

# THE HEALTHY HOME DESIGN GUIDE


A holistic guide for people and planet





## HEALTHY HOME DESIGN MATRIX

The definitive summary table of the BASE, BETTER, BEST tables...

**DESIGN OPTIONS**

Discipline	Key Areas	Applicable Building Code & Acceptable Solution	Base (Healthy Home)	 Better (Superhome)	 Best (Superhome)	Chosen Option / Comments
Design	Access and pathways	D1/AS1	Design workshop with client.	Design Workshop with client Superhome designer and Engineer.	Design Workshop(s) with Client, Superhome Designer, Builder and Certifier.	
Universal Design			<b>Easy access for most people. Incorporate design attributes in key areas.</b>	<b>Easy access &amp; future proofed (adaptable) for different life stages.</b>	<b>Fully wheelchair accessible or adaptable to be fully wheelchair accessible.</b>	
	Access and pathways	D1/AS1	Level threshold entry. Consider access and pathways including a minimum clear opening width of 810mm (860mm door leaf).	Level threshold entry and living areas to outdoor areas. Sufficient widths of access and pathways including a minimum clear opening width of 810mm (860mm door leaf).	Level threshold entry and living areas to outdoor areas. Accessible parking space and ramp to entrance with wide clear opening width (minimum 860mm door leaf).	
	Moving around the home	D1/AS1	Corridor Width 1050mm (finished surface width). Consider having a minimum clear opening door width of 810mm (860mm door leaf).	Corridor Width 1050 - 1200mm (finished surface width). Minimum clear opening door width of 810mm (860mm door leaf).	Corridor Width 1200mm min (finished surface width). Minimum clear opening door width of 810mm (860mm door leaf) with 300mm clear space on the handle side.	
	Bathrooms	N/A	At least one bathroom and WC (if separate) located on ground/entry level, consider safety measures including slip resistant flooring.	At least one bathroom and WC (if separate) located on ground/entry level. Future-proofed for easy access for different life stages. High levels of safety on floor material and position of fittings.	At least one fully accessible bathroom and WC (if separate) located on ground/entry level. Or adaptable to be fully accessible design in future.	
	Kitchens and Laundries	N/A	Kitchen and laundry located on ground/entry level. Consider safety around clear space, floor material and position of appliances. A good amount of storage. At least 1200mm between fixed work surfaces, any appliances and base units. Consider a floor drain in laundry. Consider a plinth for front-loader washing machine (and clothes dryer if side by side).	Kitchen and laundry located on ground/entry level. High levels of safety around clear space, floor material and position of appliances. A good amount of the storage. 1200mm - 1500mm between fixed work surfaces, any appliances and base units. Floor drain in laundry. Consider a plinth for front-loader washing machine (and clothes dryer if side by side).	Fully accessible kitchen and laundry located on ground/entry level OR adaptable to be fully accessible in future. A clear turning circle of 1200mm (toe space height 250mm) - 1500mm between fixed work surfaces, any appliances and base units. A floor drain in laundry. Consider a plinth for front-loader washing machine (and clothes dryer if side by side).	
	Bedrooms	N/A	At least one bedroom or a multi-function space (that could be used as a bedroom) is located on the ground/entry level and, ideally, adjacent to an accessible bathroom. Allow for 800mm of clear space either side and at the end of the bed. Sufficient space to access any wardrobes or walk-in wardrobe.	At least one bedroom or a multi-function space (that could be used as a bedroom) is located on the ground/entry level and, ideally, adjacent to an accessible bathroom. Allow for 800mm of clear space both sides and at the end of the bed. Sufficient space to access any wardrobes or walk-in wardrobe.	At least one bedroom is located on the ground/entry level, and ideally, adjacent to an accessible bathroom. Allow for 1100mm of clear space both sides of the bed for bed-making and 900mm all around. Clear space of 1500mm minimum turning circle within the room. Sufficient space to access any wardrobes. A walk-in wardrobe with minimum clear space of 1200mm x 1500mm.	
	Fitting and hardware	N/A	Consider door handles (lever action) at the same height as the switches throughout the building for intuitive usage (between 900mm and 1200mm above finished floor level). Consider the height of all switches and power points etc. Consider the heights of windows and window hardware and easy to use taps and hardware for kitchens and bathrooms.	Door handles (lever action) at the same height as the switches throughout the building for intuitive usage (between 900mm and 1200mm above finished floor level). Sliding doors should have easy to use hardware. Position power points between 300mm and 500mm, above finished floor level (up to 1200mm e.g. in bathrooms), and at least 500mm from internal corners. Consider the heights of windows and window hardware.	Door handles (lever action) at the same height as the switches throughout the building for intuitive usage (between 900mm and 1200mm above finished floor level). Sliding doors should have easy to use hardware. Position power points between 400mm and 500mm, above finished floor level (up to 1200mm e.g. in bathrooms), and at least 500mm from internal corners. The heights of windows and window hardware should be lower than 1200mm.	

