

Ian Rattray Build

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Plumbing:

The sanitary drainage and wastepipe systems shall be installed to satisfy compliance with all relevant performances, provisions and conditions of the **AS/NZS 3500.2:2003 Section 3.10 Drainage Design: Unvented Branch Drains**.

Please note the 65mm minimum below floor level pipe sizing requirements of Unvented Branch Drains.

Water Services shall comply with New Zealand Building Code Clause **G12/AS1 Water Services**.

The following requirements for the new hot water cylinder shall be met:

1. The hot water cylinder relief valves shall discharge to the adjacent gully trap in an approved manner positions. The pipe work shall not discharge into any galvanised steel tray or pipework.
2. The cylinders shall be installed to comply with the manufacturer's instructions and recommendations and the NZBC Clause G12 Water Supplies.
3. Provide permanent unrestricted visual and physical access to the cylinder, the control and relief valves, and to the tundish drain for the valves.
4. Seismic restraints are to be installed to the HWC, including tensioning brackets.

The delivery hot water temperature at any sanitary fixture used for personal hygiene shall be controlled not to exceed 45 degrees C. This shall be via an approved tempering valve.

Hot water pipework shall be thermally insulated to comply with the requirements of **Energy Efficiency H1/AS1 Clause 5.0 Hot Water Systems**.

Storm water downpipes and drainage shall comply with the New Zealand Building Code Clause **E1/AS1 Surface Water**.

Pipework materials:

All drains, wastes and vents in Upvc.

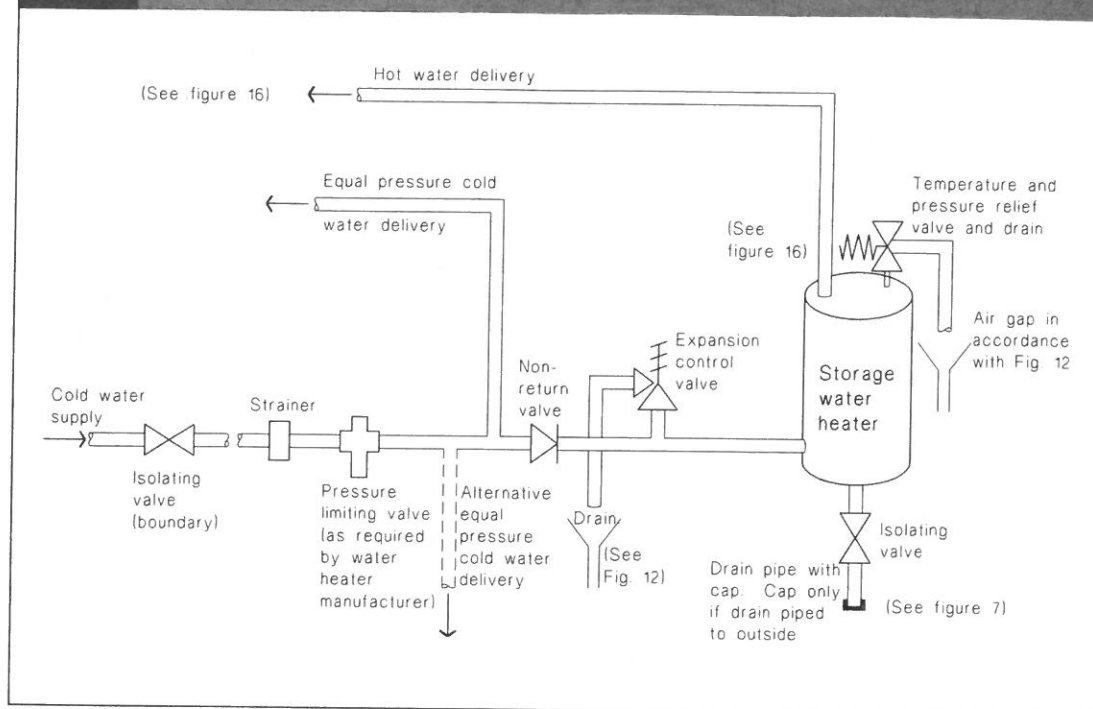
All hot and cold water services in polybutylene or copper. Cooper pipework shall be installed for hot water 1 meter to and from the hot water cylinder to comply with G1/AS1.

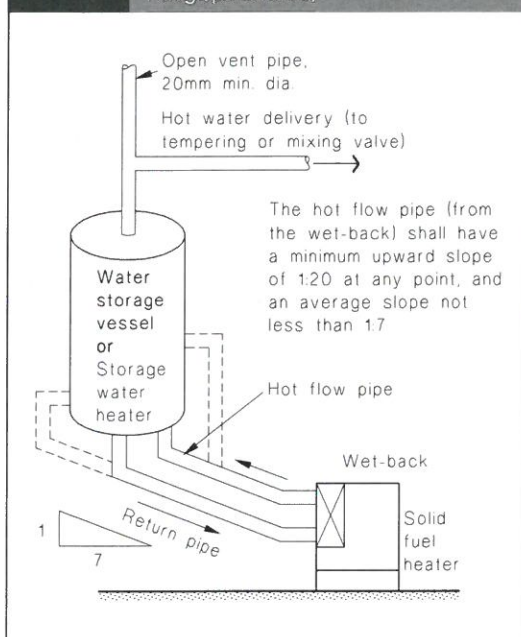
All storm water in Upvc.

Ventilation:

All spaces are naturally ventilated.

Figure 8: Mains Pressure Storage Water Heater System (unvented)
Paragraphs 6.1.2 and 6.2.1 b)



Amend 5
Feb 2004**Figure 15: Wet-back Installation – Open Vented System**
Paragraph 6.13.1 a)**6.14 Safe water temperatures****6.14.1 Maximum temperatures**

The delivered hot water temperature at any *sanitary fixture* used for personal hygiene shall not exceed:

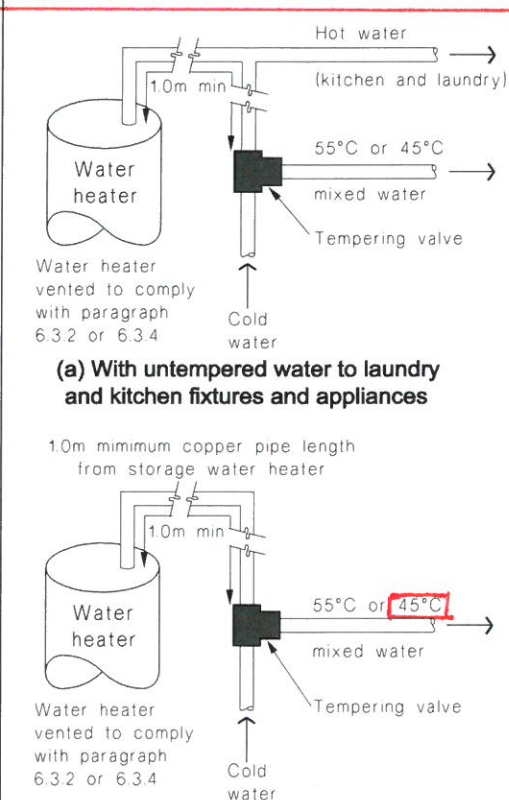
- 45°C for early childhood centres, schools, old people's homes, institutions for people with psychiatric or physical disabilities, hospitals, and
- 55°C for all other *buildings*.

