



Study Report

SR422 [2019]

# Physical characteristics of new houses 2018

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## Preface

This is the ninth annual report providing the results of the BRANZ New Dwellings Survey. BRANZ surveys builders of new dwellings on the physical characteristics of their buildings. The purpose is to obtain data on new housing that is not available from official sources. This data includes generic types of materials used by building component as well as design information such as number of floors, prefabrication and efficiency measures. The data is useful for studies in the fields of sustainability, energy efficiency, durability and engineering.

## Acknowledgements

We would like to thank all of the builders and designers who filled in the survey form and returned it to BRANZ.

# Physical characteristics of new houses 2018

## BRANZ Study Report SR422

### Authors

Orin Lockyer and Nick Brunson

### Reference

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### Abstract

Official data on the characteristics of new housing is very limited. Building consents data held by Statistics New Zealand gives numbers by building type, value and floor area, aggregated into territorial authorities. However, there is no data on materials used or housing characteristics beyond the floor area.

The BRANZ New Dwellings Survey dates back to 1998 and collects data on materials used in new housing. We have since compiled a database of approximately 1,200 new houses per year containing information on the materials used by building component and design arrangements.

This report contains the results of those surveys on the materials used in new housing. It updates previous data with the inclusion of the 2018 data set. The aim is to provide information useful to building material manufacturers, retailers/wholesalers, builders, designers, researchers and government officials.

### Keywords

Materials, building envelope, claddings, floors, framing, insulation.

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# 1. Introduction

BRANZ surveys 5,000 new residential buildings per year in the BRANZ New Dwellings Survey. This survey series started in 1998 and collects a variety of data on materials used in new housing.

The survey is a postal survey to the builder or designer identified on the building consent application form, and the questions relate to each individual consent. Generally, over 1,200 returns are received each year. An incentive is offered (a Lotto ticket, book voucher or reduced price on BRANZ publications) for the return of each survey form.

The consent information is obtained from the Whats On<sup>1</sup> building consent data. BRANZ uses this to determine a sample of new dwellings for each period from 31 territorial authorities. The territorial authorities surveyed are:

Auckland	Christchurch	Dunedin	Franklin
Far North	Gisborne	Hutt City	Hamilton
Invercargill	Kapiti	Manukau	Marlborough
Napier	New Plymouth	North Shore	Porirua
Palmerston North	Queenstown	Rodney	Southland
Tauranga	Thames-Coromandel	Tasman	Waikato
Waipa	Wellington	Western Bay of Plenty	Whangarei
Waitakere			

The survey form is constantly evolving to include new questions as required. However, it is important for BRANZ to keep the survey form as simple, concise and clear as possible. Therefore, BRANZ keeps the survey form to a single page.

BRANZ weights the responses by the share of building activity in each territorial authority (as indicated by building consents) in the calculation of the national market share. This prevents some territorial authorities from having a disproportionate share of the total market share should BRANZ receive a larger number of survey returns from one particular area. The results presented are only for new houses (i.e. single detached units). Using the data collected, representative estimates of the incidence and proportions of many different materials can be made. The components analysed are:

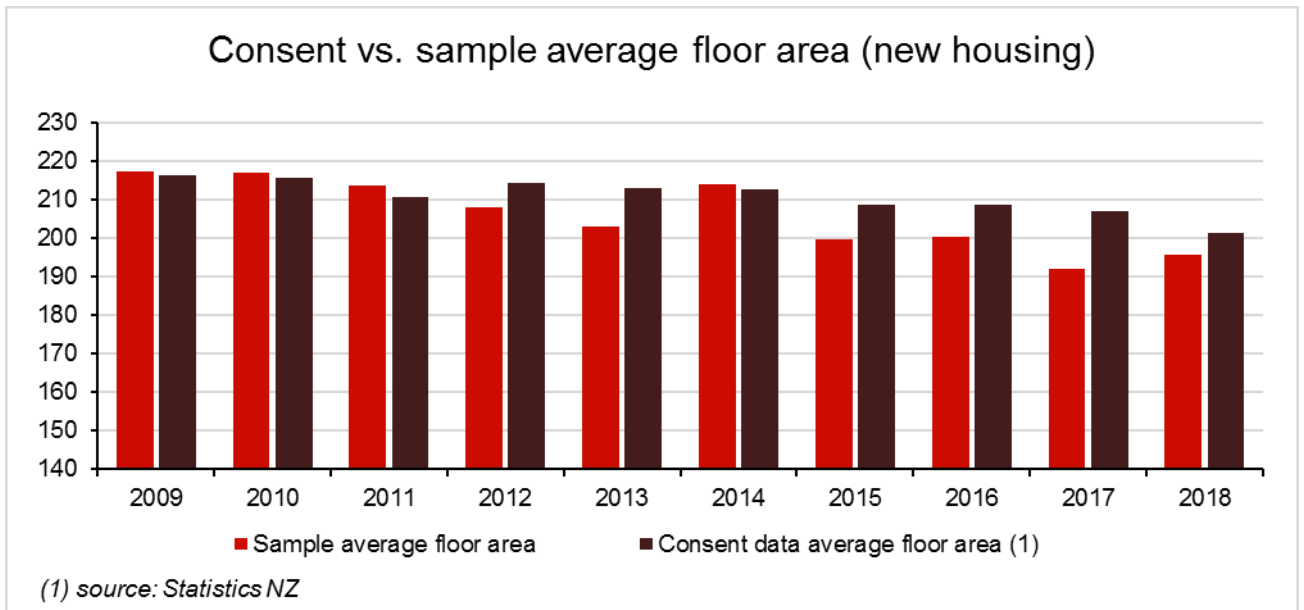
- roof claddings
- wall claddings
- wall framing
- number of storeys
- flooring
- floor joists
- insulation.

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<sup>1</sup> *Whats On report (Monthly)*. TF Stevens & Co Ltd, Auckland, New Zealand.

A limitation of the survey is that it does not ask why certain materials are selected. This means that the report contains no commentary on why material trends might be changing. It is also subject to sampling noise, which can cause short-term fluctuations that are at variance to long-term trends.

The average floor areas since 2006 are presented in Figure 1 to illustrate any bias that may be present in the results. The sample average floor area for 2018 is still slightly above the consent average floor area but closer than previous years.



**Figure 1. Consent versus sample average floor area.**

Some questions change from survey to survey. However, most have remained the same since the start to ensure a consistent data set for comparative purposes.

## 2. Summary

In general, many of the market shares of materials have been relatively steady over the years surveyed. Notable material trends include:

- steel roofing remains dominant and has experienced a slight uptick in market share
- weatherboard profiles remain the most common wall cladding, having recently overtaken bricks
- timber framing continues to hold a high market share, within which laminated veneer lumber (LVL) continues to grow.