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Site & Location	Overheating and shading	N/A	Consideration given to shading from midday summer sun.	Modelling of thermal performance including overheating.	Modelling of thermal performance including overheating.	
Size and Footprint	Size and Footprint	N/A	Consider spatially efficient uniform regular layouts to cut down wasted space. Consider how often spaces like spare bedrooms are actually going to be used.	Consider spatially efficient uniform regular layouts to cut down wasted space.	Consider spatially efficient uniform regular layouts to cut down wasted space.	
	Orientation		Consider whole house orientation to suit solar gain and site specific requirements. Positioning of room types appropriately. For example, ideally bedrooms not on the west side so they don't overheat.	Consider whole house orientation to suit solar gain and site specific requirements. Positioning of room types appropriately. For example, ideally bedrooms not on the west side so they don't overheat.	Consider whole house orientation to suit solar gain and site specific requirements. Positioning of room types appropriately. For example, ideally bedrooms not on the west side so they don't overheat.	
Ground Conditions	Ground Conditions	NZS3604:2011 "Good Ground" or SED	NZS3604:2011 "Good Ground" or SED.	Deep testing if liquefaction damage is possible in a future large earthquake.	Deep testing if liquefaction damage is possible in a future large earthquake.	
Resilience	Resilience	B1	There should be no damage requiring repair following an event that matches but not exceeds a 1:25 year return period event. Ensure services are considered too.	There should be no damage requiring repair following the home being sufficiently tested to a 1:25 year return period event. Ensure services are considered too.	SED tailored solution to suit agreed parameters for low damage design.	
	Durability	B2	B2	To exceed the requirements of B2 where possible. Maintenance plan, RAB and internal airtight layer.	To exceed the requirements of B2 where possible. Maintenance plan, RAB and internal airtight layer.	
Foundations and Floors	Foundation Design TC1	TC1: B1/VM4 and NZS3604:2011	SED insulated NZS3604 +FLS.	SED Insulated stiffened foundation +FLS.	SED Insulated stiffened foundation designed to accommodate 50mm of settlement at SLS +FLS.	
	Foundation Design TC2	TC2: MBIE Guidance	SED Insulated MBIE Guidance +FLS.	SED Insulated MBIE Guidance +FLS.	SED Insulated stiffened foundation designed to accommodate greater than 50mm of settlement at SLS +FLS.	
	Foundation Design TC3	TC3: MBIE Guidance	SED Insulated MBIE Guidance +FLS.	SED Insulated MBIE Guidance +FLS.	SED Insulated stiffened foundation designed to accommodate 100mm of settlement at SLS +FLS.	
Walls and Panels	Walls and Panels	B1/VM1 & NZS3604:2011	Internal and external airtightness and moisture management layers included.	Internal and external airtightness and moisture management layers included.	Internal and external airtightness and moisture management layers included.	
	Framing (External Wall)	As per table 8.2 NZS3604:2011 (commonly 90x45@600crs)	90x45mm framing to NZS 3604:2011 using GIBFIX system. (3) Or 90x45mm framing with Internal services cavity consisting of 45mm horizontal battens and min 40mm structural cavity battens with ex 140mm bottom plate to provide for correct hold down fixings or 115mm SIPS panels.	140x45mm framing to NZS3604:2011 GIBFIX system and non-essential dwangs/nogs omitted with internal services cavity consisting of 45mm horizontal battens with 45mm insulation layer and RAB (Rigid Air Barrier) or factory panelised system (eg Ecopanel) or 165mm SIPS panels.	SED solution to suit parameters. verified by energy modelling.	
Bracing Design	Walls	NZS3604:2011 / GIB Ezybrace (Does not consider low damage design)	90mm framing or 140mm framing elsewhere with specifically engineer designed (SED) plasterboard or rigid air barrier bracing or 115mm SIPS panels.	140mm framing with specifically engineer designed (SED) plasterboard or rigid air barrier bracing or factory panelised systems or 165mm SIPS panels.	SED tailored solution to suit agreed parameters for low damage design.	
Cladding	Roof	Cold Roof	Correctly designed cold roof.	Warm roof or ASV.	Warm roof or ASV with intelligent air barrier.	
Cladding	Walls	All suitable claddings	All claddings are suitable depending on ground conditions. Consider sustainable materials and waste mitigation. (Refer to these sections)	All claddings are suitable depending on ground conditions. Utilise sustainable materials, mitigate waste. (Refer to these sections)	Lightweight claddings are more earthquake resilient than heavy weight claddings. Utilise sustainable materials, mitigate waste. (Refer to these sections)	