COMMENT:

- At greatest risk from scalding are children, the elderly, and people with physical or intellectual disabilities, particularly those in institutional care.
- Sanitary fixtures** used for personal hygiene includes showers, baths, hand basins and bidets.

6.14.2 Hot water delivered from storage water heaters

- An acceptable method of limiting hot water temperature delivered from *storage water heaters* is to install a mixing device between the outlet of the *water heater* and the *sanitary fixture* (see Figure 16).

Amend 5
Feb 2004Amend 5
Feb 2004**Figure 16: Tempering Valve Installation**
Paragraph 6.14.2 a)**Note:**

- For optimum system efficiency the tempering valve, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the tempering valve.
- 1.0m minimum copper pipe length from storage water heater.

- Tempering valves shall comply with NZS 4617 or AS 1357.2.

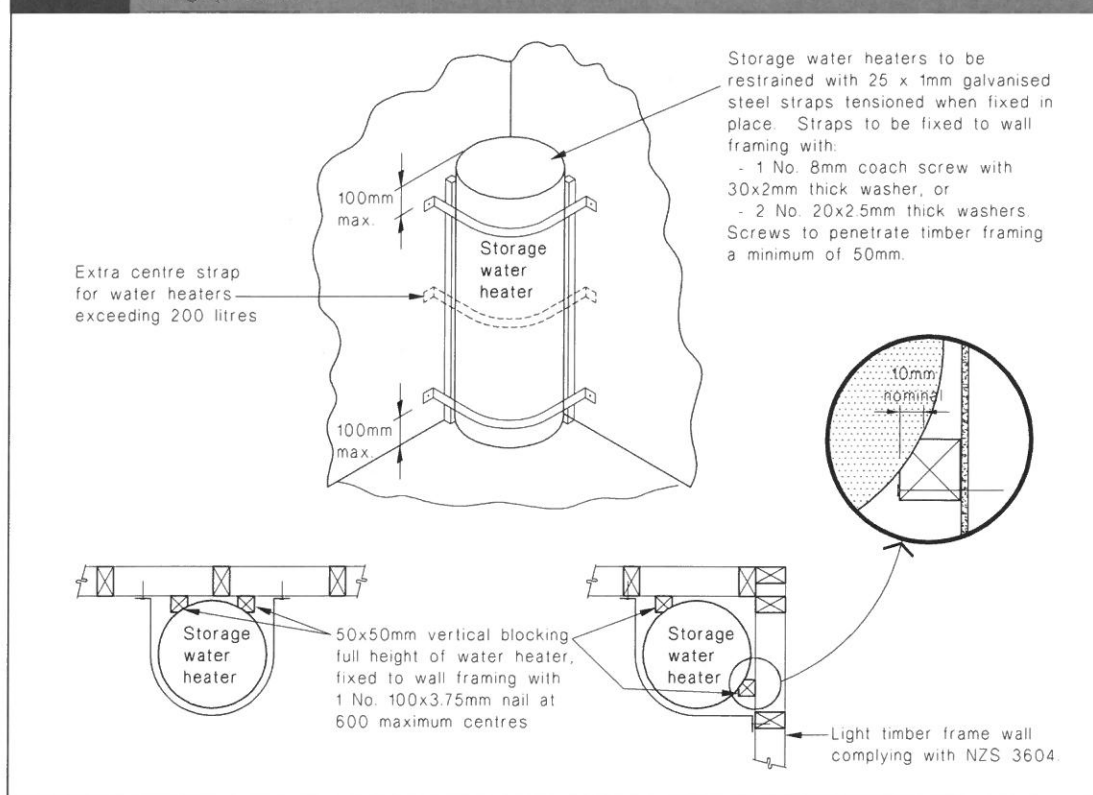
6.14.3 Legionella bacteria

Irrespective of whether a mixing device is installed, the *storage water heater* control thermostat shall be set at a temperature of not less than 60°C to prevent the growth of *Legionella* bacteria.

Third Edition
Dec 2007Amend 5
Feb 2004

Amend 5
Feb 2004

Figure 14: Seismic Restraint of Storage Water Heaters 90 – 360 litres
Paragraph 6.11.4



6.11.4 Structural Support

NZBC B1.3.2 requires *building elements* (including *storage water heaters*) to be adequately supported including support against earthquake forces. The method illustrated in Figure 14 is acceptable for *water heaters* up to 360 litre capacity. Where fittings and pipework are attached to the *water heater* through the supporting platform or floor a 50 mm minimum clearance shall be provided between the fitting and the support structure.

6.11.5 Another acceptable solution for securing *storage water heaters* against seismic forces is given in Section 203 of NZS 4603.

~~6.12 Hot water pipe sizes~~

6.12.1 The *diameter* of hot water supply pipes from *storage water heaters* and to *sanitary fixtures* shall be no less than those required by Table 4.

~~6.13 Wet-back water heaters~~

6.13.1 *Wet-back water heaters* shall be:

- Connected only to *open vented storage water heaters*, or a water storage vessel (see Figure 15), and
- Made of copper.

6.13.2 Copper pipework shall be used between the wet-back and the *water tank*.

Third Edition
Dec 2007Amend 5
Feb 2004Amend 5
Feb 2004

NZ PATENT
APPLICATION # 524865
CYLINDER RESTRAINT KIT

WALL

STEP 1:
Locate vertical Stud
or horizontal Nog **A**

STEP 2:
Fasten EQ Bracket **B** (Earthquake Bracket)
to Stud or Nog with Tek Screw **C**

STEP 3:
Measure the distance around the
Cylinder from wall to wall near
the base of both EQ Brackets

STEP 4:
Remove tape
Cut off the angled tab
Thread the Simplefix Strap back
through the Nylon Tie until the required
length is obtained then cut

WARNING: DO NOT CUT NYLON TIE

STEP 5:
Fit both ends of the
Simplefix Strap onto
the EQ Brackets with
3/16" Bolts & Nuts

STEP 6:
Fit Tensioning Device **F**
to the Simplefix Strap
as shown below.
Tighten until
firm