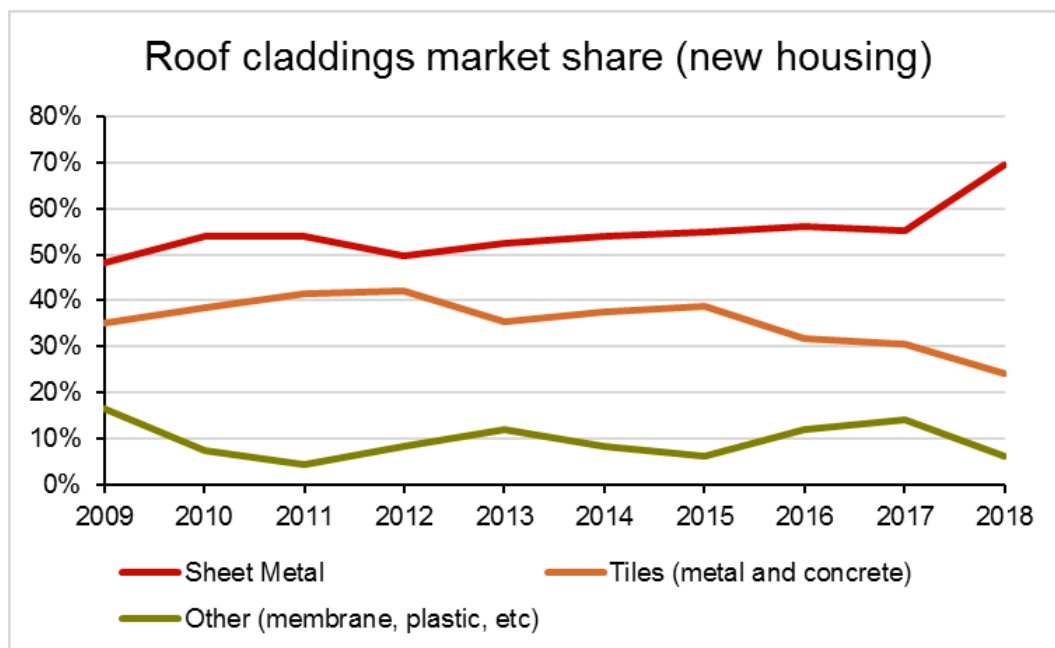
### 3. Main results

Key results are shown in the following charts. The data for these charts is in the tables in Appendix B.

#### 3.1 Roof claddings

Sheet metal is the dominant roof cladding material with its market share trending upwards since 2012 and experiencing a noticeable uptick in 2018 (Figure 2).

The share of tiles (both metal and concrete) continued to ease during 2018 as has the 'other' category. The 'other' category mostly consists of shingle and membrane roofing products.



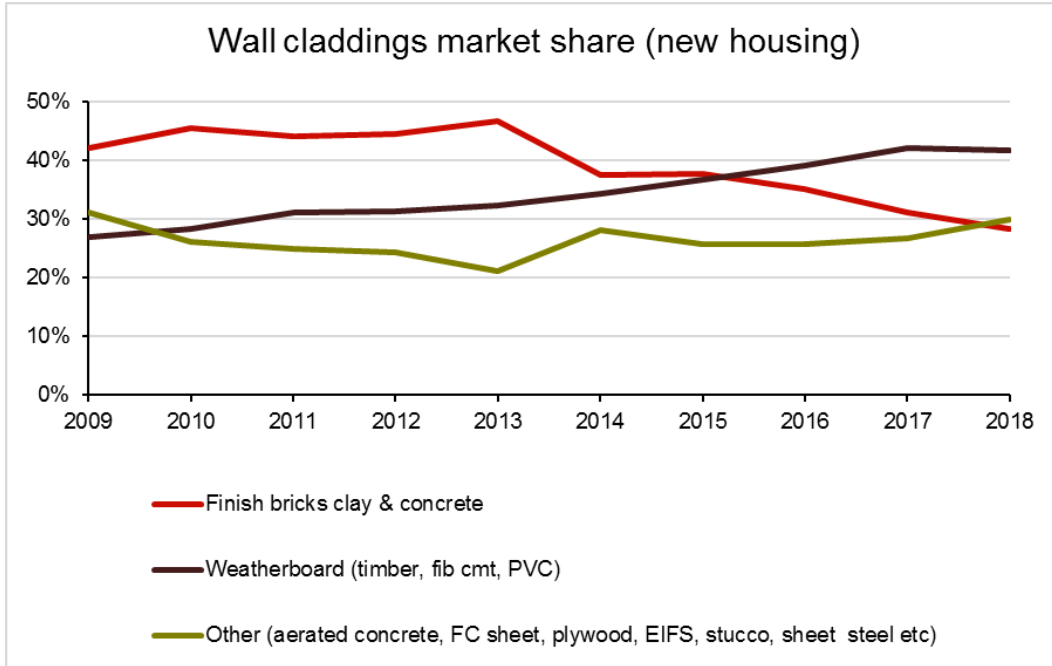
**Figure 2. Roof claddings market share.**

#### 3.2 Wall claddings

Finish bricks (both clay and concrete) continued their decline in share (Figure 3), slipping below the 'other' category in 2018, after falling behind timber weatherboards in 2017.

Weatherboard profiles remain the most common wall cladding, 59% of which are timber, with the remainder consisting of fibre-cement and uPVC.

Major constituents of the 'other' category are metal, non-weatherboard fibre-cement, exterior insulation and finish systems (EIFS) and aerated autoclaved concrete (AAC).

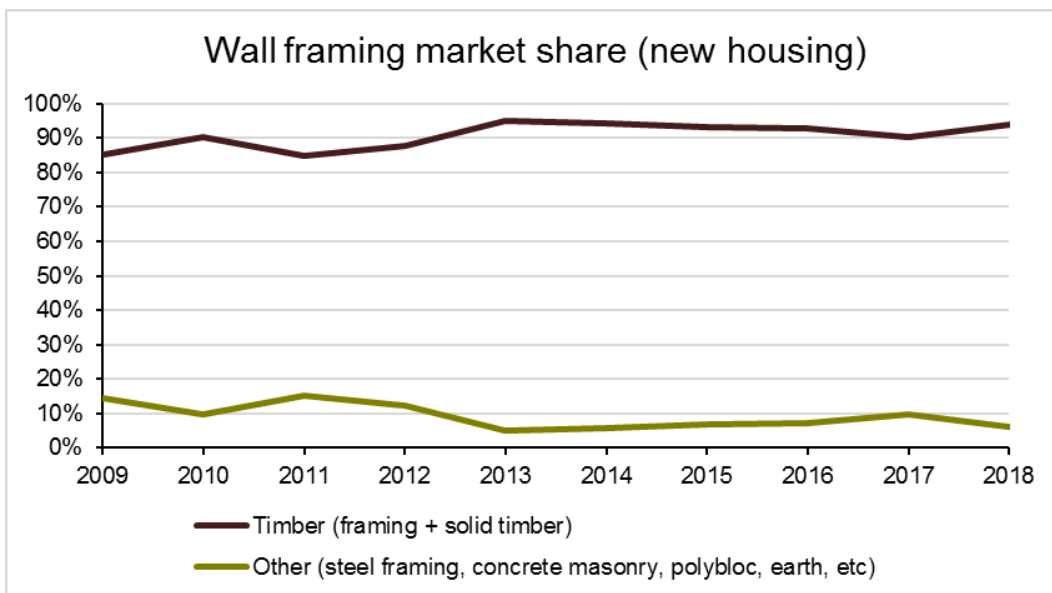


**Figure 3. Wall claddings market share.**

### 3.3 Wall framing

Timber framing remains the predominant structural material in new housing, with a historical market share of around 90% (Figure 4). This has eased slightly downwards over the past 4 years due to a slight increase in the use of concrete masonry, particularly for ground floors. However, the market has improved slightly for timber framing, which rebounded in 2018. LVL has been rapidly growing and now comprises around 10% of timber framing.

The majority (92%) of wall framing is precut or prenailed, which has held relatively steady over the past 4 years.



**Figure 4. Wall framing market share.**

### 3.4 Number of storeys

Figure 5 shows the proportion of new houses that were single storey, 2 storey or 3 or more storeys. Analysis was restricted to the 30 territorial authorities where we received four or more responses. The number in brackets beside the name of the territorial authority is the number of responses received. Notably, the greatest proportion of new houses built with 2 or more storeys were generally reported in areas with the higher land prices, such as Central Auckland, North Shore and Wellington. This reflects that higher land prices encourage greater intensity of development. Steeper terrain may also encourage multi-storey development – for example, in the case of Wellington.

