YOUR HOME
OUR PLANET

Everything you will want to know before building an Energy Efficient / Passive House

www.energyefficienthomes.co.nz

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Why we have written this E-Book

Congratulations on downloading our E-Book!

Whether you're already planning to build or simply exploring the idea of an energy-efficient home, we believe this guide will be invaluable. Our primary goal in creating this book was to empower you with knowledge, helping you make an informed choice when building your dream home.

Throughout these pages, we have strived to present information with impartiality, providing you with factual insights to guide your decision-making process effectively. One critical aspect that often goes unnoticed is the forthcoming building code changes and their profound impact on your investment.

In 2015, New Zealand, alongside 195 other participants, committed to the Paris Agreement. With the long-term aim of limiting global warming to below 2°C, preferably 1.5°C, compared to pre-industrial levels, the government's Ministry of Business, Innovation, and Employment (MBIE) is enforcing a series of code changes. By 2035, these changes aim to reduce the energy use of buildings significantly, from what started before the recent first change of 120kw per m2 to an impressive 15kw per m2. The transition will be a step by step process in the hope the building industry can # adapt to these new standards.

Improving the energy efficiency of buildings

Builders and architects across New Zealand will need to train and stay informed of the changes. They will need to proactively embrace the code changes to remain at the forefront of sustainable construction.

Building to a higher standard not only benefits the environment but also offers long-term financial advantages to you, the home purchaser. While it may require a slightly higher upfront investment, the cost savings will mean it will pay for itself compared to a house built to today's minimum code. When you put together the purchase cost, running cost, comfort and health benefits. You will see what many people have found. It just makes financial sense. The other big difference will be in the resale cost. As the code changes take effect and more and more people realize the benefits it will become difficult to sell a house built to the current building code.

We at Energy Efficient Homes Ltd sincerely hope this E-Book helps you wherever you are in the country.

If you find the information useful you may want to follow us on Facebook or Instagram and look for us on YouTube. You will see lots of other invaluable free information in our Newsletters and on these platforms.

New Zealand Building Code

In New Zealand, homes are typically constructed to meet the NZS 3604 standards, which represent the minimum requirements for new builds. But building to these minimum standards is falling short of what we need in our homes. When building you should consider moving beyond the standard code and opting for an Energy Efficient or Passive Home.

Building an Energy Efficient or Passive Home means going above and beyond the minimum requirements, ensuring that you future-proof your asset. By making this choice, you invest in a home that not only meets today's standards but also anticipates the future requirements of energy efficiency and sustainability.

Much like how we think of older, outdated houses now that are built to previous, lower standards; these changes are expected to lead to the devaluation of existing builds that fail to meet the new standard criteria. A house built to code today will fall below the required standard in the near future.

Passive homes

Passive homes represent the pinnacle of high-performance homes. To gain certification, they must meet a strict set of criteria, taking into account everything from site location to the products and construction methods used. At Energy Efficient Homes Ltd, our team of designers meticulously calculate every aspect of your passive build using proven mathematical models and physical principles. This meticulous planning gives you the confidence that your passive home will perform to an exceptionally high standard before the actual construction begins.

The foundation of our passive home design is built on the 5 Passive House Principles. Each of these principles is tailored to suit the specific location of your build, ensuring optimal energy performance and comfort, year-round and for many years to come. Passive homes' stringent certification processes and specific material requirements mean that they really do represent the most thermally efficient homes that money can buy.

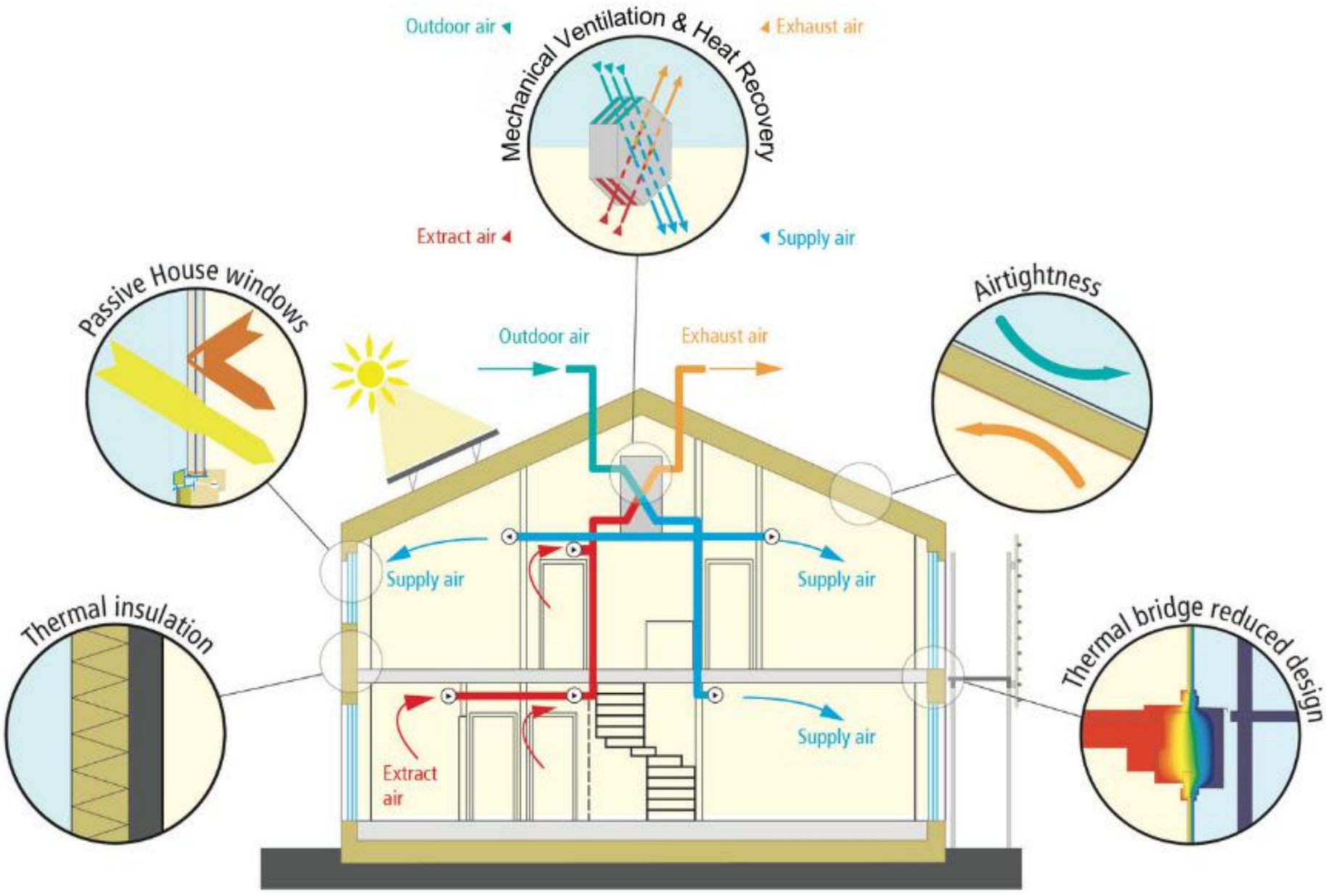
Energy Efficient Homes

Between the minimums of the NZ building code (NZBC) and the stringent criteria of Passive house sits Energy Efficient/High performance building. Building homes that are not only Energy Efficient but also cost efficient, we work with each client on an individual basis to design homes that suit their lifestyle and their budget.

By taking a strategic approach to the design and build process through a series of step by step improvements based on the passive house principles we create the most efficient home for the clients budget. When planning the order of improvements focus is placed on the greatest return on investment in terms of thermal efficiency and liveability.

The changes being made to the NZBC show that the bare minimum is no longer good enough. This book outlines some of the steps we take and products that we use to create healthy homes that people can afford. By choosing Energy Efficient Homes Ltd, you make a conscious decision to invest in your future, ensuring that your home not only benefits you but also contributes to the well-being of our planet. Together, let's build a sustainable future for all.

What are the Passive House Principles?