A Stud or Nog

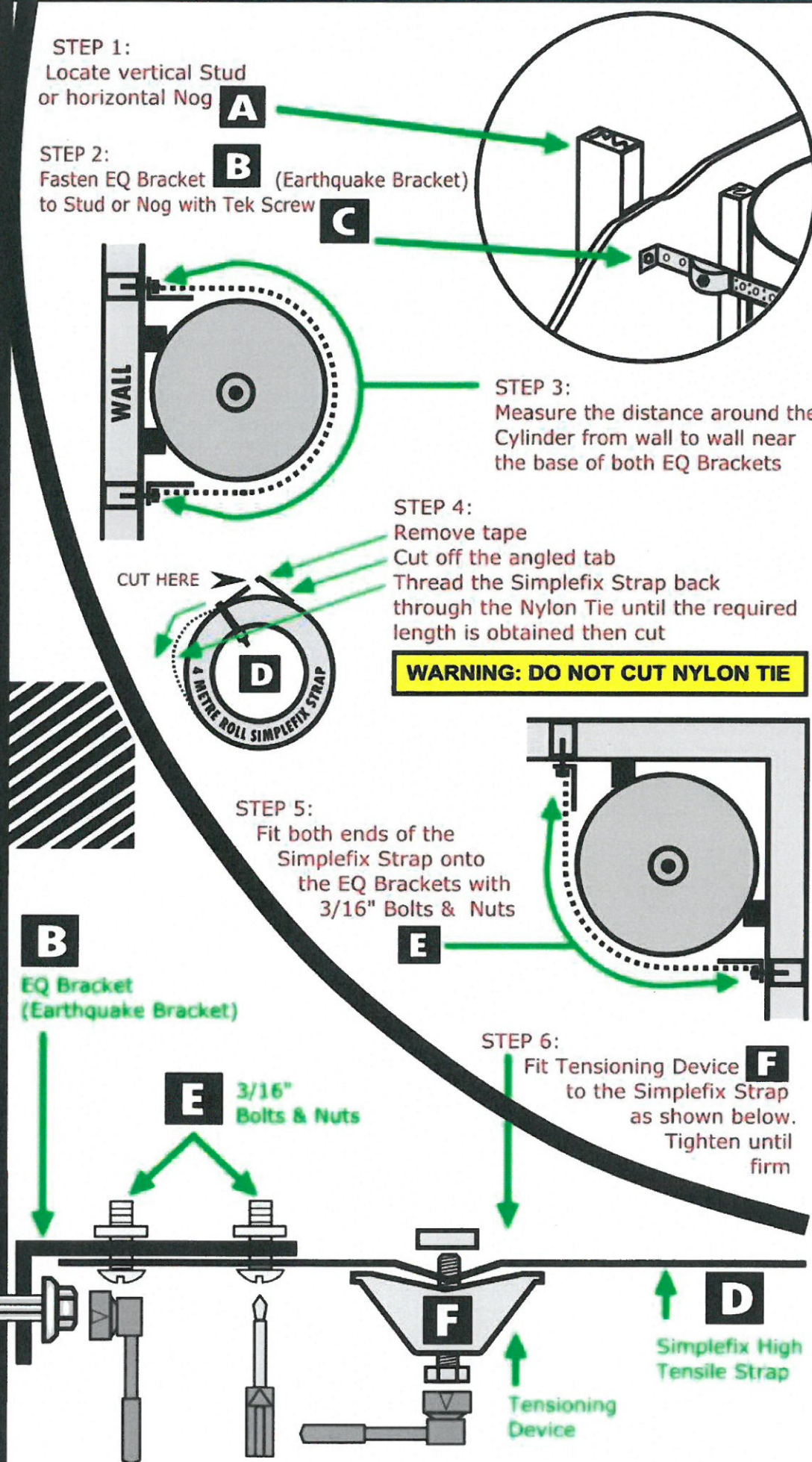
B EQ Bracket
(Earthquake Bracket)

C Tek Screw

E 3/16"
Bolts & Nuts

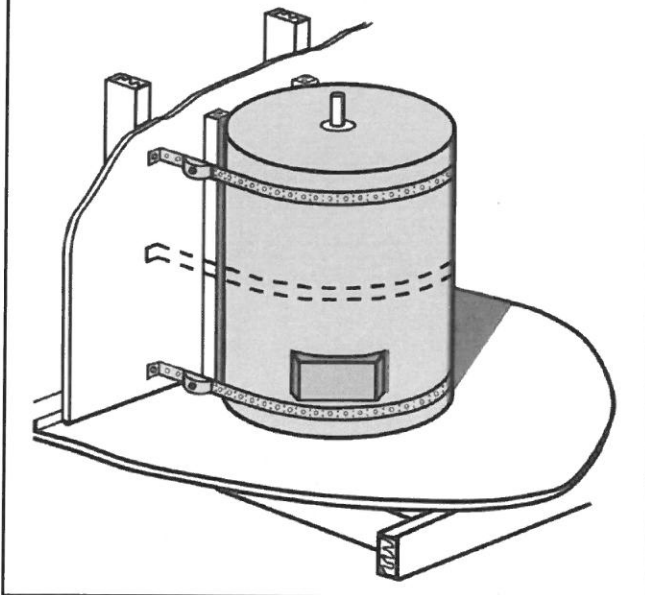
D Simplefix High
Tensile Strap

Tensioning
Device



New legislation for seismic restraining of storage water heaters

New legislation has called for an increase of around 50% more strength required to secure storage water heaters.



The "Simplefix" seismic restraint kit has been design checked by a Registered Engineer, for water heaters up to 700 litre capacity. The check was carried out in accordance with the seismic design Code NZS 1170.5:2004. **(Engineers statement available on request)**

Compliance is confirmed with Documents BI & B2 prepared by the Dept of Building and Housing to be in accordance with Section 22 of the Building Act 2004.

It is therefore recommended:

Cylinder up to 200 litre capacity 2 x Straps

Cylinder 200 to 360 litre capacity .. 3 x Straps

Cylinder 360 to 500 litre capacity .. 4 x Straps

Cylinder 500 to 600 litre capacity .. 5 x Straps

Cylinder 600 to 700 litre capacity .. 6 x Straps

NB 1: This design includes "Simplefix" 0.75mm x 25mm wide G550 high tensile Galv strap

NB 2: For full design strength use only brackets and components supplied as part of the Kit

NB 3: Additional strap required where installation occurs 12mtrs above ground level

Remember to ask for the "Simplefix" brand, it comes with full installation instructions!