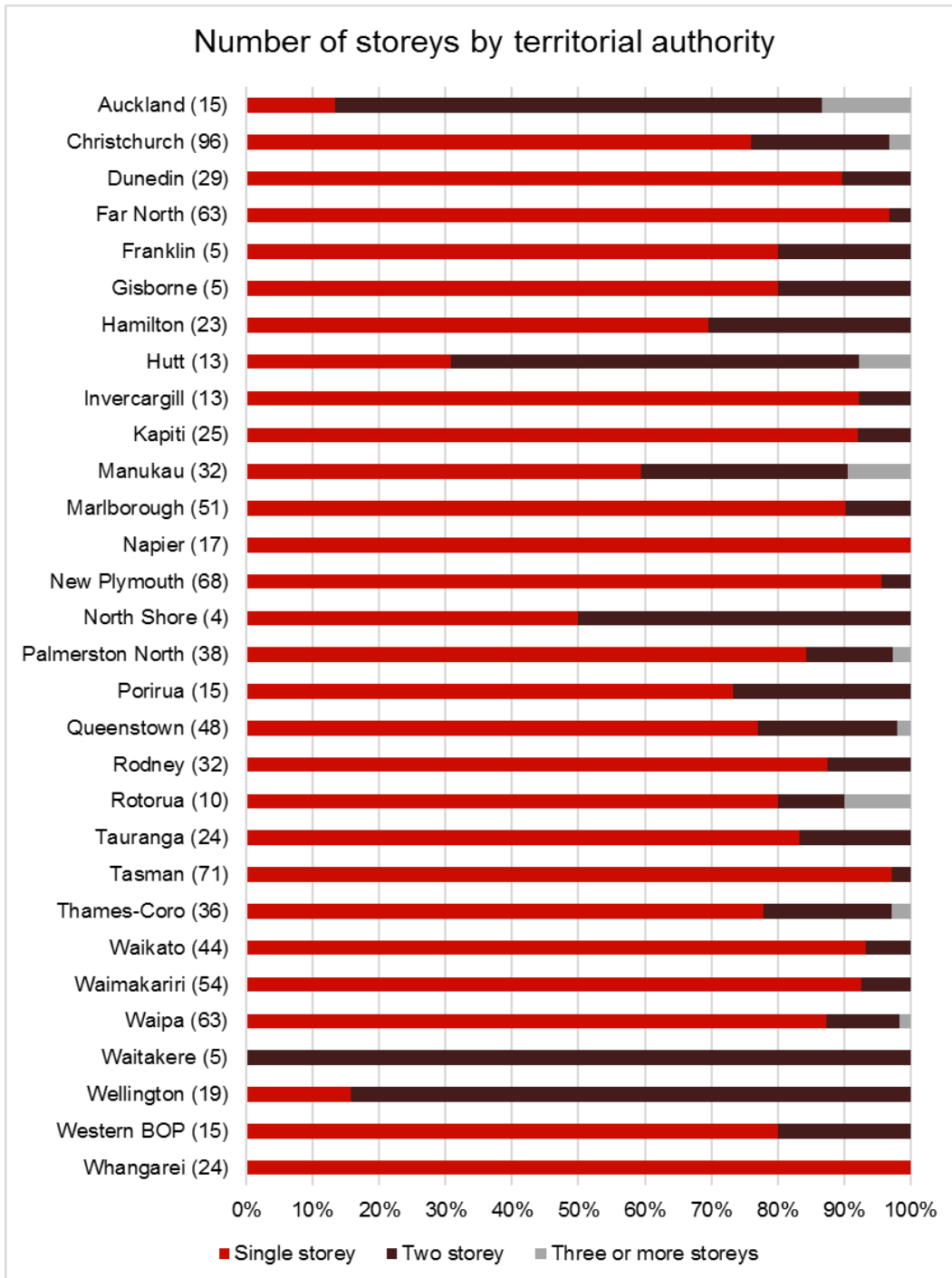


Figure 5. Number of storeys by territorial authority.

### 3.5 Flooring

Concrete flooring continued to trend downwards this year after a slight uptick in 2016, while 'all other flooring' continued to trend upwards towards 30% of the market share in new housing (Figure 6). 'All other flooring' is mostly particleboard and strand board. The percentages include upper floors (usually wood based) so are impacted by the trend towards multi-storey buildings, which made up 25% of new dwellings in 2018.

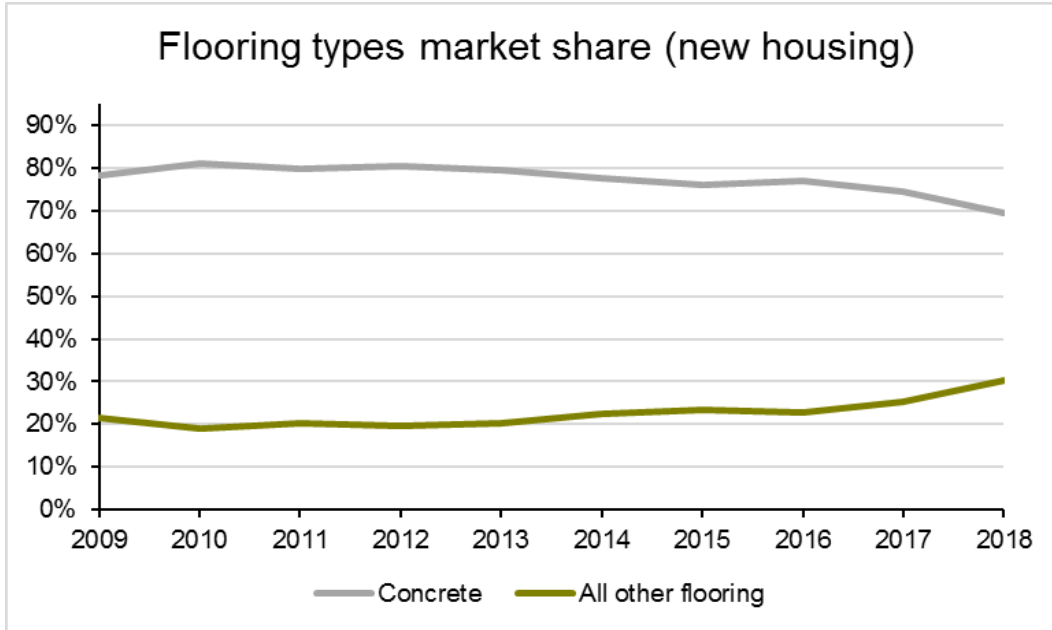


Figure 6. Flooring types market share.

### 3.6 Floor joists

Solid timber dominates the floor joists market but has lost market share in 2018 to the 'other' category. (Figure 7).The 'other' category primarily consists of various proprietary wood and steel composite joists and traditional heavy-gauge steel joists.