Registered Master Builders

CERTIFIED PASSIVE HOUSE TRADESPERSON

TRADESPERSON

DESIGNER

CERTIFIED PASSIVE HOUSE DESIGNER

Quality Insulation

The Benefits

When considering an Energy Efficient build, one of the primary upgrades to focus on is the level of insulation within your home. Insulation not only keeps your home warm during winter but also helps in maintaining a comfortable temperature during summer. Its role as a barrier to heat flow reduces heat loss in winter and heat gain in summer. Inadequate or poorly installed and designed insulation and air leakage are major causes of heat loss in homes. The efficiency of an insulation product is measured by its ability to resist heat transfer, known as the R Value. Higher R values represent better thermal efficiency.

R VALUE - is the measure of thermal resistance. The higher the R-value, the less Heat energy is lost through your insulation.

There are three key areas in your home that significantly benefit from additional insulation:

1 Roof Space

As heat rises, uninsulated ceilings can result in energy loss of between 30% to 35%. Special attention should be paid to openings in your ceilings, such as those around downlights, where heat can escape. The Roof space can be one of the easiest areas to insulate more effectively.

2 Walls

The current building standard for wall insulation in Canterbury is R = 2. At Energy Efficient Homes Ltd, we use insulation rated at R = 2.6 - 2.8 for our standard 90mm timber-framed wall cavity. Additionally, we insulate the service cavity (between the timber frame and GIB), which adds an additional resistance of R = 1.3. This results in our energy-efficient builds starting with an insulation rating of R = 3.9 - 4.1, approximately double the building code requirement. By increasing the frame thickness to 140mm, we can further improve this number, achieving R values of up to 5.7.

3 Foundation

Approximately 12% of a typical concrete floor's energy is lost. Out of this 12%, up to 85% escapes through the foundation's perimeter. If your home has a suspended floor, typically made of timber, the heat loss can be even more significant. Anywhere your home's exterior comes into contact with outdoor air experiences the most energy transfer.

The primary reason for this 85% loss along the edge of a concrete floor is due to its direct connection to outdoor air. The most significant energy loss occurs right beneath the wall's bottom plate because it's the closest point between indoor energy and outdoor air in terms of the floor. The more insulation you add at this point, the better it becomes at preventing the thermal bridge effect, reducing energy transfer.

It's unfortunate that some expensive insulated slabs have a taper at this critical point, providing less insulation. Traditional foundations can let cold seep into your home, causing thermal bridging and cold spots. By insulating the foundation, you create a thermal barrier between the foundation and the surrounding ground, reducing the transfer of energy from your home into the land.

Efficiently insulating foundations can be challenging, as there are many solutions available, but only a few deliver the promised performance.

Insulation Materials

Glass Wool

Standard R Value in 90mm wall: 2.6 (Can achieve R2.8)

PROS

- Lifetime Warranty from Knauf & Pink Batts, 75-year warranty from Brownies.
- BRANZ appraised and made using up to 80% recycled glass.
- Cost-effective insulation method
- Non-combustible and absorbs sound effectively.

CONS

- Prone to moisture absorption and potential mould growth. Moisture must be actively managed to ensure the highest performance once installed.

Sheep's Wool

Standard R-Value in 90mm wall: 2.4

PROS

- Environmentally friendly and renewable material.
- Easy to install and absorbs moisture without losing thermal qualities.
- Cuts carbon footprint due to sourcing from NZ sheep.
- Long-lasting and non-flammable

CONS

- Lower thermal efficiency compared to synthetic alternatives.
- Requires treatment with borax, which may have potential health implications.
- Generally, a premium price-point that can be significantly more than alternatives

Insulation Materials

Polyester

Standard R Value in 90mm wall: 2.2

PROS

- Safe to touch and does not require extensive protective gear during installation.
- Environmentally friendly with recycled materials and no harmful chemicals.
- Durable, long-lasting, and resistant to moisture, insects, and vermin.

CONS

- Lower R Value compared to alternatives, requiring more product for the same performance.
- Installation may cause some respiratory irritation.
- Relative to performance the cost is higher than alternatives

Mammo MODERN INSULATION

GreenStuf®

Polystyrene

Average R Value in 90mm wall: 2.4

PROS

- Easy to cut into shapes and versatile for various construction needs.
- Durable and resistant to compression, making it suitable for slab insulation.

CONS

- Complicated installation process and potential for flammability and toxic fumes.
- Prone to cracking and shedding, posing inhalation risks during installation.
- Due to Polystyrene’s rigid structure it can create gaps because of ill-fitment if done by inexperienced installers.

Insulation Materials

Cellulose

Average R Value in 90mm wall: 2.3

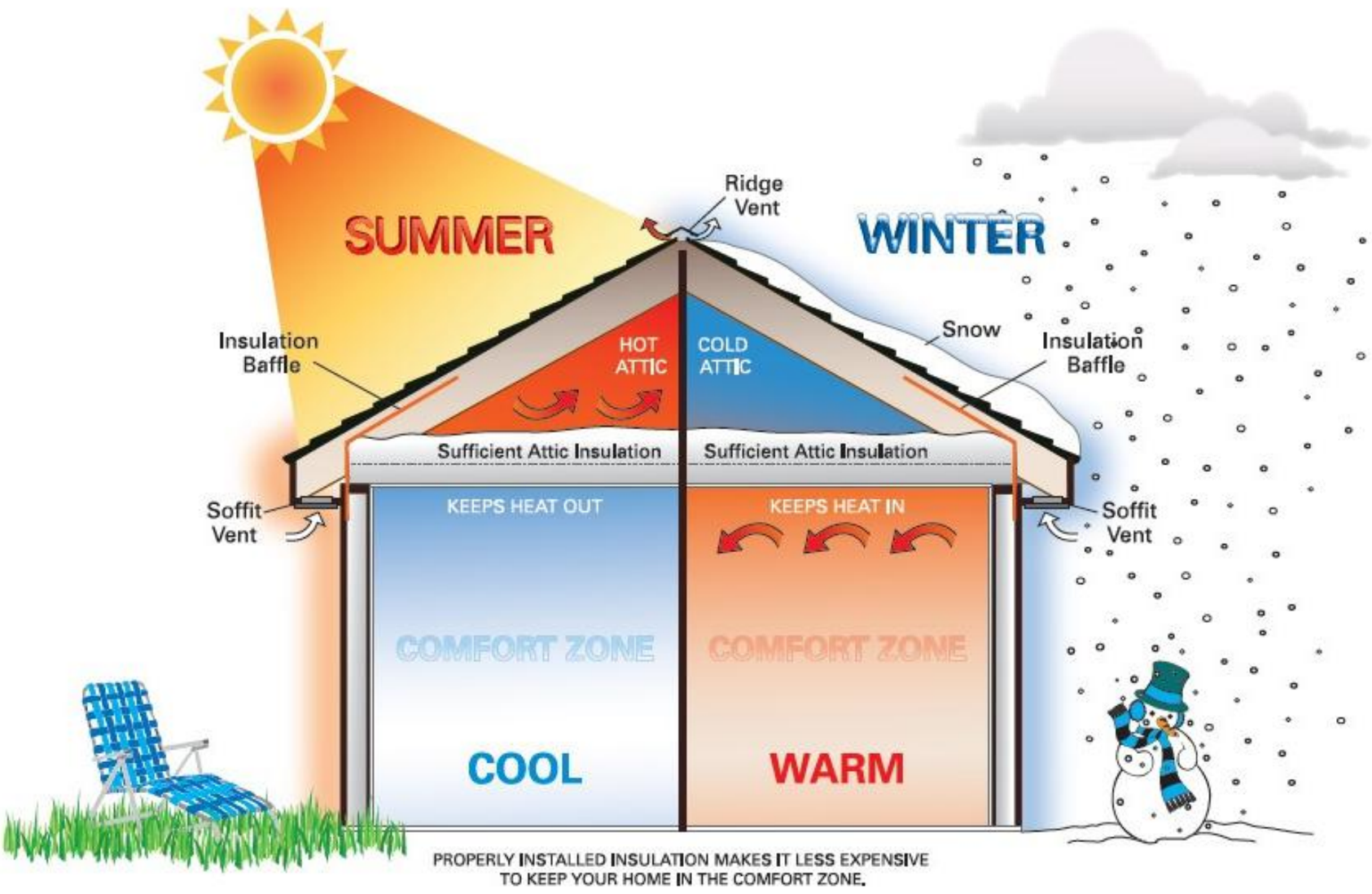
PROS

- No gap system, conforms well to obstructions in walls and ceilings. Unique shapes can be filled very easily
- Cost-effective and easy to retrofit.
- Durable with treatment against insects and vermin.

