exposure (building wind zone).
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