Manufactured for and distributed by: Ray Staiger Limited, 26 Avalon Drive Hamilton. Ph: 07 847-6254



BRANZ Appraised

Appraisal No.761 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

BRANZ

APPRAISAL

No. 761 (2011)

Amended 31 January 2013

SIMPLEFIX WATER STORAGE CYLINDER RESTRAINT KITS

Distributed by:
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Hamilton

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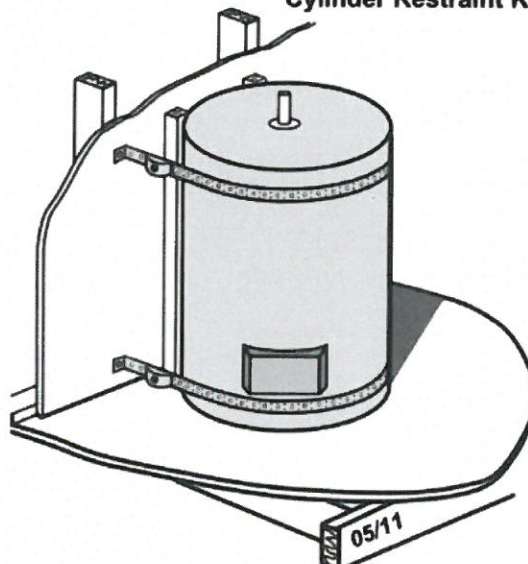


Product

1.1 The SimpleFix Cylinder Restraint Kit is for seismically restraining water storage cylinders.



Cylinder Restraint Kit



Ray Staiger Limited

www.simplefix.co.nz

Scope

2.1 The SimpleFix Cylinder Restraint Kit is used for seismically restraining water storage cylinders up to 700 litres.

2.2 The SimpleFix Cylinder Restraint Kit is for use with timber framed buildings and in dry interior environments.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the SimpleFix Cylinder Restraint Kit if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. The SimpleFix Cylinder Restraint Kit meets the requirements for loads arising from earthquake [i.e. B1.3.3 (f)].

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. The SimpleFix Cylinder Restraint Kit meets this requirement.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The SimpleFix Cylinder Restraint Kit meets this requirement and will not present a health hazard to people.

3.2 For water storage cylinders less than 360 litres capacity, this is an Appraisal of an **Acceptable Solution**, and for water storage cylinders greater than 360 litres capacity this is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 The SimpleFix Cylinder Restraint Kit components and accessories supplied by Ray Staiger Ltd are:

- Galvanised strap, 25 x 0.75 mm, G550.
- Galvanised earthquake brackets.
- Tensioning device.
- Type 17 screws, 55 mm long.
- 3/16" bolts and nuts for connecting the straps to the earthquake brackets.

Handling and Storage

5.1 The SimpleFix Cylinder Restraint Kits are reasonably robust, but must be kept dry before and after installation.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for SimpleFix Cylinder Restraint Kits. A copy of the installation instructions is included with each kit. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, installation, use and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 SimpleFix Cylinder Restraint Kits are for use in dry, internal environments.

7.2 For water storage cylinders up to 360 litres capacity the SimpleFix Cylinder Restraint Kits are an Acceptable Solution in accordance with NZBC Acceptable Solution G12/AS1 Paragraph 6.11.4. For cylinders over 360 litres capacity the SimpleFix Cylinder Restraint Kits are an Alternative Solution to the NZBC and at the design stage of the timber wall framing consideration should be given as to how earthquake loads will be transferred from the studs to the top and bottom plates.

7.3 Floor framing, flooring and platforms must be designed to support the water storage cylinder.

Structure

8.1 The number of straps required when using the SimpleFix Cylinder Restraint Kits depends on the size of the cylinder to be restrained and the height of the cylinder within the building. Table 1 below gives the number of straps to be used.

8.2 When the cylinder is to be installed more than 12 m above the ground an additional strap is required to the number given in Table 1.

Table 1: Cylinder Strap Requirements

Cylinder Size	Number of Straps Required
Up to 200 litre capacity	2
201 litre up to 360 litre capacity	3
361 litre up to 500 litre capacity	4
501 litre up to 600 litre capacity	5
601 litre up to 700 litre capacity	6

Durability

Serviceable Life

9.1 The components of SimpleFix Cylinder Restraint Kits are all steel. As long as they are kept dry in service they are expected to have the same serviceable life as the cylinders that they restrain.

Maintenance

10.1 The SimpleFix Cylinder Restraint Kits will require little maintenance as long as they are kept dry. Any damaged straps or fixings must be replaced.

Installation Information

11.1 Timber vertical blocking as described in NZBC Acceptable Solution G12/AS1 Paragraph 6.11.4 and Figure 14 must be installed. This incorporates 50 x 50 mm vertical timber blocking for the full height of the cylinder fixed at maximum 600 mm centres with 100 x 3.75 mm nails.

11.2 SimpleFix Cylinder Restraint Kits are installed in accordance with the Technical Literature. The earthquake brackets are screwed to the framing using the supplied screws. A suitable length of strap is then cut from the supplied reel. This is fixed to the earthquake brackets with the 3/16" bolts. The tensioner is then used to take up the slack in the strap.

11.3 The top strap must be no more than 100 mm from the top of the cylinder and the bottom strap no more than 100 mm from the bottom of the cylinder. If more than two straps are used these should be evenly distributed up the height of the cylinder.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

12.1 Tensile tests were carried out by Opus Laboratories, Hamilton to determine the strength of the system. These have been reviewed and found to be satisfactory.

Investigations

13.1 Structural calculations have been carried out by Opus International Consultants. These have been reviewed by BRANZ and found to be satisfactory.

Quality

14.1 Details of the quality and composition of the materials used were obtained by BANZ and found to be satisfactory.

14.2 Ray Staiger Limited is responsible for the quality of the product supplied.

14.3 The quality of installation, in accordance with the instructions of Ray Staiger Limited, is the responsibility of the installer.

Sources of Information

- New Zealand Building Code Handbook Department of Building and Housing, Third Edition September 2010.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, **SimpleFix Cylinder Restraint Kids** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Ray Staiger Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Ray Staiger Limited:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Ray Staiger Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Ray Staiger Limited** or any third party.

For BRANZ

P Burghout
Chief Executive

HOT WATER SUPPLY

1. General.

Mains pressure hot water shall be supplied to the mains pressure hot water cylinder as indicated in drawings. Water heaters, pipe work and valving shall be as specified below and installed in accordance with NZBC G12/AS1 or AS/NZS 3500.4:2003.

2. Hot Water Cylinder.

Provide and install the specified hot water cylinder pre-wired with element, thermostat and energy cut-off device.

3. Temperature Requirements

The hot water cylinder shall be set at a minimum temperature of 65°C. Temperature gauges shall be installed on the HWC. Personal hygiene fixtures (i.e. wash hand basins, showers & sinks) shall have their temperature controlled to 45°C with group tempering valves positioned at the HWC, as indicated in drawings.

4. HWC Valve Set.

The 25mm valve set to the HWC shall include isolating valve, non-return valve, 500kPa pressure limiting valve, 700kPa expansion control valve, drain valve and maintenance isolating valves.

5. Isolation Valves

The isolation valves as noted on the drawing shall be sized in the correct diameter according to the pipe size and shall be of the ball valve kind. An additional isolation valve shall be positioned immediately prior to the water heater to enable the valve train to be removed without draining the water heater.