CONS

- Settling can lead to thermal bridges, reducing effectiveness.
- May absorb moisture, leading to reduced thermal resistance and potential mould issues.
- Installation requires other changes to materials to support the fitment process, this can cause additional cost

When choosing the right insulation material for your energy-efficient home, it's essential to consider factors such as thermal efficiency, environmental impact, installation process, and long-term durability and, lastly, the performance of the product relative to its affordability.



At Energy Efficient Homes Ltd, we can guide you through the best options to suit your specific needs, ensuring a comfortable, sustainable, and future-proof home.

Upgraded Windows

Why Window Choice Is Crucial for Energy Efficiency

When striving for energy efficiency in your home, windows are a critical consideration. Even the most thermally efficient windows available cannot match the performance of even the worst wall allowed under the standard set by the NZ building code. However, poor performing external Windows and Doors will greatly undermine other aspects of the build.

The size, design, and placement of windows are pivotal to achieving good thermal performance and airtightness. Windows represent the weakest point in your home's thermal envelope, making it essential to choose the best windows available within your budget. Options include Thermally Broken Aluminium, UPVC tilt and turn, and Passive House Certified window suites; which is only awarded to products that meet the highest criteria of performance. Each with their own pros, cons, and affordability.

Selecting the right window suite, ensuring a design that maximises this, making them airtight, and with weather-tight

Consider the cost of your windows

While triple glazing is highly effective, the jump in cost from double to triple glazing may not be achievable for many homeowners. On average, triple-glazed windows cost approximately 20% more than comparable double-glazed windows. Triple glazing although it will cost more will improve the performance by over 30% of the windows. It will also make the home much quieter

Double-glazed uPVC windows, paired with a Low-E coating and Argon gas fill between panes, can provide good performance at a more affordable cost. Low-E coatings act as a thermal sieve, blocking infrared light and improving energy efficiency, they trap heat inside in the winter and reflect it outside in the summer. Argon gas, when used with low-E glass coatings, enhances thermal insulation by allowing less heat to be transmitted between the panes. All of these features combine to produce a higher performing window while still being within everyone’s reach.

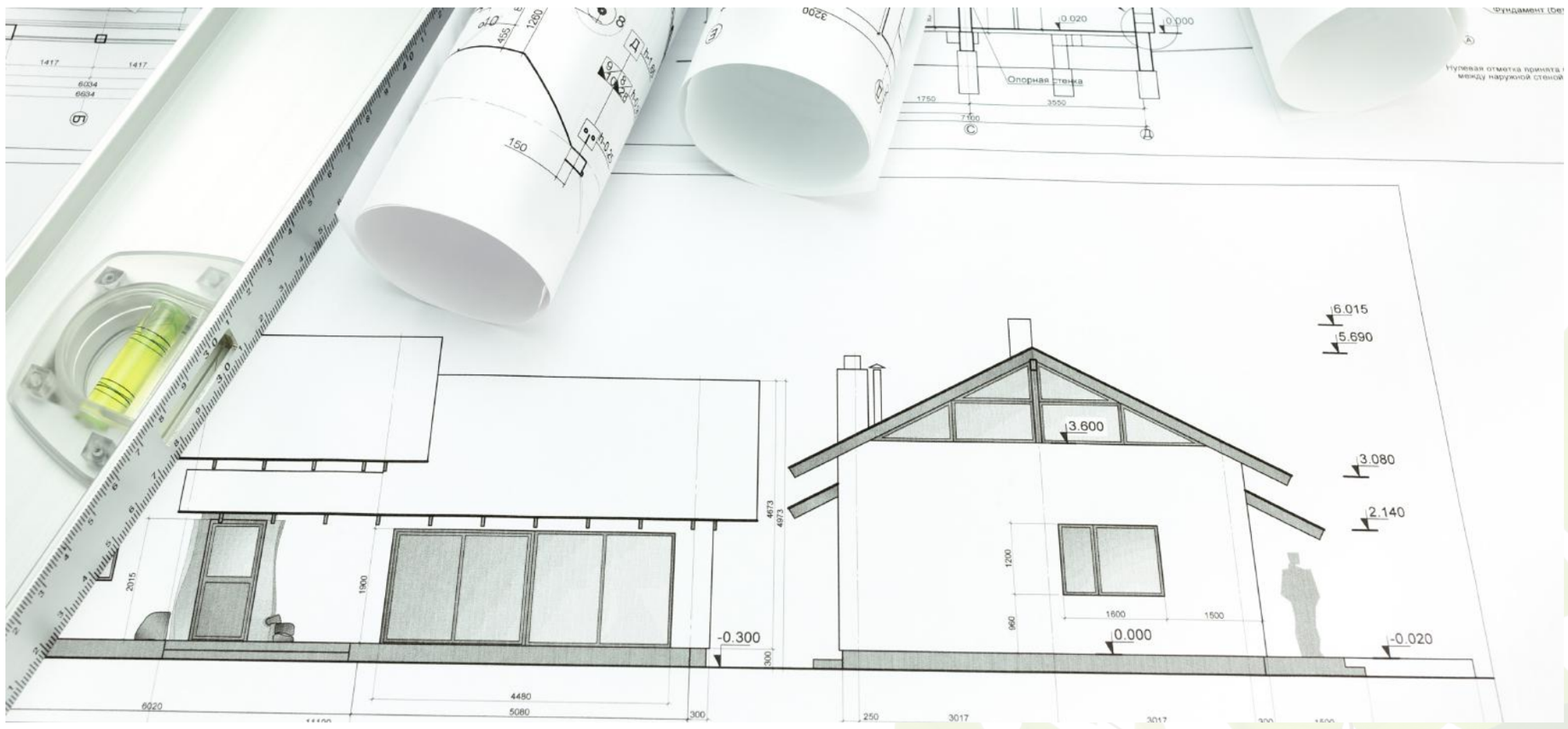
One of the most important features to consider is the tilt and turn aspect of your window choice. Unfortunately New Zealand windows with two hinges and a handle at the other side of the opening window just don't perform well. It will be very difficult to get a good blower door test performance with these types of windows. The windows will leak a lot of energy when a strong wind blows against your home. The tilt and turn systems have a much higher security value and seal much better. Another consideration will be your door choices. French doors because they close into a rebate will perform much better than a sliding door type.

Recessed Windows

One consideration of many designs that is commonly overlooked is the position of Joinery, that is your windows and doors, in the wall. Optimally, your joinery should be positioned in the middle of your wall to perform best. Commonly, in New Zealand, many designs place the window outside of the layer of insulation. This can completely undermine Thermally Broken Window suites while also reducing the performance of other window suite options.

Many solutions to this problem exist, as many different claddings, wall depths and Joinery choices require diverse solutions. Recessing external joinery yields a similar performance benefit to triple glazing while coming in at less than half of the cost. Clearly, it is a stand-out of Energy Efficiency and affordability.

Regardless of the chosen window suite, the implementation of the product should not undermine its performance. At Energy Efficient Homes it is a priority that, regardless of expense, your new home performs to the highest standard that it can.