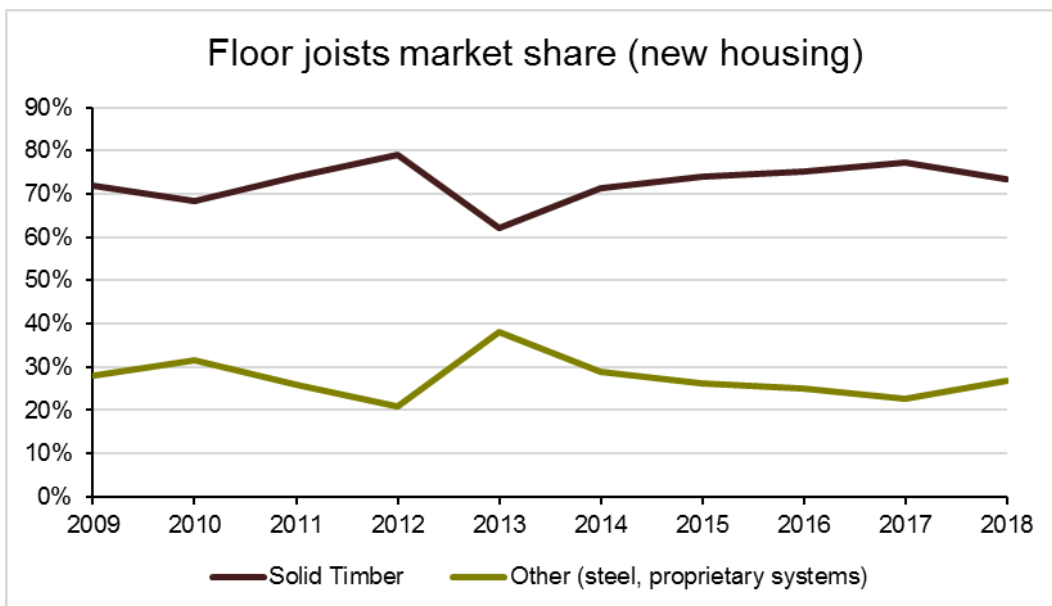


Figure 7. Floor joists market share.

### 3.7 Insulation

Wall insulation, ceiling insulation and floor insulation for concrete slabs and timber floors are dealt with separately in this section.

#### 3.7.1 Wall insulation

Fibreglass is the dominant wall insulation material (Figure 8). Its share is generally stable but has continued to ease in 2018. The 'other' category is mainly polyester insulation.

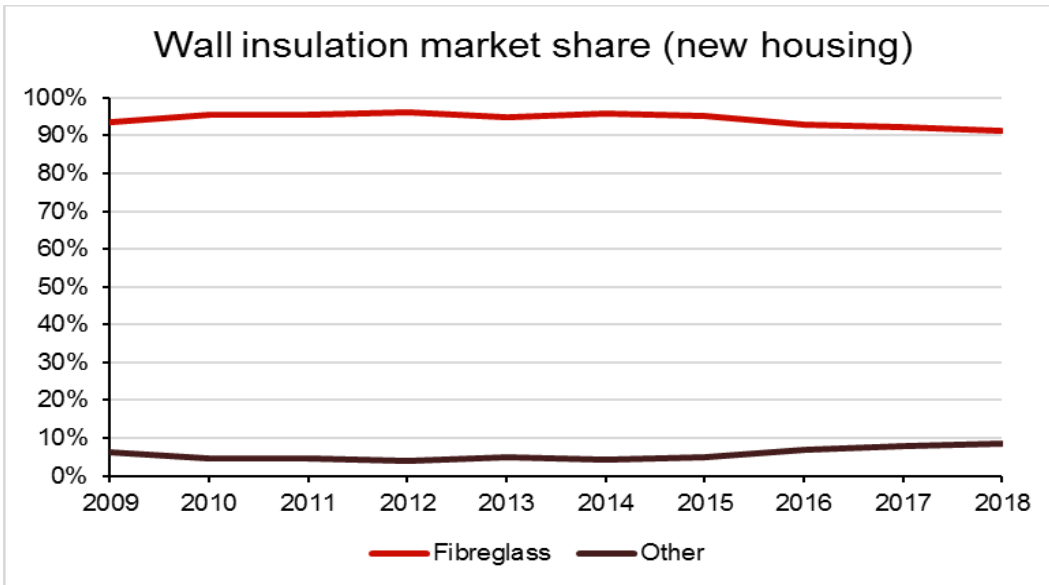


Figure 8. Wall insulation market share.

#### 3.7.2 Ceiling insulation

Fibreglass is also the dominant ceiling insulation material (Figure 9). It is common for builders to use the same type of material (and often the same brand) for the wall and ceiling. Therefore, market shares for wall and ceiling insulation tend to move together.

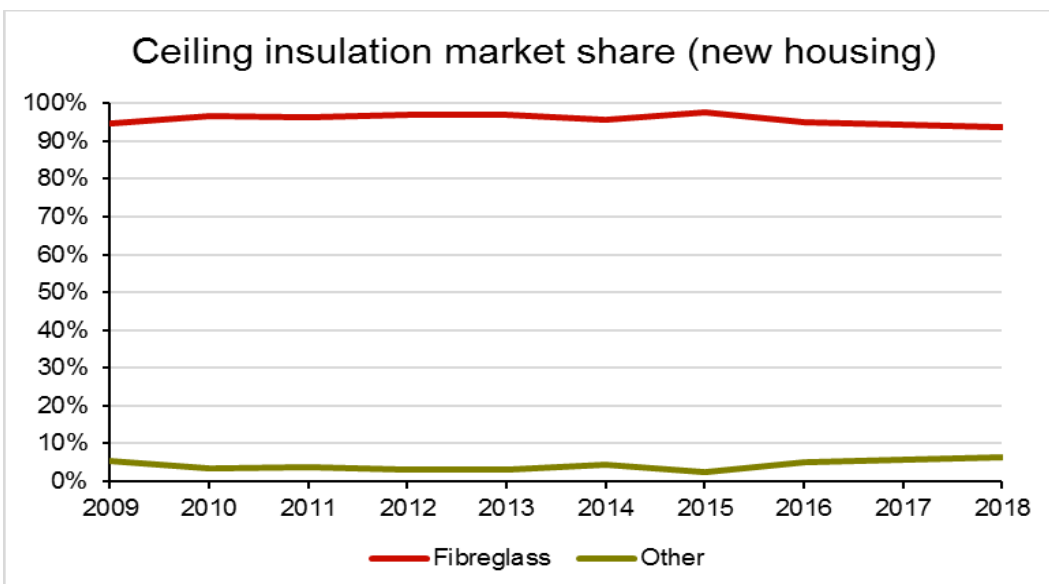
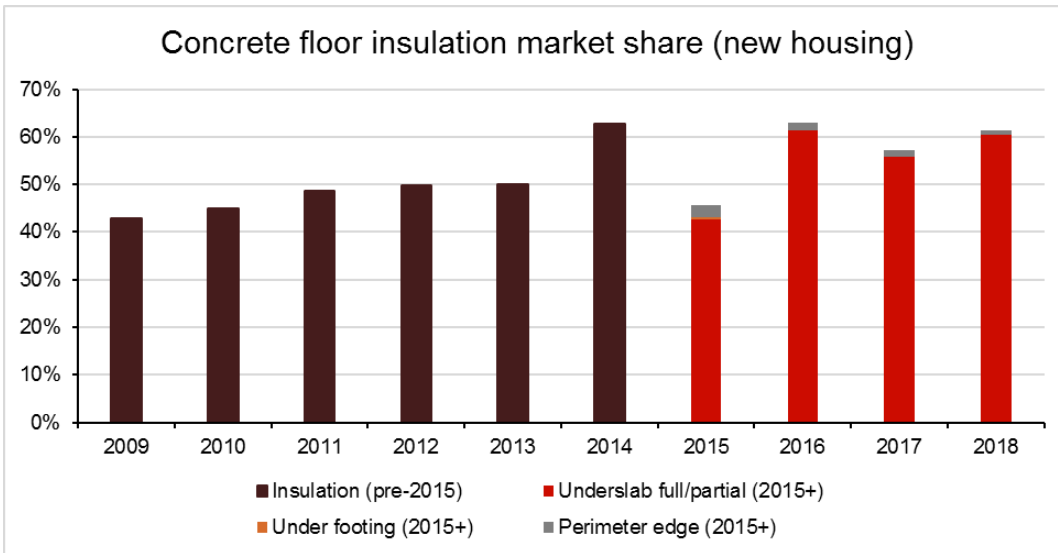


Figure 9. Ceiling insulation market share.