6. Tempering Valves.

45°C tempered hot water supplies are required to all personal hygiene fixtures. This will be achieved using separate RMC TVA75HF 20mm tempering valves. The flow rate of the fixtures fed by each tempering valves shall not exceed the flow rate of the valves. The tempering valves shall be independently supported and tested on their maximum temperature.

7. Expansion Control Valve.

A matched 700 kPa 15mm cold water expansion control valve (ECV) shall be installed on all valve vented water heaters in accordance with the manufactures installation instructions. A 15mm copper or fusiotherm drain shall extend downwards to discharge above the PVC safe tray waste or other

safe location as indicated in the drawings.

8. Seismic Restraint

Secure HWC to wall with two earthquake resisting galvanised steel straps in accordance with G12/AS1.

9. Safe Tray

All hot water cylinders shall be installed on a safe tray of compatible material, which shall drain to the combined TPR discharge waste.

10. Hot Water Pipework.

The hot water supply pipework shall be copper or fusiotherm and shall be concealed unless specifically denoted otherwise on the drawings. Pipe work shall rise and fall to fixtures within the wall cavities or ducts. Pipework shall not be surface mounted.

11. Pipework Insulation

All hot water pipework from the cylinder to the fixtures and at the cylinder shall be insulated with Rockwool or similar with a minimum thickness of 25mm. All joints and cut tube shall be taped and closed up without gaps.

12. Testing

Water supply services shall be completed in a manner to allow testing sections. All new water supply pipework is to be tested to a pressure of 1500 kPa for 30 minutes or as specified by the PPR manufacture prior the the enclosure of the work. All testing procedures shall be documented and made available on request to the territorial authorities, or project manager. All detected defects, leaks, water hammer etc. shall be remedied prior to proceeding. All pressure tests shall be witnessed by the project manager.



316581D-10
JULY 2010

INSTALLATION INSTRUCTIONS & OWNERS GUIDE

RHEEM MAINS PRESSURE ELECTRIC HOT WATER HEATERS

Congratulations for choosing a Rheem Water Heater

It is important that you take a few minutes
to read this booklet as it may save you
time and trouble later.

If you require any further information or your
water heater needs to be serviced, please contact the
Rheem Service Department on 0800 657 335,
or the nearest service centre
(look in the Yellow Pages under Plumbers)

Important to the Installer

Do not leave this booklet inside the element cover
after installation

Please leave the booklet with the water heater's owner

IMPORTANT INFORMATION

GENERAL

- The information contained in this manual, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the "Consumer Guarantees Act 1993", Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.
- This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not play with the water heater.

ABOUT YOUR WATER HEATER

Q. DOES THE WATER QUALITY AFFECT THE WATER HEATER?

- A. Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. **If you are in a known harsh water area please read page 7.**

Q. HOW HOT SHOULD THE WATER BE?

- A. The Optima features a user adjustable thermostat (temperature range of 60 – 75°C), which allows you to choose the most suitable temperature for your hot water needs.
- The Rheemglas models (temperature range 60 - 70°C) require an authorised person to make any temperature adjustments.
- For reasons of safety and economy, we advise the thermostat is adjusted to the lowest setting that meets your needs.

The New Zealand Building Code requires a temperature setting of not less than 60°C.

Q. HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

- A. Refer to the installation requirements on page 4.

Q. HOW LONG WILL THE WATER HEATER LAST?

- A. There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 8).

The life of the water heater may be extended by arranging for an authorised person to inspect the anode and replace it, if required.

The suggested time after installation when the anode should be inspected is:

Rheemglas	8 years
Optima	10 years

For softened water supplies or in areas of poor water quality, it is recommended the anode be inspected 3 years earlier than shown (refer to "Water Quality" on page 7).

HOW THE WATER HEATER WORKS

SINGLE AND TWIN ELEMENT MODELS

Water stored within the water heater is heated by the electric heating element. The thermostat controls the electricity supply to the heating element so that a constant water temperature is maintained. As the cold water is heated it expands approximately 1/50 of its volume and, as a result, a small amount of water is discharged from the cold water expansion valve.

NON-SIMULTANEOUS ELEMENT MODELS

The two heating elements are wired for non-simultaneous operation, so that only one heating unit can operate at a time. The bottom heating unit is usually connected to an off-peak (overnight) supply and the top heating unit to a continuous supply. The red link wire must be removed from the terminal block during installation if two separate power supplies are to be used. Leaving the link in place ensures both elements operate correctly with a single power supply.

The basic operation is as follows: when the water temperature at the top of the water heater has reached the set temperature, the thermostat switches the top element off. This creates a circuit to the bottom heating element by switching the neutral.

SAFETY

On all models, a Temperature and Pressure Relief valve is supplied with each water heater. It can be found inside the front cover and must be mounted on top of the water heater.

Also fitted to the water heater is a thermostat, which incorporates an over-temperature thermal cut-out device.

WARNING: The operation of the thermal cut-out indicates a possible dangerous situation. Do not reset the thermal cut-out until the water heater has been serviced by an authorised service person.

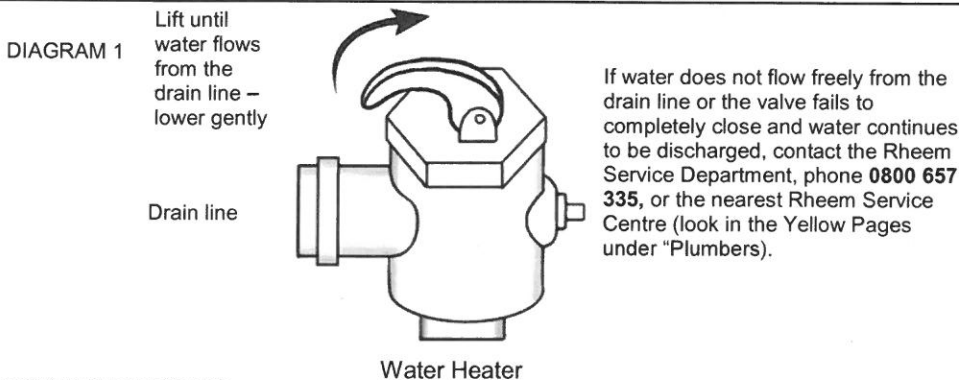
These safety devices must not be tampered with, or removed, and under no circumstances operate the water heater unless both devices are fitted.

REGULAR CARE

MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF VALVE:

Valve manufacturers recommend that you operate the easing lever (see diagram. 1) on the Temperature and Pressure Relief valve once every six months. It is **very important** that you **raise and lower the lever gently**.

WARNING: To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to do this may result in the water heater bursting.



GOING ON HOLIDAYS:

If you plan to be away from home for one or two nights, we suggest that you leave the water heater switched on. However, if you plan to stay away more than a few nights, conserve energy by switching the water heater off at the isolating switch, or at the main switchboard. In locations where freezing could occur, you should leave the water heater turned on.