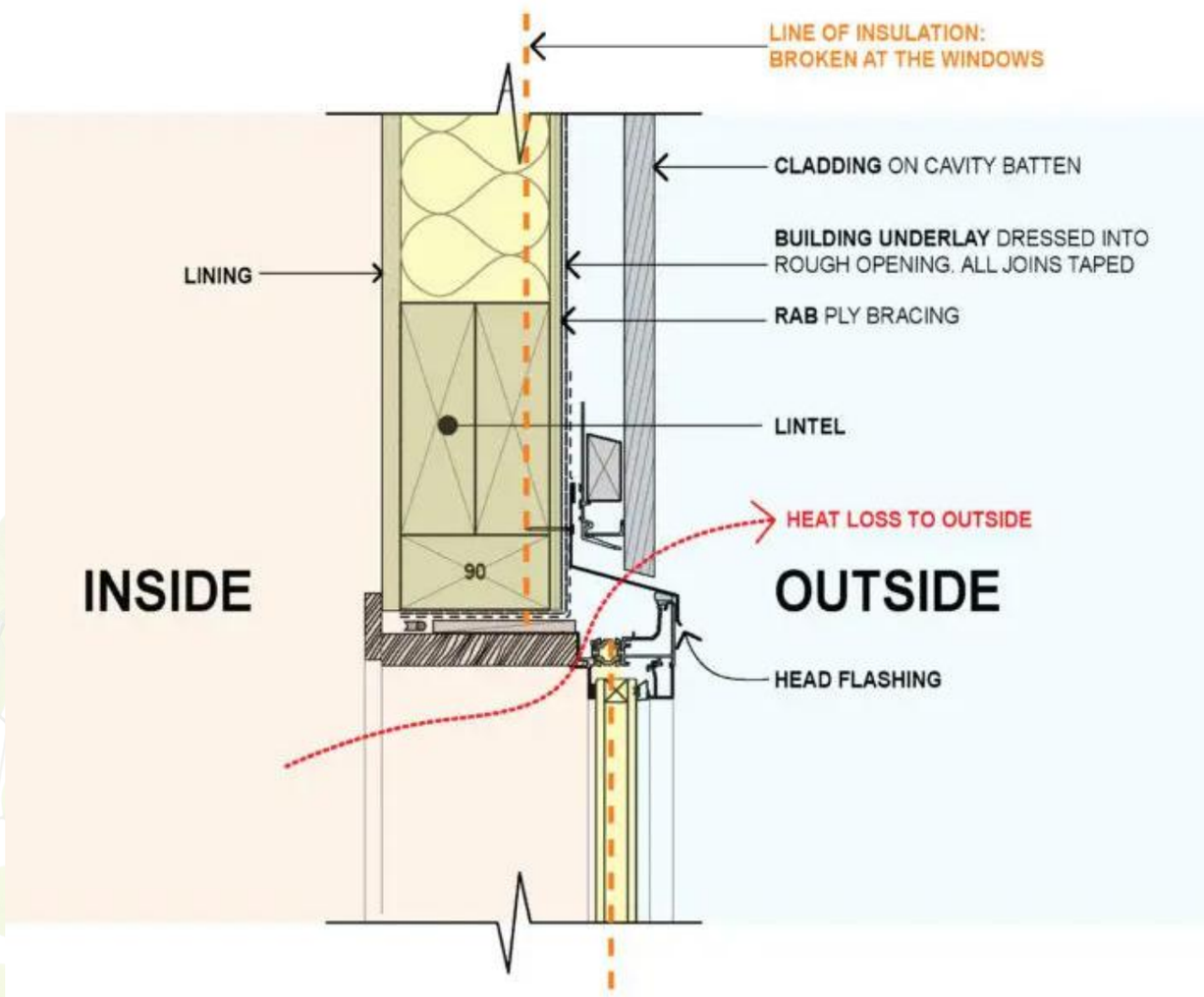
Upgraded Windows

Thermally Broken Aluminium Windows

Aluminium windows, with their slim profile, durability, and affordability, have become popular among New Zealand homeowners as an alternative to timber. Historically, timber joinery was single-pane and very poorly fitted. Over time the timber would warp and twist, further compromising air-tightness. Aluminium solved this problem by offering a dimensionally stable and long lasting product at an affordable price point. Double Glazing further increases performance for many homeowners. However, Solid Aluminium can pose challenges for energy efficiency due to its excellent thermal conductivity, and hence terrible insulation values. Complaints about condensation increased as more homeowners made the switch.

The problem with solid aluminium windows lies in their ability to conduct the temperature of their surroundings. This results in heat transfer through the glass and aluminium frame, creating thermal bridges that allow warmth to escape in winter and for them to act as radiators of heat in summer. Basically, exactly the opposite of what is desirable. To address this, Thermally Broken Aluminium sections are used, where the aluminium is split into exterior and interior parts, connected by a thermal-resistant nylon separator at the glass line. This significantly increases the thermal performance of the suite.

Even with the thermal break, some heat transfer can still occur through the aluminium frame, especially at the standard construction detail for windows with a cavity behind the cladding. This can bypass the thermally broken frame and expose the interior portion to outdoor air temperature. This is where Recessing joinery makes a dramatic difference in realised performance.



To minimize energy loss through the edges of the window, warm edge technology is employed. This technology involves constructing the glazed unit with materials that conduct less heat or cold than traditional windows. Double-glazed windows with warm edge spacers have a warmer internal edge temperature, reducing thermal energy loss and the risk of condensation.

With the incorporation of thermally broken aluminium sections and warm edge technology, aluminium windows can be made more energy-efficient, providing better insulation and reducing condensation issues. These improvements contribute to a more comfortable and energy-conscious living environment. While also being among the most affordable products available.

Finally, aesthetically, many people appreciate the clean and simple look of Aluminium windows. As well as the diverse colour range that Aluminium Powder Coatings can offer. Thankfully, it is possible to have exceptionally high performance with this appearance. Where a hybrid of materials is used.

Upgraded Windows

uPVC Windows

The Choice for Energy Efficiency

uPVC windows offer a range of benefits that make them a superior choice for energy efficiency and overall performance compared to standard or thermally broken aluminium joinery.

Warmer:
uPVC Windows are composed of a series of gaskets. These operate as structural breaks in the framing that greatly improve the thermal performance of the units. Typical R-Values for a Double Glazed uPVC window is R0.77, almost 50% better than the new revised standard for Joinery.

Safer:
European design and certification mean RC2 class certification for burglary protection. Multi-point locking hardware and framing extrusions means that, practically speaking, it is not possible to lever open the door. This also has the added benefit of sleeker design, hiding away screws, rivets and joins.

Quieter:
uPVC is also a far better insulator against sound. With some Window suites offering noise reductions greater than 30dB. This means a quieter, more relaxing indoor environment that is less affected by the outdoor coming and goings of the world. Especially important in our increasingly urban environments.

Airtight:
A standout advantage of uPVC systems is the Airtightness. Maintaining a consistent indoor environment is paramount for Energy Efficiency. It also means better health outcomes and comfort for all household members. The multi-point locking gives a superior seal to any opening joinery. Ingenious solutions such as Lift and Slide doors also mean that large and complex joinery is easily maneuvered while also performing to a very high standard.

Affordability:
Without a doubt, the largest benefit of uPVC systems is their outstanding performance relative to cost. While higher performing solutions do exist; for the average prospective homeowner the performance offered by uPVC while still being affordable is by far the greatest benefit. The benefit of this is obvious, having high performing products at an achievable price is our priority for every build at Energy Efficient Homes. Maximising return on investment for what our clients desire most is crucial to what we do.

Evidently, uPVC windows offer a range of benefits that make them the preferred choice for many Energy-Efficient Projects. With their exceptional insulation, durability, safety and airtight design; all while being within most budgets, uPVC windows provide homeowners with a comfortable and energy-efficient living space while also contributing to a greener and more sustainable future.

Upgraded Windows

Tilt and Turn Windows:

PROS

- Versatile Design and Flexible Ventilation: Tilt and turn windows offer multiple ventilation options with adjustable angles.
- Easy to Use and Maintain: These windows open inwards, allowing for easy cleaning and maintenance.
- Air-Sealed for Insulation: Tilt and turn windows generally have better air seals, reducing water leakage and cold drafts.
- Safety Features: These windows can be tilted inward, making them suitable for homes with small children.

CONS

- Wider Frames: Tilt and turn windows may have wider frames due to the complex opening mechanism.
- Consider Installation Location: These windows open inwards, so ensure no obstructions hinder their opening.
- Safety Concerns: Wide aperture when fully open could be a safety concern in children's rooms.