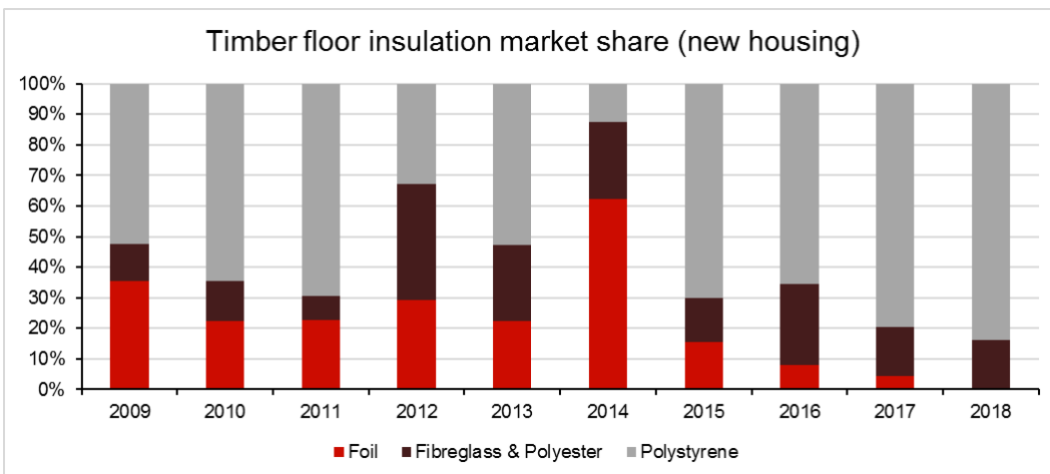
### 3.7.3 Floor insulation

In 2015, the question on insulation of concrete slabs was changed. We present the mix of insulation types used in 2015 against total insulation for the historical series in Figure 10. It will take further data with the new question to establish a trend for this series. Underslab full/partial insulation is the most common insulation for concrete slabs in new housing. Very few builders reported insulating the perimeter edge or under the slab footing.



**Figure 10. Concrete slab insulation.**

Timber subfloors are much less common than concrete slabs in new housing. Therefore, the shares presented in Figure 11 are susceptible to large swings given the use of timber floor insulation in new houses being limited. Polystyrene remains the dominant timber floor insulation material, followed by fibreglass and polyester. Meanwhile foil was non-existent as a timber floor insulator in 2018, following a ban in 2016<sup>2</sup> and a trend of steady decline since 2014.



**Figure 11. Timber floor insulation market share.**

<sup>2</sup> <https://www.building.govt.nz/assets/Uploads/building-code-compliance/warnings-bans/201601-Foil-insulation-ban.pdf>

# Appendix A: Survey forms

## A.1 Survey form October 2006

NEW DWELLING									
Please give this form to the builder or designer to fill out for the building consent listed over the page.									
Number of dwelling units <input type="text"/> in this consent.					Contract value of work (incl sub-trades) \$ ..... ind GST.				
<b>Floor areas</b> Total floor area _____ Sq metres (include attached garage, exclude decks).									
<b>Strip timber (not overlay, exclude decks).</b>									
	Particleboard		Plywood		Strip timber (not overlay, exclude decks).			Concrete	
Ground level	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres
First level	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres
2nd or more levels	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres
<b>Decks (above ground, not concrete patios) (circle one)</b>									
Deck area _____ Sq metres					Includes a deck? Yes / No (circle one or more)				
Deck surface material = radiata/hardwood/butyl/tiles/other/ pour-on. Deck substrate = plywood sht/ fibre cement sht/ concrete/ timber joists.									
<b>Wall Framing</b> (tick appropriate box)									
Radiata <input type="checkbox"/>		Steel <input type="checkbox"/>		Douglas fir <input type="checkbox"/>		Concrete block <input type="checkbox"/>		Other <input type="checkbox"/> (state) .....	
Was the wall framing precut or prenailed? Yes / No (circle one)									
<b>Framing timber treatment</b> Untreated kiln dry Untreated wet H1.2 T1.2 (orange) H3.1									
Tick one or more <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>									
State where used (eg outer walls, sub floor, etc) .....									
<b>Floor joists</b>									
None <input type="checkbox"/>		Solid timber <input type="checkbox"/>		Posistrut <input type="checkbox"/>		Hybeam (I beam) <input type="checkbox"/>		Steel <input type="checkbox"/>	
Twinplate <input type="checkbox"/>		Origin (I beam) <input type="checkbox"/>		Other (state) <input type="checkbox"/>					
Tick one or more Joist depth mm .....mm .....mm .....mm .....mm .....mm .....mm .....mm									
<b>Insulation</b> (tick one or more)									
R value of insulation		Pink Batts <input type="checkbox"/>		Bradford Gold <input type="checkbox"/>		Premier Fibreglass <input type="checkbox"/>		Blown FG Roofwool <input type="checkbox"/>	
Greenstuf (polyester) <input type="checkbox"/>		Other polyester <input type="checkbox"/>		Treated paper <input type="checkbox"/>		Wool <input type="checkbox"/>		Other (state) <input type="checkbox"/>	
Wall insulation R- <input type="checkbox"/>		Ceiling insulation R- <input type="checkbox"/>		Floor insulation R- <input type="checkbox"/>					
Expol Warmflex <input type="checkbox"/>		Polystyrene panel <input type="checkbox"/>		Cosy Floor <input type="checkbox"/>		Sisalation Foil <input type="checkbox"/>		Other (state) <input type="checkbox"/>	
Installer (name) .....									
<b>Noise Control</b> (circle one)									
Have you installed noise control products? Yes / No What type? .....									
<b>Building wraps</b>									
Roof wrap <input type="checkbox"/>		Flamestop <input type="checkbox"/>		Thermakraft <input type="checkbox"/>		Bitumac <input type="checkbox"/>		GIB underlay <input type="checkbox"/>	
Greenwrap <input type="checkbox"/>		Pauloid <input type="checkbox"/>		Black Paper <input type="checkbox"/>		Other (state) <input type="checkbox"/>			
(tick one or more)									
Wall wrap <input type="checkbox"/>		Flamestop <input type="checkbox"/>		Tyvek <input type="checkbox"/>		Thermakraft coverup <input type="checkbox"/>		Framegard II <input type="checkbox"/>	
Greenwrap <input type="checkbox"/>		Fastwrap <input type="checkbox"/>		Black Paper <input type="checkbox"/>		Other (state) <input type="checkbox"/>			
<b>Wall cladding</b> State type (and approx % wall coverage)									
Type .....		% area .....		eg fibre cement sheet, 75%			also plywood, solid plaster (min 18mm),		
Type .....		% area .....		daybrick, 15%			plaster on polystyrene, concrete		
Type .....		% area .....		cedar 10%			block, PVC weatherboard, etc.		
If yes to Fibre Cement cladding what is the Manufacturer? (tick one or more) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>									
Fibre Cement Product used as (Circle one or more) Applied texture finish sheet Flat sheet FC plank FC weatherboard/Linea									
If solid plaster, what backing? (circle one if solid plaster) fibre cement, plywood, paper, Triple S, block/brick, metal lathe									
<b>Roof cladding</b> Type ..... (or circle one)									
eg metal tiles, pre-painted corrugated, other steel profiles, concrete tiles, butyl asphalt shingles, fibreglass shingles, etc.									
<b>Wet wall linings</b> (Tick one or more in each row)									
Fornica Aquapanel <input type="checkbox"/>		Seratone <input type="checkbox"/>		Villa board <input type="checkbox"/>		Hardies <input type="checkbox"/>		Standard GB <input type="checkbox"/>	
GIB Aqualine <input type="checkbox"/>		Other <input type="checkbox"/>		(state) .....					
Bathroom <input type="checkbox"/>		Laundry <input type="checkbox"/>							
Is fibre cement sheet flooring underlay used in the bathroom or laundry? Yes/ No (circle one).									
<b>Energy efficiency</b> Tick if any of the following are being installed:									
Double glazing <input type="checkbox"/>		Solar water heaters <input type="checkbox"/>		Dual flush toilets <input type="checkbox"/>		efficient lights <input type="checkbox"/>		Energy Heat pump <input type="checkbox"/>	
Low flow showers <input type="checkbox"/>		Built-in window vents <input type="checkbox"/>							
<b>Type of Builder</b> How many houses or dwelling units does your company build per year (approx) .....									
<b>Construction Delays</b> If you signed a contract with the owner now, how many weeks before on-site work would start? ..... wks									