SAVE A SERVICE CALL

CHECK THE ITEMS BELOW BEFORE MAKING A SERVICE CALL. YOU MAY BE CHARGED FOR SERVICE IF THE FAULT IS NOT RELATED TO THE WATER HEATER MANUFACTURE OR PARTS SUPPLIED WITH THE WATER HEATER BY RHEEM.

WATER DISCHARGING FROM EXPANSION CONTROL VALVES

It is normal for the cold water expansion valve and the temperature and pressure relief valve to discharge a small quantity of water during the heating cycle. If either of these valves discharge more than a bucket full of water in 24 hours, one of the following may be the cause.

- **Continuous dribble**
Try gently raising the easing lever on the relief valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.
- **Heavy flow of hot water until the water is cold – then stops while the water reheats**

Immediately turn off the electricity supply to the water heater. Call the Rheem Service Department or look in the Yellow Pages under "Plumbers" for your nearest Rheem Service Centre to arrange an inspection.

▪ **A steady flow of water (often at night)**

This may indicate that your cold water pressure sometimes rises above the design pressure of the water heater. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

NOT ENOUGH HOT WATER (or no hot water)

▪ **Is the electricity turned on?**

Check the switch marked 'water heater' at the switchboard and the water heater isolating switch. Check the fuse marked 'water heater'.

WHERE THE WATER HEATER IS CONNECTED TO AN OFF PEAK (NIGHT RATE) ELECTRICAL TARIFF, THE SUPPLY MAY NOT BE AVAILABLE AT CERTAIN TIMES OF THE DAY.

▪ **Do you have the correct size heater for your requirements?**

Refer to the sizing guide in the Rheem sales literature or the Rheem website.

▪ **Is one outlet (especially the shower) using more hot water than you think?**

Carefully review the family's hot water usage and if necessary, check the shower flow rate. For maximum efficiency we recommend the flow rate through the shower is between 8 to 10 litres per minute. This can be achieved by installing a flow control valve if provision is not made to fit a flow restrictor in the shower rose.

▪ **Ensure the thermostat setting is appropriate.**

HIGH ELECTRICITY BILLS

▪ **Is one outlet (especially the shower) using more hot water than you think?**

▪ **Is there a leaking hot water pipe, dripping hot water tap, etc?**

Even a small leak will waste a surprisingly large quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe-work.

▪ **Is either of the expansion valves discharging too much water?**

▪ **Consider recent changes to your hot water usage pattern and check if there has been an increase in tariffs since your previous account.**

INSTALLATION

Please take careful notice of the advice given as Rheem New Zealand Limited will not be liable for any loss or damage suffered as a result of the incorrect installation of the water heater, or any failure to check the capability of the electrical supply, wiring to the water heater.

The water heater must be installed by an authorised service person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 electrical installations and all local codes and regulatory authority requirements.

▪ **WATER HEATER LOCATION**

Water heaters with a galvanised outer casing are only suitable for indoor installations, whereas water heaters with a painted casing are suitable for both indoor and outdoor installations. Clearance must be allowed for servicing and removal of the water heater and it must be accessible without the use of a ladder or scaffold. (Typical clearances are: TPR valve removal 135 mm, Element Cover and Element Removal 400 mm). Also, you must be able to read the information on the rating plate and if possible, leave headroom of one water heater length so the anode can be inspected or replaced.

▪ **CONNECTION SIZES**

- Hot water connection: RP ¾/20.
- Cold water connection: RP ¾/20.
- Relief valve connection: RP ½/15.

▪ **INLET/OUTLET CONNECTIONS**

A union must always be provided at the cold water inlet and hot water outlet for disconnection reasons. Both connections are fitted with plastic liners and it is important that they remain in situ for the water heater to function properly. These liners will be pushed into the correct position as the fitting is being screwed in.

- **NON RETURN VALVE**

A non return valve must be installed on the cold water line to the water heater.

- **PIPE SIZES**

The cold water line to the water heater should be the same size or bigger than the hot water line from the water heater. For best results, choose the most suitable pipe size for each individual application.

- **COLD WATER EXPANSION VALVE**

A cold water expansion valve must be fitted to the cold water line to the water heater.

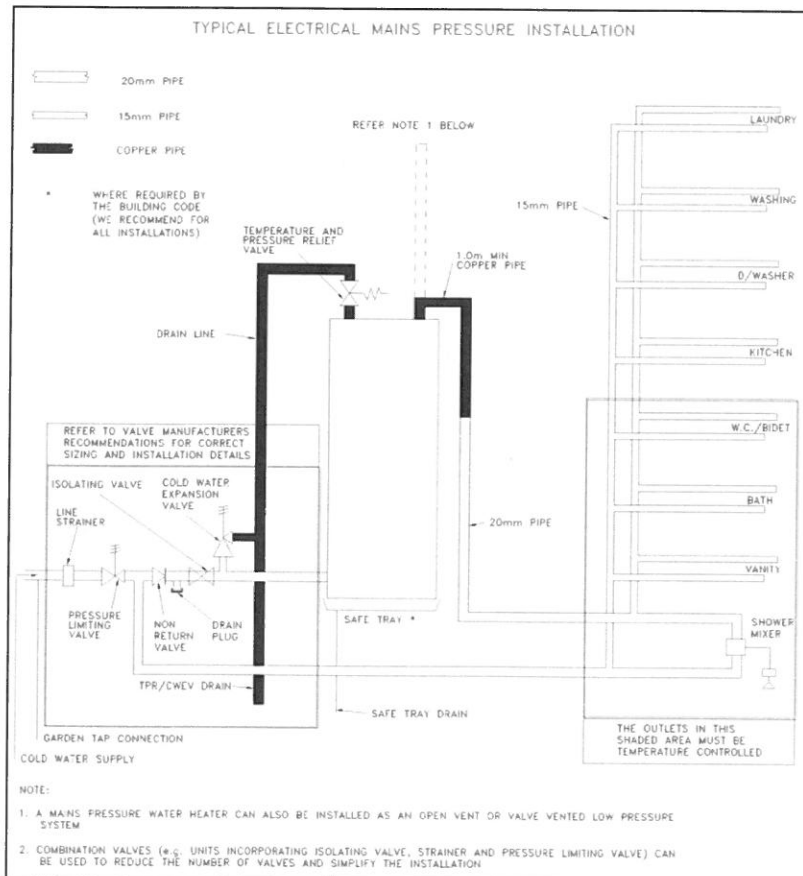
- **TEMPERATURE AND PRESSURE RELIEF VALVE**

When fitting the temperature and pressure relief valve, ensure the probe has not been bent. Seal the thread with PTFE tape, or similar, as recommended by the valve manufacturer and screw the valve into the off-centre socket. Do not use a wrench on the valve body – use the spanner flats provided. Drain the TPR valve with a pipe the same size as the valve outlet. The drain must run downwards to a visible point outside the house, preferably over a gully trap.