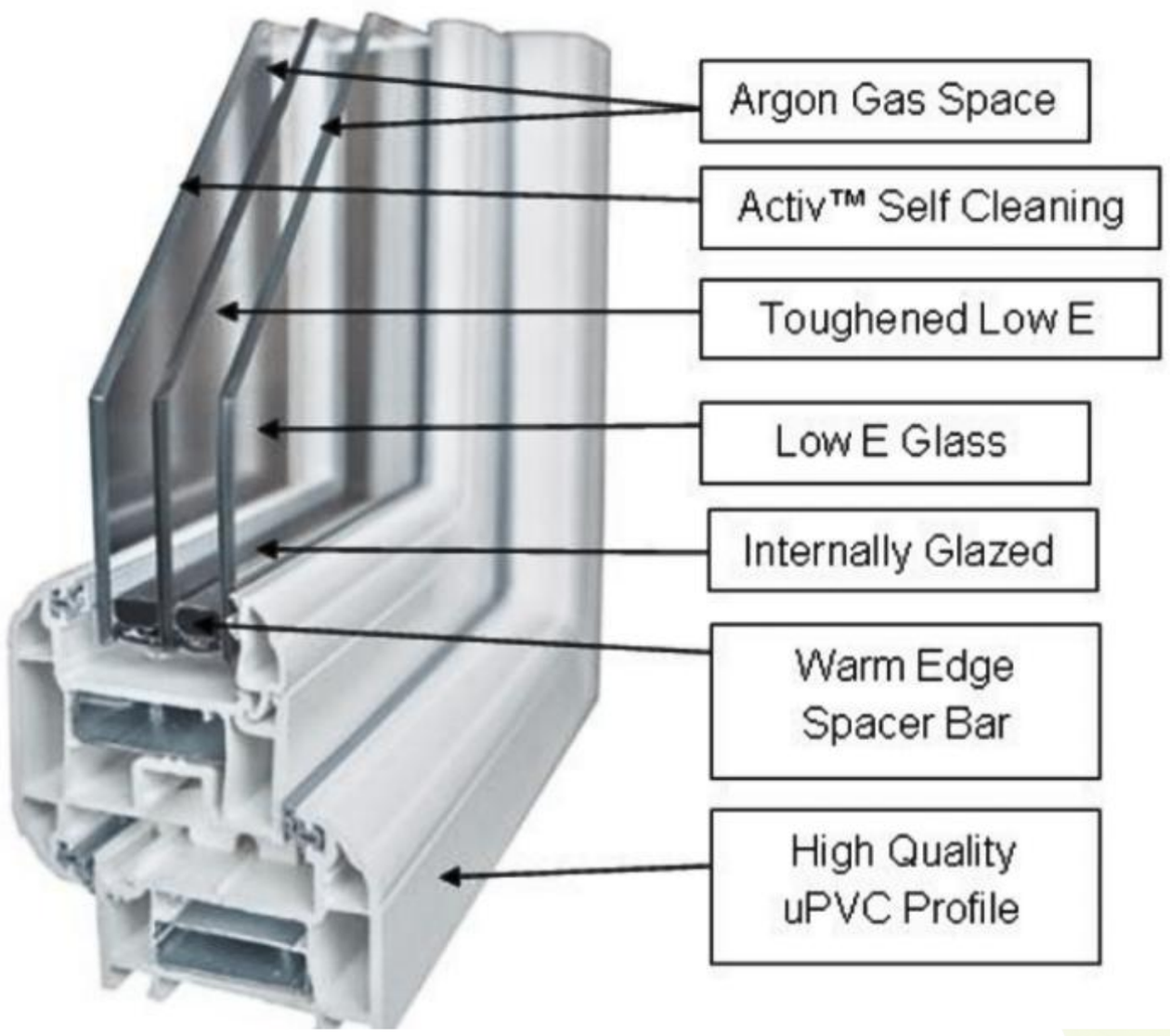
Advantages of Triple Glazing:

1. Improved Heat Efficiency: Triple glazing offers better thermal insulation compared to double glazing. Not only having an extra insulating pane, typically Triple glazed window suites will also have an additional layer of Argon (or Krypton) fill and Low Emissivity (‘Low-E’) coating, further benefiting the performance of the suite.

2. Enhanced Noise Reduction: The third pane in triple glazing provides better soundproofing.

3. Elimination of Hot and Cold Spots: Triple glazing helps reduce temperature differences within the home. As windows are generally the weakest link in the thermal efficiency chain, improvements in this area can make a significant difference.

4. Increased Condensation Control: Triple glazing reduces condensation issues compared to other window types. However, the only way to truly deal with the moisture issue so many New Zealand homes have is to install a balanced Ventilation system.



Upgraded Windows

Passive House Certified Windows and doors:

Passive House Institute offers certification for Joinery that achieves the very high standard that they set for performance.

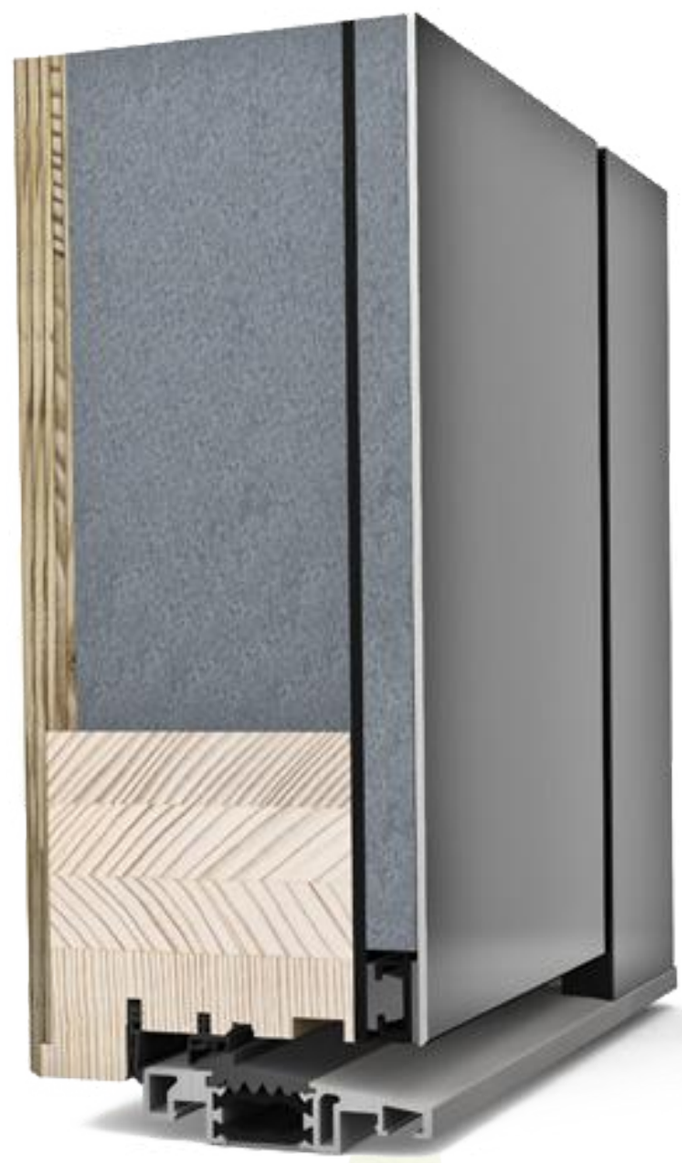
Without exception these products excel in all aspects of performance, though principally that is Thermal performance and Air-tightness. Typically these are composed of either uPVC or Engineered Timber, with hybrids also common.

While performance is unparalleled it is of utmost importance that their performance is not undermined by their poor installation or by other aspects of the design. It is exceptionally important that an experienced specifier oversees the implementation of the product; they are a significant investment and a lack of knowledge in this regard can ruin the return that the products could have achieved.

Aesthetically a number of options are available. It is common for the systems to have an aluminium facing on the exterior to allow for a broad range of colour choices and appearances. However, due to the high standard set by Passive House to achieve certification, not all window functionalities of more-affordable suites are available.

The common examples are Bifolds, Over-taking doors and stacker sliders. This is due to these functions greatly compromising the performance of the product. Generally, for Passive House Projects, the Thermal Performance and Airtightness is the priority; so these functions are not available without seriously undermining those aspects.

However, for Energy-Efficient builds they offer an exceptionally high level of performance in a much needed area; the external joinery, which is in almost all cases the weakest link when it comes to Thermal Efficiency and Airtightness.