## A.2 Survey form October 2010

<b>NEW DWELLING</b>																																																									
<b>Please give this form to the builder or designer to fill out for the building consent listed over the page.</b> Number of dwelling units <input type="text"/> in this consent. Contract value of work (incl sub-trades) \$ ..... incl GST.																																																									
<b>Floor areas</b> Total floor area _____ Sq metres (include attached garage, exclude decks). <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;"></th> <th style="width: 25%;">Particleboard</th> <th style="width: 25%;">Plywood</th> <th style="width: 25%;">Strip timber (not overlay, exclude decks).</th> <th style="width: 25%;">Concrete</th> </tr> <tr> <td>Ground level</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> </tr> <tr> <td>First level</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> </tr> <tr> <td>2nd or more levels</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> <td>_____ Sq metres</td> </tr> </table>									Particleboard	Plywood	Strip timber (not overlay, exclude decks).	Concrete	Ground level	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	First level	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres	2nd or more levels	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres																														
	Particleboard	Plywood	Strip timber (not overlay, exclude decks).	Concrete																																																					
Ground level	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres																																																					
First level	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres																																																					
2nd or more levels	_____ Sq metres	_____ Sq metres	_____ Sq metres	_____ Sq metres																																																					
<b>Building Envelope Risk Score and Wind Zone</b> What is the risk score (enter score for EACH elevation) North <input type="text"/> West <input type="text"/> South <input type="text"/> East <input type="text"/> What is the wind zone (tick one box) Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Very High <input type="checkbox"/>																																																									
<b>Wall Framing</b> (tick appropriate box) Radiata <input type="checkbox"/> Steel <input type="checkbox"/> Douglas fir <input type="checkbox"/> Concrete block <input type="checkbox"/> Solid wood <input type="checkbox"/> Other <input type="checkbox"/> (state) ..... Was the wall framing precut or prenailed? Yes / No (circle one)																																																									
<b>Stud size and spacing</b> (tick one or more) <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%;">90x45 mm @600ctrs</td> <td style="width: 12.5%;">90x40 mm @600ctrs</td> <td style="width: 12.5%;">90x45 mm @400ctrs</td> <td style="width: 12.5%;">90x40 mm @400ctrs</td> <td style="width: 12.5%;">140x45 mm @600ctrs</td> <td style="width: 12.5%;">140x45 mm @400ctrs</td> <td style="width: 12.5%;">Other (please state) _____</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>								90x45 mm @600ctrs	90x40 mm @600ctrs	90x45 mm @400ctrs	90x40 mm @400ctrs	140x45 mm @600ctrs	140x45 mm @400ctrs	Other (please state) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																				
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																			
<b>Heating Systems</b> Tick one or more Heat pump <input type="checkbox"/> Wood/Pellet burner <input type="checkbox"/> Ducted central heating (Not including DVS or HRV) <input type="checkbox"/> Underfloor heating (waterpipe) <input type="checkbox"/> Underfloor heating (electric) <input type="checkbox"/> DVS/HRV <input type="checkbox"/> Gas <input type="checkbox"/>																																																									
<b>Floor joists</b> Tick one or more <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%;">None</td> <td style="width: 12.5%;">Solid timber</td> <td style="width: 12.5%;">Posistrut</td> <td style="width: 12.5%;">Hyoist</td> <td style="width: 12.5%;">Steel</td> <td style="width: 12.5%;">Twinaplate</td> <td style="width: 12.5%;">Hyne (I beam)</td> <td style="width: 12.5%;">lumberworX</td> <td style="width: 12.5%;">Other (state)</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Joist depth</td> <td>.....mm</td> <td>.....mm</td> <td>.....mm</td> <td>.....mm</td> <td>.....mm</td> <td>.....mm</td> <td>.....mm</td> <td>.....mm</td> </tr> </table>								None	Solid timber	Posistrut	Hyoist	Steel	Twinaplate	Hyne (I beam)	lumberworX	Other (state)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Joist depth	.....mm	.....mm	.....mm	.....mm	.....mm	.....mm	.....mm	.....mm																							
None	Solid timber	Posistrut	Hyoist	Steel	Twinaplate	Hyne (I beam)	lumberworX	Other (state)																																																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																	
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<b>Insulation</b> (tick one or more) <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 12.5%;">Insulation R value</th> <th style="width: 12.5%;">Pink Batts</th> <th style="width: 12.5%;">Bradford Gold</th> <th style="width: 12.5%;">Premier Fibreglass</th> <th style="width: 12.5%;">Blown FG Rocwool</th> <th style="width: 12.5%;">Greenstuf (polyester)</th> <th style="width: 12.5%;">Other polyester</th> <th style="width: 12.5%;">Wool</th> <th style="width: 12.5%;">Polystyrene</th> <th style="width: 12.5%;">Other (state)</th> </tr> <tr> <td>Wall insulation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Ceiling insulation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Floor insulation</td> <td><input type="checkbox"/></td> <td>Expol Warmfeet <input type="checkbox"/></td> <td>Polystyrene (NOT polythene) Under slab <input type="checkbox"/></td> <td>Snug Floor <input type="checkbox"/></td> <td>Sisalation Foil <input type="checkbox"/></td> <td>Ribraft Floor <input type="checkbox"/></td> <td>Cupotex <input type="checkbox"/></td> <td>Other (state) <input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Insulation installer (name) Please tick</td> <td><input type="checkbox"/></td> <td>Builder <input type="checkbox"/></td> <td>Other, please specify <input type="checkbox"/></td> <td colspan="6"></td> </tr> </table>								Insulation R value	Pink Batts	Bradford Gold	Premier Fibreglass	Blown FG Rocwool	Greenstuf (polyester)	Other polyester	Wool	Polystyrene	Other (state)	Wall insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ceiling insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Floor insulation	<input type="checkbox"/>	Expol Warmfeet <input type="checkbox"/>	Polystyrene (NOT polythene) Under slab <input type="checkbox"/>	Snug Floor <input type="checkbox"/>	Sisalation Foil <input type="checkbox"/>	Ribraft Floor <input type="checkbox"/>	Cupotex <input type="checkbox"/>	Other (state) <input type="checkbox"/>	<input type="checkbox"/>	Insulation installer (name) Please tick	<input type="checkbox"/>	Builder <input type="checkbox"/>	Other, please specify <input type="checkbox"/>						
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<b>Roof cladding</b> Type _____ (or circle one) eg metal tiles, pre-painted corrugated, other steel profiles, concrete tiles, butyl, asphalt shingles, fibreglass shingles, etc. If roof is metal tiles, specify Manufacturer name _____ Is the Majority of the roof slope: (tick one) Greater/equal than 12 degrees <input type="checkbox"/> less than 12 degrees <input type="checkbox"/> Don't know <input type="checkbox"/>																																																									
<b>Wet wall linings</b> (Tick one or more in each row) <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%;"></td> <td style="width: 12.5%;">Formica Aquapanel</td> <td style="width: 12.5%;">Seratone</td> <td style="width: 12.5%;">Villaboard</td> <td style="width: 12.5%;">Hardies</td> <td style="width: 12.5%;">Hardiglaze</td> <td style="width: 12.5%;">Standard GIB</td> <td style="width: 12.5%;">GIB Aqualine</td> <td style="width: 12.5%;">Other, specify</td> <td style="width: 12.5%;">Timber</td> <td style="width: 12.5%;">Horizon</td> </tr> <tr> <td><b>Bathroom</b></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><b>Laundry</b></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> Is fibre cement sheet flooring underlay used in the bathroom or laundry? Yes/ No (circle one)									Formica Aquapanel	Seratone	Villaboard	Hardies	Hardiglaze	Standard GIB	GIB Aqualine	Other, specify	Timber	Horizon	<b>Bathroom</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Laundry</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
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Thank You. Please fold this form, and freepost it in the return envelope <span style="float: right;">Oct-10</span>																																																									