In locations where the pipe exceeds 3 metres unbroken length, or freezing could occur, an air break must be provided within 300 mm of the TPR valve.

WARNING: The drain line from the TPR valve must be in copper. A Rheem mains pressure water heater must **not** be installed and operated without a suitable (valve that complies with AS 1357.1) temperature and pressure relief valve. Under no circumstances block the outlet of this valve or its drain pipe.

DIAGRAM 2:



- **PRESSURE LIMITING/REDUCING VALVE**

If the water supply pressure exceeds the rated pressure, a pressure limiting or reducing valve is to be fitted in the installation.

The water heater must be installed with a properly drained safe tray where there is the possibility of water damage to furniture, carpets or building. All water heaters must be restrained to protect against seismic forces. (Refer to the Zealand Building Code for acceptable solutions.)

CONNECTIONS - ELECTRICAL

The electrical installation must be completed in accordance with AS/NZS 3000. All water heaters are designed for 230 VAC, 50 Hz mains operation and a means of disconnection from the power supply must be incorporated in the fixed wiring during installation.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm plain to screw adaptor. Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. For details, refer to the wiring diagram on the inside of the element cover. **A separate heating element earth wire is not required because the element earths by the thread of the element boss or the flange being in contact with the element socket.**

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory Megger reading is obtained.

- Open all of the hot water taps in the house (don't forget the shower). Open the cold water isolation valve fully to the water heater to force the air out of the taps. As water flows freely from each tap, close it. Check the pipe-work for leaks.
- Switch on the electrical supply at the isolating switch to the water heater.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the isolating switch to the water heater.
- Close the cold water isolation valve at the inlet to the water heater.

DRAINING THE WATER HEATER

- Switch off the electrical supply at the isolation switch to the water heater.
- Close the cold water isolation valve.
- Operate the relief valve easing lever to release the pressure in the water heater.
- Drain the water heater through the drain valve or plug.
- Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain.

WHAT YOU SHOULD KNOW ABOUT WATER QUALITY

Your Rheem water heater is manufactured to suit the water condition of most local authority water supplies. However, some water supplies can have a detrimental effect on the water heater and its operation and/or life expectancy. If you are unsure of your water quality, you can obtain information from your local water supply authority.

HARSH WATER AREAS

Rheem water heaters are designed for use in areas where the Total Dissolved Solids (TDS) content of the water supply is less than 2500 mg/L.

In areas where the TDS exceeds 600 mg/L it is possible the standard magnesium anode fitted to the water heater, may be excessively active. To alleviate this, the magnesium anode should be replaced with an aluminium anode. Where the TDS of the water is less than 40 mg/L, such as when the water has been deionised or is from an alpine supply, a high potential anode should be used. The changing of anodes must be carried out by a plumber or qualified service person.

CAUTION

If your water supply has a TDS greater than 600 mg/L and the anode has not been changed, there is a possibility of hydrogen gas accumulating in the top of the water heater during long periods of no use.

If, under these conditions, the water heater has not been used for two or more weeks the following procedure should be carried out before using any electrical appliances (e.g. automatic washing machines and dishwashers) which are connected to the hot water supply.

The hydrogen, which is highly flammable, should be vented safely by opening a hot tap and allowing the water to flow. There should be no smoking or naked flames near the tap whilst it is turned on. Any hydrogen gas will be dissipated as indicated by an unusual spurting of the water from the tap. Once the water runs freely again any hydrogen in the system will have been released.

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. When scaling water has a saturation index greater than +0.40 an expansion control valve must be fitted on the cold water line after the non-return valve.

Where the saturation index exceeds +0.80, low watts density elements should be used. Where the saturation index is less than -1.0, a corrosive resistant heating unit should be used (contact your local Rheem Service Department or an authorised service person).

WATER HEATERS NOT INSTALLED IN ACCORDANCE WITH THE ABOVE ADVICE WILL NOT BE COVERED BY THE RHEEM WARRANTY.

WARRANTY

In addition to your legal rights, Rheem New Zealand Limited makes the following promise to the owner. We will repair or, if necessary, replace a defective domestic water heater or part, which has failed due to faulty manufacture on the following terms and conditions:

Component	Installation	Model	Warranty Period (since installation)	Warranty
All Components Except Inner Cylinder	All Installations	All Models	First 12 Months	New component or water heater (at Rheem's sole discretion) free of charge, including labour
		Optima	First 3 years	New component or water heater (at Rheem's sole discretion) free of charge, including labour
Inner Cylinder	Water heater installed in a single-family domestic dwelling with a thermostat setting below 76°C	Rheemglas & Calorifier	First 3 years	New water heater free of charge, including labour
			Years 4 & 5	New water heater free of charge, with installation and labour costs the responsibility of the owner
		Optima	First 5 years	New water heater free of charge, including labour
			Years 6 – 10	New water heater free of charge, with installation and labour costs the responsibility of the owner
	Water heater installed in any other than a single family domestic dwelling with a thermostat setting below 76°C	Rheemglas & Calorifier	First 12 months	New water heater free of charge, including labour
			Years 2 & 3	New water heater free of charge, with installation and labour costs the responsibility of the owner
		Optima	First 12 months	New water heater free of charge, including labour
			Years 2 – 5	New water heater free of charge, with installation and labour costs the responsibility of the owner

DURABILITY

Your Rheem water heater meets the durability requirements of New Zealand Building Code provided the water heater is:

1. Installed in accordance with the New Zealand Building Code and the Rheem Installation Instructions.
2. Maintained in accordance with these instructions.
3. Not damaged in any way.
4. Stored correctly prior to use, and
5. Your water quality remains within the requirements stated in the Installation Instructions.

WARRANTY CONDITIONS

1. The water heater must be installed and maintained in accordance with the Rheem Installation Guides supplied with the water heater, and comply fully with all the requirements of the New Zealand Building Code.
2. The warranty applies to the faulty manufacture of the water heater only and does not cover any plumbing, gas fitting or electrical parts supplied by the installer, that are not an integral part of the water heater, e.g. pipe-work, pressure limiting valve, stop valves, non-return valves, electrical switches, pumps and fuses.

WARRANTY INFORMATION

WARRANTY EXCLUSIONS:

The Rheem Warranty does not cover repair or replacement work to the water heater or its components caused directly or indirectly by:

1. Accidental damage
 2. Acts of God
 3. Failure due to misuse
 4. Incorrect installation
 5. Attempts to repair the water heater, other than by a Rheem Authorised Service Centre, or the Rheem Service Department
 6. Excessive water pressure, negative pressure or excessive heat input
 7. Non compliance with a) the Rheem Installation Instructions, b) relevant statutory regulations, c) New Zealand Building Code requirements.
- This warranty does not include any additional costs, for removing a heater where dismantling or removal of other materials is required, that is, walls, doors or roofs. Rheem New Zealand Limited will not pay claims for damage to furniture, carpets, walls, foundations or any other consequential loss either directly or indirectly due to leakage or other causes from a water heater.