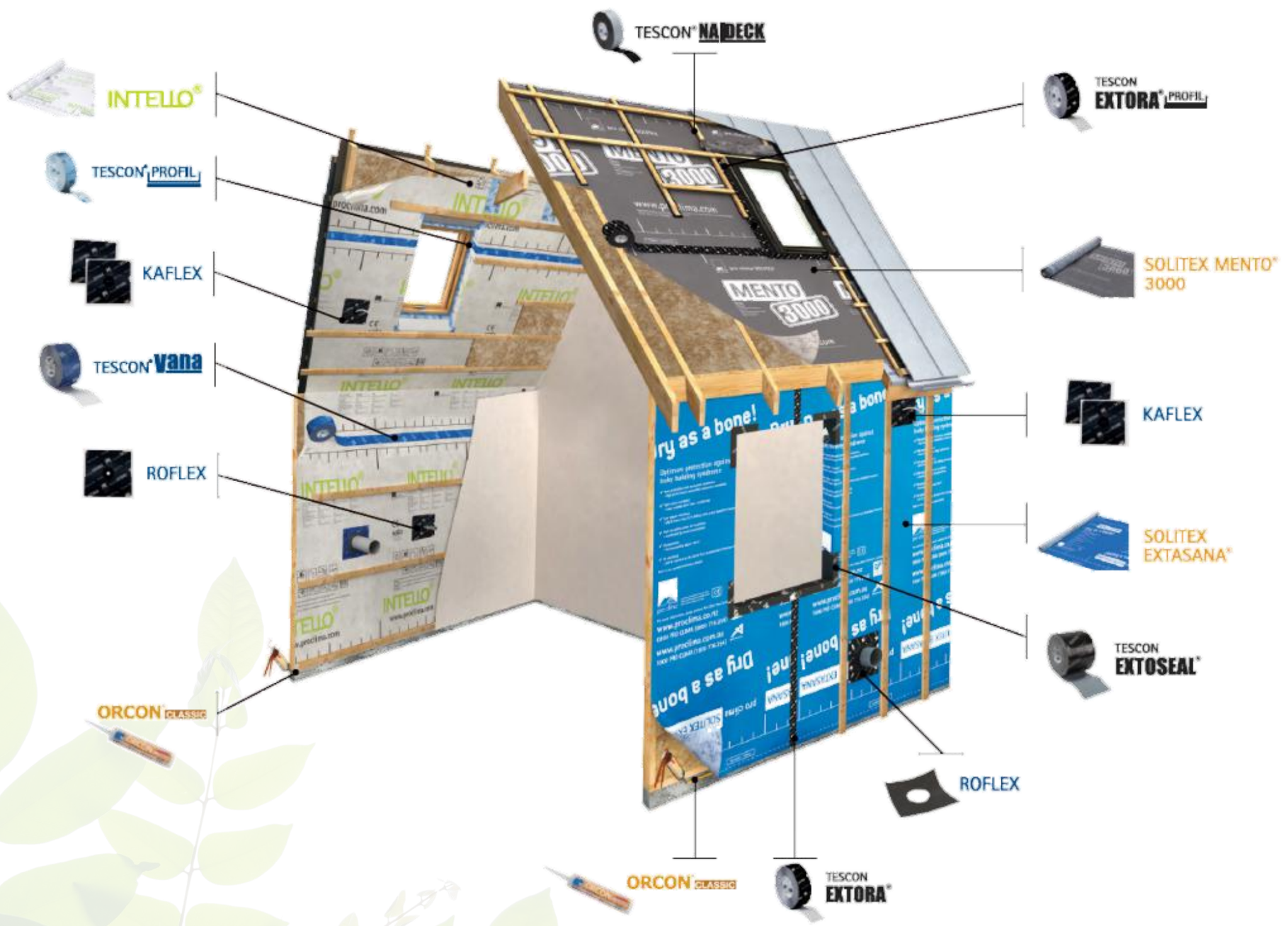
Air Tightness

Proclima Wrap System

Ensuring a Dry and Airtight Home

Currently, many new builds are often constructed to the minimum standard, leading to walls that are not waterproof or airtight. Moisture can easily infiltrate the framing, causing problems such as condensation and mould growth in the insulation. Moisture-absorbed insulation becomes less effective and may require replacement. A lack of air tightness also means a less stable indoor environment, meaning more heat loss, dampness and energy bills. Energy Efficient builds solve this issue by using moisture and vapour barriers.

To optimize the performance of your walls we use ProClima's range of products, each serving a specific purpose. For the exterior of your walls, we use a product called SOLITEX EXTASANA, a waterproof material that ensures no moisture from outside enters the wall cavity while allowing any moisture within the walls to escape. This operates much like a rain jacket for your home.
For Air-tightness on the inside, we use INTELLO PLUS, which is an 'open-cell' vapour barrier. This Engineered fabric prevents vapour from inside the house from moving into your framing and insulation. Again, moisture only travels one way: out of your framing.



Blower Door Test

Ensuring Superior Air Tightness

In certified passive houses, air tightness must be less than 0.6 air changes per hour (ac/hr). We proudly guarantee that our Energy Efficient builds will have less than 1 ac/hr, with many beating the passive house requirement. For reference, a new house built to code will have an average of 4 to 10 ac/hr.

To test the air tightness of a building envelope, we conduct a Blower Door Test on all our Energy Efficient builds. This test involves using a powerful fan mounted in an exterior door frame, which accurately measures the amount of air required to maintain a constant pressure of 50 pascals (approximately equivalent to 32.5 kph wind). The test includes pressurising and depressurising the building, with a minimum of 7 readings taken to calculate the average of both tests. We perform the Blower Door Test after installing the Pro Clima Intello airtightness membrane, and before fixing the GIB. This allows us to detect and fix any breaches in the building's airtightness. This assures a system that not only performs in theory, but in application also.

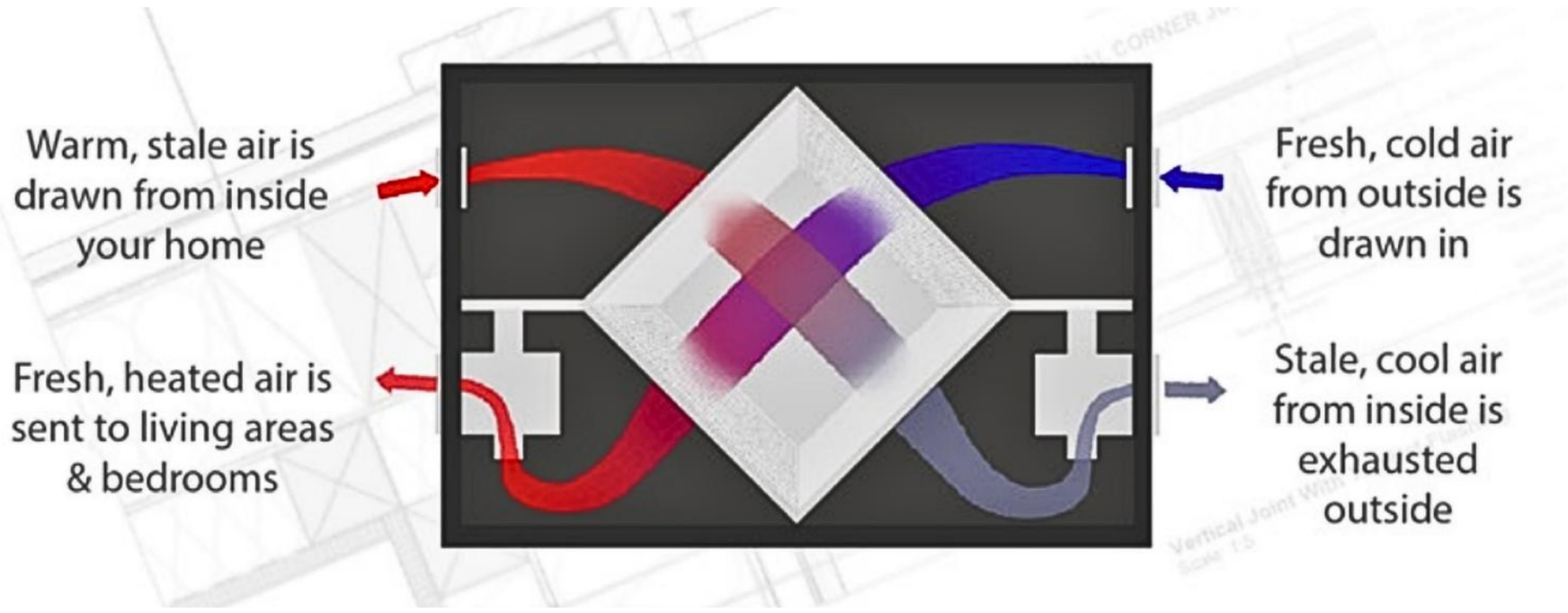
Our blower door testers are certified and registered with ATTMA, ensuring the accuracy and reliability of the results.