## A.3 Survey form October 2015

<b>NEW DWELLING</b>										
Please give this form to the builder or designer to fill out for the building consent listed over the page.										
Number of dwelling units in this consent <input type="text"/>				Contract value of work (incl sub-trades) \$.....			Incl GST.			
Was this dwelling designed by a registered architect? Yes / No (circle one)										
Floor Areas and Ceiling Height Total Floor Area <input type="text"/> Sq metres (include attached garage, exclude decks).										
		Partideboard			Plywood		Strip timber (not overlay exclude decks)		Strandboard	
Ground level		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m		Concrete <input type="text"/> Sq m
First level		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m
2nd or more levels		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m		<input type="text"/> Sq m
Height of level to ceiling <input type="text"/> metres										
Wall Framing (tick appropriate box)										
Radiata <input type="checkbox"/>		Steel <input type="checkbox"/>		Douglas Fir <input type="checkbox"/>		Concrete Block <input type="checkbox"/>		Solid Wood <input type="checkbox"/>		Other <input type="checkbox"/> (state).....
Was the wall framing precut or prenailed? Yes / No (circle one)										
How soon after being issued the consent will you have stood the house framing?										
0-3 months <input type="checkbox"/>		4-6 months <input type="checkbox"/>		7-9 months <input type="checkbox"/>		10-12 months <input type="checkbox"/>		Over 12 months <input type="checkbox"/>		
Floor Joists (tick one or more)										
None <input type="checkbox"/>		Timber <input type="checkbox"/>		Posistrut <input type="checkbox"/>		Hyjoist <input type="checkbox"/>		Steel <input type="checkbox"/>		Twinaplate <input type="checkbox"/>
		Hyne (I beam) <input type="checkbox"/>		LumberwoX <input type="checkbox"/>		Other state <input type="checkbox"/>				
Joist depth: <input type="text"/> mm										
Insulation (tick one or more)										
Insulation R Value <input type="text"/>		Pink Batts <input type="checkbox"/>		Bradford Gold <input type="checkbox"/>		Premier <input type="checkbox"/>		Knauf Earthwool <input type="checkbox"/>		Autex Greenstuf <input type="checkbox"/>
Wall insulation <input type="checkbox"/>		Other <input type="checkbox"/>		Polyester <input type="checkbox"/>		Wool <input type="checkbox"/>		Polystyrene <input type="checkbox"/>		Other (state).....
Ceiling insulation <input type="checkbox"/>										
Is the floor insulated? (circle one) Yes / No										
If yes, what floor insulation was used?		Concrete slab insulation				Timber sub-floor insulation				
Floor insulation <input type="checkbox"/>		Underslab full/partial <input type="checkbox"/>		Perimeter edge <input type="checkbox"/>		Under footing <input type="checkbox"/>		Polystyrene <input type="checkbox"/>		Polyester <input type="checkbox"/>
		Glasswool <input type="checkbox"/>		Foil <input type="checkbox"/>						
Insulation Installer (name) <input type="text"/>										
Noise Control										
Have you installed noise control products? (circle one) Yes / No		If so, then what type? (tick all that apply)		Pink Batts Silencer <input type="checkbox"/>		GIB Noiseline <input type="checkbox"/>		Other GIB Products <input type="checkbox"/>		Bradford Gold <input type="checkbox"/>
				Pink Batts <input type="checkbox"/>		Polyester <input type="checkbox"/>				
Other (please specify) .....										
Building Wraps										
Flamestop <input type="checkbox"/>		Bitumac <input type="checkbox"/>		Tyvek Supro <input type="checkbox"/>		CoverTek <input type="checkbox"/>		Thermakraft <input type="checkbox"/>		Fastwrap <input type="checkbox"/>
Roof Wrap <input type="checkbox"/>		Pauloid <input type="checkbox"/>		Other (state).....						
(tick one or more) Bitumac <input type="checkbox"/> Tyvek Homevra <input type="checkbox"/> Watergate <input type="checkbox"/> Covertek <input type="checkbox"/> Thermakraft <input type="checkbox"/> Tekton <input type="checkbox"/> Fastwrap <input type="checkbox"/> Pauloid <input type="checkbox"/> Ecoply Barrier <input type="checkbox"/> Other (state).....										
Wall Wrap <input type="checkbox"/>										
DPC										
What DPC products have you installed?		Damp-a-thene <input type="checkbox"/>		Malthoid <input type="checkbox"/>		Supercourse <input type="checkbox"/>		Other, Specify: <input type="text"/>		
Flashing Tapes										
What flashing tapes are installed?		Bulldog <input type="checkbox"/>		Aluband <input type="checkbox"/>		Tyvek Flexwrap <input type="checkbox"/>		Protectowrap <input type="checkbox"/>		Frameflash <input type="checkbox"/>
		Other, Specify: <input type="text"/>								
Wall Cladding										
State type and approximate % wall coverage		e.g. Fibre cement sheet, 75% Other examples include: plywood sheet, plaster on claybrick, steel zincalum, fibre cement plank, Clay Brick, 15% glazing, EIFS, aerote concrete panel, radiata WB, linea WB etc. Cedar WB, 10%								
Type .....		% area .....		Type .....		% area .....		Type .....		% area .....
If Fibre Cement product, what is it used as? (circle one) Applied texture finish sheet, Flat sheet, Linea (16mm), FC plank (7.5mm)										
Roof Cladding										
What roof cladding was used? (circle one or state below)										
metal tiles, corona shake, preprinted corrugated, trough zincalum, corrugated zincalum, other steel profiles, concrete tiles, asphalt shingles, butyl, other (state) .....										
Spouting										
What profile is the SPOUTING?										
¼ round/quad <input type="checkbox"/>		½ round <input type="checkbox"/>		Old gothic <input type="checkbox"/>		Box <input type="checkbox"/>		Other (state).....		
What material is the SPOUTING?										
PVC (White) <input type="checkbox"/>		PVC (Colour) <input type="checkbox"/>		Steel <input type="checkbox"/>		Aluminium <input type="checkbox"/>		Copper <input type="checkbox"/>		Other (state).....
Who installed the SPOUTING?										
Roofer <input type="checkbox"/>		Spouting installer <input type="checkbox"/>		Builder <input type="checkbox"/>		Plumber <input type="checkbox"/>		Other (state).....		
Downpipes										
What profile are the DOWNPIPES?										
65mm round <input type="checkbox"/>		80mm round <input type="checkbox"/>		100mm round <input type="checkbox"/>		65x50mm rectangular <input type="checkbox"/>		100x50mm rectangular <input type="checkbox"/>		Other (state).....
What material are the DOWNPIPES?										
PVC (White) <input type="checkbox"/>		PVC (Colour) <input type="checkbox"/>		Steel <input type="checkbox"/>		Aluminium <input type="checkbox"/>		Copper <input type="checkbox"/>		Other (state).....
Who installed the DOWNPIPES?										
Roofer <input type="checkbox"/>		Spouting installer <input type="checkbox"/>		Builder <input type="checkbox"/>		Plumber <input type="checkbox"/>		Other (state).....		
Wet Wall Linings (tick one or more in each row)										
Bathroom		Formica Aquapanel <input type="checkbox"/>		Seratone <input type="checkbox"/>		Villaboard <input type="checkbox"/>		Hardies <input type="checkbox"/>		Standard <input type="checkbox"/>
		GIB Aqualine <input type="checkbox"/>		WaterShield <input type="checkbox"/>		Other specify <input type="text"/>		Timber <input type="checkbox"/>		Horizon <input type="checkbox"/>
Laundry		Formica Aquapanel <input type="checkbox"/>		Seratone <input type="checkbox"/>		Villaboard <input type="checkbox"/>		Hardies <input type="checkbox"/>		Standard <input type="checkbox"/>
		GIB Aqualine <input type="checkbox"/>		WaterShield <input type="checkbox"/>		Other specify <input type="text"/>		Timber <input type="checkbox"/>		Horizon <input type="checkbox"/>
Wall Linings (excluding wet walls)										
Elephant Plasterboard <input type="checkbox"/>		GIB Plasterboard <input type="checkbox"/>		Knauf Plasterboard <input type="checkbox"/>		Other (state).....				
Ceiling Linings and Battens										
Ceiling Linings (tick one or more)		10mm plasterboard <input type="checkbox"/>		13mm plasterboard <input type="checkbox"/>		Ultraline <input type="checkbox"/>		Tiles <input type="checkbox"/>		Other <input type="checkbox"/>
Ceiling Battens (circle one): timber or metal										
Are there any downlights recessed in to ceiling? Yes / No (circle one)		IF YES, how many? .....								
Thank You. Please fold this form, and freepost it in the return envelope										
									Oct-15	