Repairs to the water heater due to chemical/scale formation in waterways when the heater has been connected to a harmful water supply as outlined on page 7 of the owners manual.

Service under this warranty can be provided by a **RHEEM AUTHORISED SERVICE CENTRE**.

Such services will be provided during their normal business hours.

Additional mileage and cartage charges shall be made for any water heater installed in a location exceeding 25km from the nearest Rheem Service Centre.

Note: You may have other rights in addition to this warranty under the "Consumer Guarantees Act 1993".

RHEEM SERVICE DEPARTMENT, 475 Rosebank Road Avondale, Auckland Phone: 0800 657 335, Fax: 09 829 0222

Or consult the Yellow Pages under "Plumbers" for your nearest Rheem Authorised Service Centre



HOT WATER CYLINDER RESTRAINTS

The recent earthquakes in Canterbury have highlighted the need to secure items that may be critical to occupants' survival after an earthquake. One such item is the hot water cylinder.

By Graeme Beattie, BRNZ Principal Engineer

Hot water cylinders are a very valuable source of freshwater when the town supply is cut off, as happened after the earthquake in some parts of Christchurch for several weeks.

The hot water cylinder represents a large inertial mass – a 135 litre cylinder weighs approximately 170 kg when full. Without restraint, these can be flung around by the force of the earthquake and damage other items, or the pipe connections can be fractured (see Figure 1).

Block base and restrain top

Timber blocking may be installed to prevent sliding of the base of the cylinder on its supporting structure (see Figure 2). A minimum of three blocks should be used, spaced as evenly as possible around the perimeter. Each block needs to be fixed down with two Type 17 screws 75 mm long and not less than 12 g or two 100 mm long nails. However, this is only half of the answer.

The hot water cylinder is also liable to topple if it is not restrained at or near the top. Very often, there is only a single wall to which the restraint can be attached. The simplest solution is to install a metal strap commonly available from a builders' merchant (see Figures 2 and 3).



Figure 1: Damage to wall linings from unrestrained hot water cylinder.

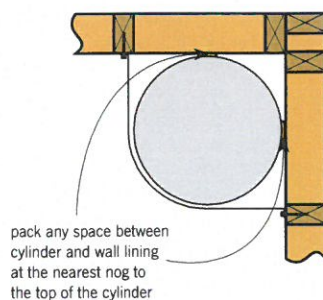
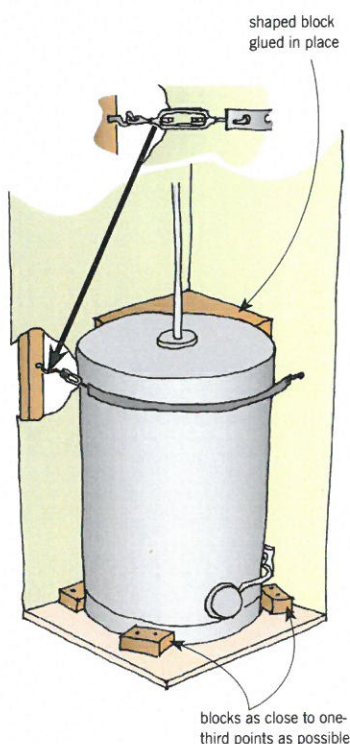


Figure 2: Recommended restraints for hot water cylinder in corner.

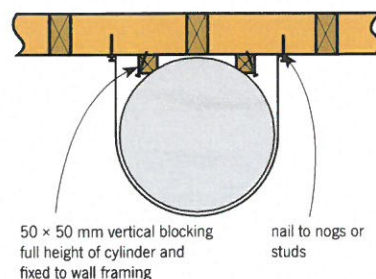
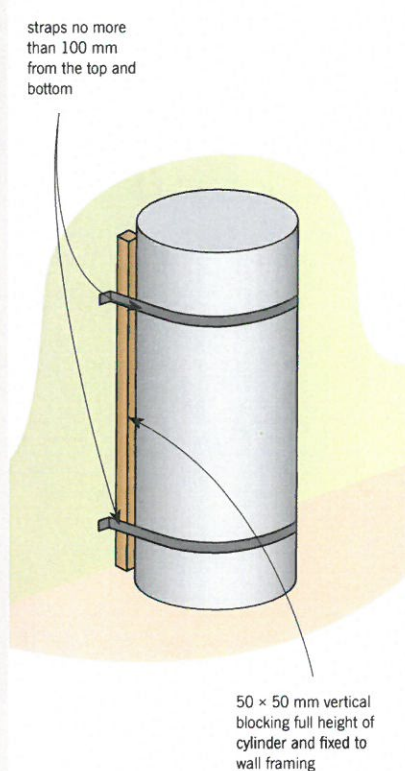


Figure 3: Hot water cylinder restraints on a flat wall (alternative to base blocks and strap at top).

It is important to have a solid substrate to which the restraint strap is attached, and studs or nogs should be located before fixing the strap.

Blocking needed at top as well

Wrapping the strap around the cylinder and fixing it to the wall on each side is *not* an adequate solution because the cylinder can still rock parallel to the wall during an earthquake.

It is important to fit timber blocking in conjunction with the metal strap (see Figures 2 and 3). This will allow the cylinder to be snugly restrained. As with the base restraint, adequate fixing strength is important to ensure satisfactory performance in an earthquake. Type 17 screws at least 50 mm long are recommended with a 30 × 2 mm square washer to sandwich the strap. Alternatively, a heavy duty hook may be fitted to the stud or nog and a

turnbuckle included in the strap for tensioning. A similar system may be installed near the base of the cylinder if there is no opportunity to fit the timber blocks on the supporting structure beneath.

Similar system for cylinders in corners

Where the cylinder can be restrained in a corner between two walls, a similar restraint system may be used. Again, it is important to pack the space between the cylinder and the walls to ensure that it is firmly sandwiched between the strap and the walls.

Retrofit possible

The restraint systems described can be installed on existing hot water cylinders, but it is simpler to have the restraint fitted during installation.

This allows good access to the back of the hot water cylinder to fit packing.

Curved timber packing blocks ensure an even bearing on the cylinder outer casing for restraint.

Heat pump water heaters

Heat pump water heaters are now becoming more common. These usually stand outside the house against the wall with rigid plumbing to the house.

Appropriate packing and blocking can be fitted in place before heat pumps are installed. This will ensure a satisfactory seismic restraint from the outset.

The method is essentially the same as for hot water cylinders, with the aim of preventing movement away from the wall or along the wall, so that the plumbing connections remain sound during an earthquake. ■