Heat Recovery

The Importance of a Heat Recovery System

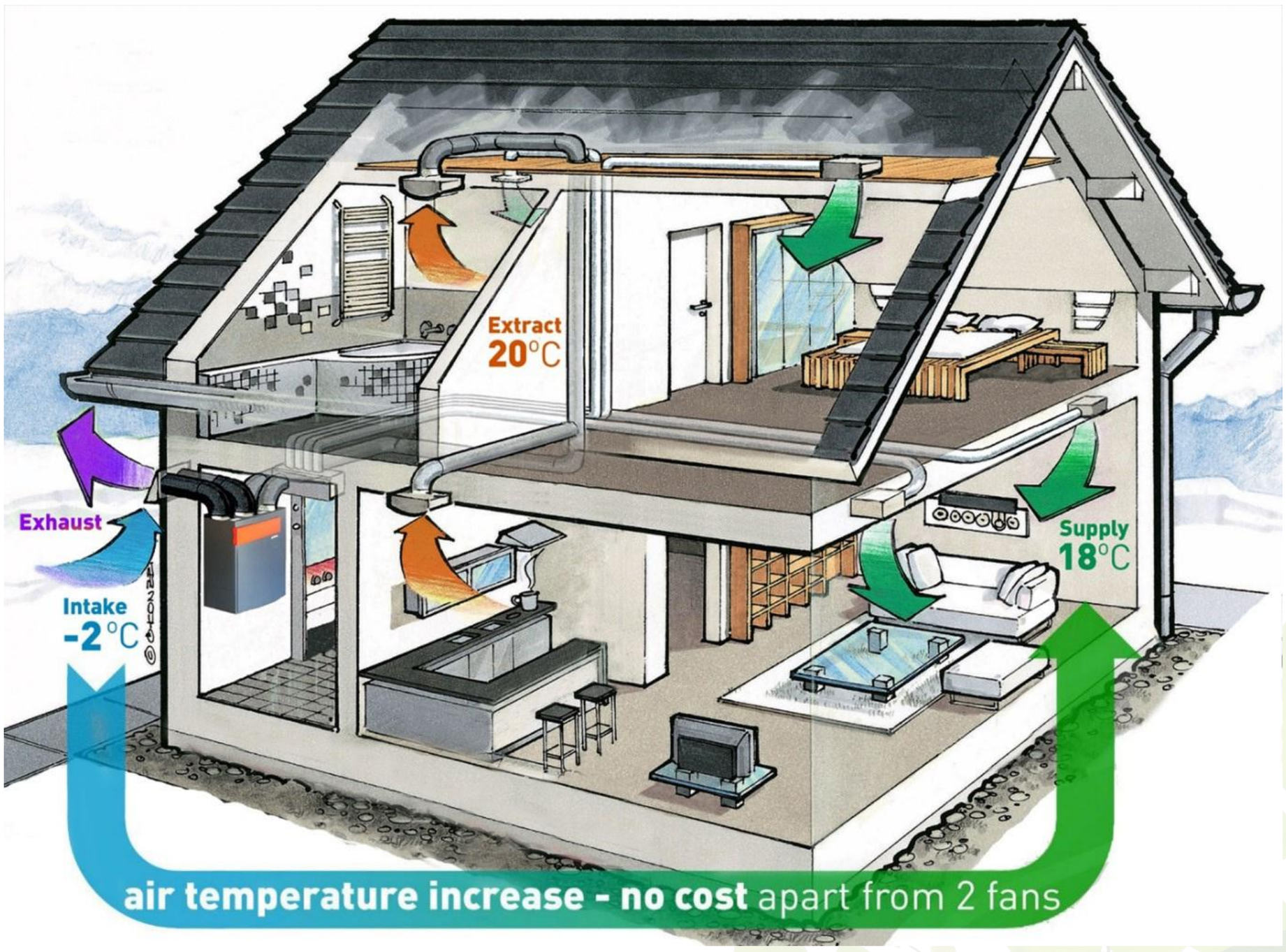
Once we have made a house airtight Mechanical Ventilation Heat Recovery System (MVS) act as the lungs of your home. With a low voltage fan running 24 hours a day these systems bring fresh filtered air into your house year round while removing the damp stale air. The input and output volumes are balanced so that the house does not become pressurised. Heat is passively transferred from the extracted air to the fresh air being supplied from outside. These units can recover up to 96% of the heat from the air leaving the home, meaning the fresh air that is supplied to the living rooms and bedrooms comes in close to the ambient temperature of the home. This means minimal heat loss to the outside environment while removing moisture, purifying and balancing all areas of the home.

Heat recovery units recover the heat generated from activities such as cooking and showering and use this precious energy to warm your home. Incoming air is warmed with very little additional heating required to maintain an ambient temperature in your home. The fresh air is run through a series of filters to remove pollutants such as pollen or ash from fireplaces. This results in a healthier home for the occupants and as an added bonus less dust to be cleaned. The only operating cost of the system is a fan and it is extremely affordable to run.



A chief concern of homeowners in New Zealand has always been condensation and moisture. Crying windows are a product of poor ventilation, not a lack of insulation as is commonly believed. No matter the standard of your Doors and Windows, if you do not deal with the moisture issue itself you will suffer from condensation somewhere. Commonly that is on windows, as these are the coldest points. Improving the joinery without ventilation will only shift the problem, typically to within the walls. This causes mold to grow uninterrupted and drastically diminishes the performance of insulation products.

The solution is a balanced heat recovery system that removes moisture from the air as it arises. Positive pressure systems only exaggerate the ingress of moisture into the walls for standard homes and are not possible to implement in air-tight designs. Balanced heat recovery solves this problem in every regard. drier homes are healthier as mold cannot grow and humidity over 60% allows viruses and bacteria to thrive more readily. The air is also easier to heat and cool when desired as less energy is required to change its temperature. They are an essential component in healthy living, not just for Energy Efficiency.



Thermal Bridging

Understanding and Addressing Heat Loss

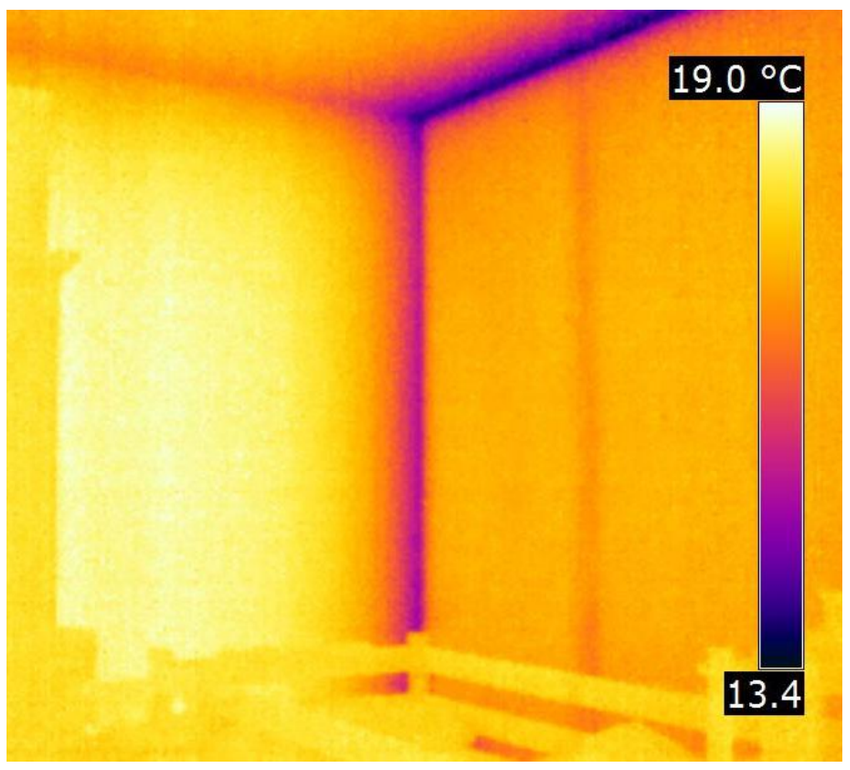
What is a Thermal Bridge?