## Appendix B: Tables of data for the charts

**Table 1. Roof claddings market share.**

Roof claddings market share in new housing										
Yearly Data 2009-2018										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sheet Metal	48.3%	53.8%	53.9%	49.6%	52.6%	54.0%	54.9%	56.1%	55.2%	68.7%
Tiles (metal and concrete)	35.0%	38.6%	41.6%	42.1%	35.4%	37.6%	38.8%	31.7%	30.6%	24.0%
Other (membrane, plastic, etc)	16.7%	7.6%	4.5%	8.3%	12.0%	8.4%	6.2%	12.2%	14.1%	7.3%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Note: percentage weighted to allow for the regional building activity.

**Table 2. Wall claddings market share.**

Wall claddings market share in new housing										
Yearly Data 2009-2018										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Finish bricks clay & concrete	42.1%	45.5%	44.0%	44.5%	46.6%	37.6%	37.6%	35.2%	31.2%	28.3%
Weatherboard (timber, fib cmt, PVC)	26.8%	28.3%	31.2%	31.3%	32.2%	34.3%	36.6%	39.1%	42.0%	40.1%
Other (aerated concrete, FC sheet, plywood, EIFS, stucco, sheet steel etc)	31.1%	26.2%	24.8%	24.2%	21.2%	28.1%	25.8%	25.7%	26.8%	31.6%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Note: percentage weighted to allow for the regional building activity.

**Table 3. Wall framing market share.**

Wall framing market share in new housing										
Yearly Data 2009-2018										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Timber (framing + solid timber)	85.4%	90.4%	84.7%	87.8%	95.0%	94.4%	93.1%	92.7%	90.2%	93.9%
Other (steel framing, concrete masonry, polybloc, earth, etc)	14.6%	9.6%	15.3%	12.2%	5.0%	5.6%	6.9%	7.3%	9.8%	6.1%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Note: percentage weighted to allow for the regional building activity.

**Table 4. Flooring types market share.**

Flooring types market share in new housing										
Yearly Data 2009-2018										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Concrete	78.4%	81.0%	79.7%	80.4%	79.6%	77.6%	76.0%	77.1%	74.4%	69.6%
All other flooring	21.6%	19.0%	20.3%	19.6%	20.4%	22.4%	23.5%	22.9%	25.3%	30.4%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Note: percentage weighted to allow for the regional building activity.

**Table 5. Floor joists market share.**

Floor joists market share in new housing										
Yearly Data 2009-2018										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Solid Timber	72.0%	68.4%	74.0%	79.0%	62.0%	71.2%	73.9%	75.1%	77.3%	73.3%
Other (steel, proprietary systems)	28.0%	31.6%	26.0%	21.0%	38.0%	28.8%	26.1%	24.9%	22.7%	26.7%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Note: percentage weighted to allow for the regional building activity.

**Table 6. Wall insulation market share.**

<b>Wall insulation market share in new housing</b>										
<b>Yearly Data 2009-2018</b>										
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Fibreglass</b>	93.7%	95.4%	95.5%	96.1%	95.0%	95.7%	95.1%	93.1%	92.1%	91.3%
<b>Other</b>	6.3%	4.6%	4.5%	3.9%	5.0%	4.3%	4.9%	6.9%	7.9%	8.7%
<b>TOTAL</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: percentage weighted to allow for the regional building activity.

**Table 7. Ceiling insulation market share.**

<b>Ceiling insulation market share in new housing</b>										
<b>Yearly Data 2009-2018</b>										
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Fibreglass</b>	94.6%	96.7%	96.2%	96.9%	97.0%	95.7%	97.5%	94.8%	94.4%	93.6%
<b>Other</b>	5.4%	3.3%	3.8%	3.1%	3.0%	4.3%	2.5%	5.2%	5.6%	6.4%
<b>TOTAL</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: percentage weighted to allow for the regional building activity.

**Table 8. Concrete slab waffle pod and sheet polystyrene use.**

<b>Concrete floor insulation in new housing</b>										
<b>Yearly Data 2009-2018</b>										
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Insulation (pre-2015)</b>	42.9%	45.0%	48.6%	49.8%	50.0%	62.8%				
<b>Underslab full/partial (2015+)</b>							42.7%	61.5%	55.9%	60.3%
<b>Under footing (2015+)</b>							0.3%	0.0%	0.0%	0.0%
<b>Perimeter edge (2015+)</b>							2.7%	1.4%	1.2%	1.0%
<b>TOTAL</b>	42.9%	45.0%	48.6%	49.8%	50.0%	62.8%	45.7%	62.9%	57.1%	61.3%

Note: percentage weighted to allow for the regional building activity.

**Table 9. Timber floor insulation market share.**

<b>Timber floor insulation market share in new housing</b>										
<b>Yearly Data 2009-2018</b>										
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Foil</b>	35.5%	22.3%	22.6%	29.2%	22.5%	62.4%	15.7%	8.1%	4.4%	0.2%
<b>Fibreglass &amp; Polyester</b>	12.1%	13.1%	8.1%	38.1%	24.9%	25.1%	14.3%	26.3%	16.0%	16.1%
<b>Polystyrene</b>	52.5%	64.6%	69.3%	32.7%	52.7%	12.4%	70.0%	65.6%	79.5%	83.7%
<b>TOTAL</b>	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%

Note: percentage weighted to allow for the regional building activity.

**Table 10. Average floor area comparison – survey responses and consent data.**

<b>Average floor area (square metres) for new housing</b>										
<b>Yearly Data 2009-2018</b>										
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Survey responses</b>	217.5	217.0	213.7	208.2	203.0	213.9	199.8	200.5	192.2	195.8
<b>Consent data (1)</b>	216.5	215.6	210.6	214.3	212.9	212.8	208.6	208.7	207.2	201.4

Note: survey average floor area weighted to allow for regional building activity  
 (1) Source: Statistics New Zealand