A thermal bridge occurs when materials which are better conductors of heat are allowed to form a 'bridge' between the inner and outer face of a construction (across an insulation layer). Thermal Bridges create a sort of ‘highway’ for heat to be transmitted, small points can ferry large amounts of heat. The most common example would be an aluminium window frame as mentioned previously. Aluminium is a much better conductor than the wooden framing, insulation and even glass around it so it acts as a thermal bridge. Common thermal bridges are Steel framing and fixings, but when performance needs to be exceptionally high, even Timber elements can start to rapidly undermine overall performance.

Types of Thermal Bridges

Geometric Thermal Bridges:

These occur due to the geometry of the thermal envelope, causing increased heat loss in specific locations. Examples of geometric thermal bridges include external wall corners, eaves junctions, and areas around window and door openings. While geometric thermal bridging is unavoidable, it can be minimized by keeping the building form simple.



Construction Thermal Bridges:

Construction thermal bridges occur when there is a physical material, gap, or component that passes through the insulation and conducts heat better than the insulation itself. Examples include rafters passing through the thermal envelope to support the eaves, timber studs or joists within the insulation zone, and lintels that interrupt cavity insulation. Careful design can help avoid or minimize the construction of thermal bridges, but any that do occur will contribute to measurable heat loss. Passive builds must calculate and account for the heat loss from these thermal bridges.

Thermal Bridging

Problems Caused by Thermal Bridges

- Unwanted heat transfer: Thermal bridges act as weak points in the thermal envelope, leading to considerable heat loss in winter and heat gain in summer.

- Condensation and cold spots in the house: Heat escaping through thermal bridges causes internal surface temperatures to drop. This creates cold spots and increases relative humidity within the house which leads to condensation on internal surfaces and promotes mould growth.

- Moisture in the walls: As thermal bridges pass through the insulation envelope they can create temperature differences resulting in condensation within your walls. This can lead to unseen problems and efficiency loss.

Health and Comfort Implications

Cold spots are uncomfortable and can cause draughts. Condensation and mold growth from thermal bridges can negatively impact indoor air quality and lead to health problems for the occupants.

Combatting Thermal Bridging

Addressing thermal bridging starts with careful design and elimination as much as possible. In Passive House construction, the goal is to have a continuous layer of insulation, however, this is very hard to achieve. The best designs mitigate the effects so that the performance of the project is not hindered by their presence. Calculating their impact by using software when planning a Passive House (PHPP) is vital. The knowledge gained from using this system of design is what allows us to ensure every Energy Efficient house we produce has as few thermal bridges as possible.

How We Do It

Meet Our Passionate Team

At the heart of our mission to provide Cantabrians with truly efficient builds is our director, Robert Whitehouse. With his expertise and certification in Passive Trades, he is dedicated to delivering Energy-Efficient homes that not only work but excel. Alongside him, our team boasts skilled Passive House trained Architectural Designers.

A Commitment to Constant Improvement

In this era of continuous innovation, construction methods are ever-evolving. Our team stays ahead of the curve by constantly staying informed about the latest alternatives and advancements in building techniques. We regularly attend Passive House Conferences worldwide to remain updated and bring back the best practices to implement in our projects.

Empowering Our In-House Teams

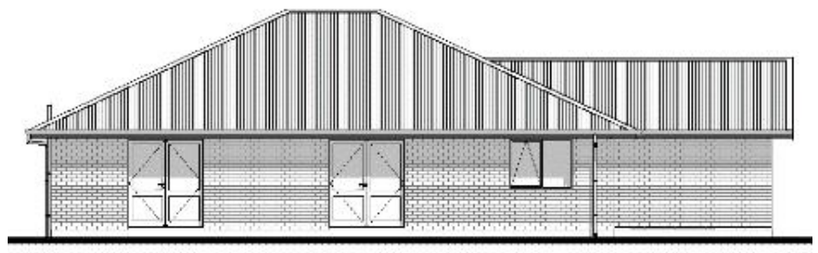
A successful Energy-Efficient build relies not only on impeccable design but also on precise execution during the construction process. To ensure the highest standard of craftsmanship, our in-house build teams undergo frequent training. Understanding that Passive build techniques are as crucial as the design itself, we prioritise knowledge transfer to our builders and subcontractors. The Passive House Institute's findings indicate that the most common failure of Passive Homes worldwide stems from installers and builders not comprehending the intricacies outlined in the architects' plans. To safeguard your investment, we address this issue proactively.

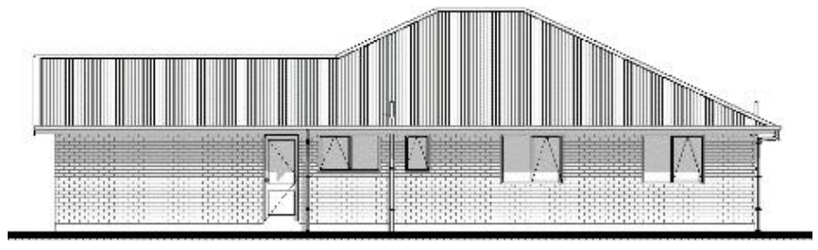
Strategic Orientation for Optimal Efficiency

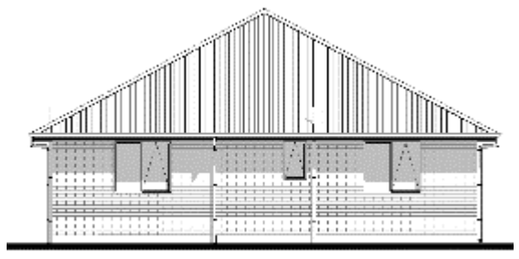
When embarking on the design of your Energy Efficient build, our team begins by carefully analysing the orientation of your site. Achieving the right balance of maximizing solar energy while preventing overheating is crucial. Simple but effective principles, like minimizing or shading windows to the North, can significantly impact the overall efficiency of your home.

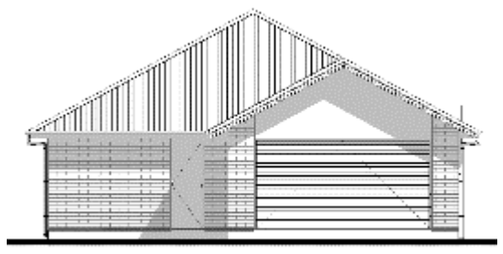
Mastering the Floor Plan

At the core of creating a highly functional Energy Efficient or Passive build lies the design of your floor plan. Key to success is the principle of maximizing air volume to surface area. While living in a ball-shaped home might not be practical, we craft well-designed, attractive homes that leverage these principles, harmoniously integrating with the surrounding elements.


WEST ELEVATION


EAST ELEVATION


NORTH ELEVATION


SOUTH ELEVATION

How We Do It

Leveraging PHPP for Success

To ensure the success of your Passive build, we rely on the indispensable Passive House Planning Package (PHPP) software. Our skilled designers use this tool to calculate anticipated heat loss and identify areas where further improvements can be made, guaranteeing the utmost efficiency in your home.

The Guiding Principles: 5 Passive House Principles

Regardless of whether you opt for a full Passive Home or aim for Energy Efficiency, our team diligently considers the five fundamental Passive House Principles throughout every stage of your build. These principles serve as our guiding light, ensuring that your home achieves the highest levels of comfort, sustainability, and energy efficiency.

Get in Touch

If you are ready to take the next step towards building your dream home, we are here to help. Whether you're interested in a full Passive House design or a more flexible Energy Efficient design, we have the expertise and experience to guide you through the process. From initial orientation and floor plan design to selecting the best materials and technologies, we leave no stone unturned in ensuring your home is built to the highest standards of sustainability and performance.

Don't miss the opportunity to have an Energy Efficient or Passive Home that not only benefits the environment but also enhances your daily living experience. Contact us today to schedule a consultation and explore the possibilities of building your dream home with us.

Robert Whitehouse
Director

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