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Windows & Doors	Window U Values (W/m²K)	3.8	1.8	1.8	0.9	
	Window R Value	0.26	0.55	0.75	1.0+	
Airtightness	Window Types	Single / Double Glazed any material not recessed.	Thermally Broken Double Glazing Low E, thermal spacer.	Thermally Broken Double Glazing Low E excel, Argon Filled, thermal spacer.	Thermally Broken Double or Triple Glazing , Argon Filled, Low E.	
	Installation	In cladding cavity.	Inline with insulation.	Inline with insulation.	Inline with insulation.	
Air Quality and Ventilation	Permeability Target (Blower Door testing and lodgement to ATTMA TSL1)	No Requirements.	< 3.0	1.5	0.6	
	Ventilation	5% area Natural ventilation of occupied spaces providing an openable area to the outside of no less than 5% of the floor area.opening window.	Bathroom and separate Kitchen extraction to outside plus whole house ventilation system with fresh air supply (NOT sourced from roof cavity).	Whole house MVHR ventilation designed and commissioned by a Superhome Participant.	Whole house MVHR ventilation designed and commissioned by a Superhome Participant and verified by monitoring.	
	Recommended Flow Rate per occupant	Living areas: 7.5 L/s per person Kitchens: 50 L/s intermittent or 12 L/s continuous or openable windows Baths, Toilets: 25 L/s intermittent or 10 L/s continuous openable window Garages: 50 L/s per car.	8l/s/p	10l/s/p	10l/s/p	
	Air Quality - Temperature	Safeguard people from illness caused by low air temperature by providing an adequate controlled interior temperature of no less than 16degC.	Temperature in the 18-24 degrees C range 75% of the time. (verified by monitoring).	Temperature in the 18-24 degrees C range 80% of the time. (verified by monitoring).	Temperature in the 18-24 degrees C range 90% of the time. (verified by monitoring).	
	Air Quality - Humidity	N/A	Relative humidity within Healthy range of 40% to 60%, 75% of the time (verified by monitoring) .	Relative humidity within Healthy range of 40% to 60%, 80% of the time. (Verified by monitoring).	Relative humidity within Healthy range of 40% to 60%, 90% of the time (verified by monitoring).	
	Air Quality - CO <sub>2</sub>	N/A	CO <sub>2</sub> less than 1000ppm 80% of the time. (Verified by monitoring).	CO <sub>2</sub> less than 1000ppm 80% of the time (Verified by monitoring).	CO <sub>2</sub> less than 1000ppm 90% of the time (Verified by monitoring).	
Insulation	Insulation is required to achieve	No Requirements other than min R values.	45kWh/m²/yr	30kWh/m²/yr	15kWh/m²/yr	
Acoustics	Acoustics	N/A	Consideration of the effect of hard surfaces in living areas. Carpet or rugs in bedrooms.	Consideration for the inclusion of acoustic panelling in living areas.	Acoustic modelling of internal spaces.	
Heating & Cooling	Heating	N/A	Heating System sufficient to heat the house to maintain temperature in the 18-24° range 75% of the time. (verified by monitoring).	Heating System sufficient to heat the house to maintain temperature in the 18-24° range 90% of the time. (verified by monitoring).	Heating System sufficient to heat the house to maintain temperature in the 18-24° range 100% of the time. (verified by monitoring).	
Water	Shower, toilet, taps	N/A	Shower, toilet and taps WEL rated (to Homestar requirements).	Shower, toilet and taps WEL rated (to Homestar requirements).	Shower, toilet and taps WEL rated (to Homestar requirements).	
	Rainwater storage	N/A	Consideration to be given to including in design.	Consideration to be given to including in design.	Sufficient storage for resilience requirements.	
	Stormwater attenuation	N/A	Depends on Council requirements.	If not required, consideration to be given to including in design.	If not required, consideration to be given to including in design.	
	Water heating	G12/AS1	Electric hot water system.	Consideration to be given for a solar or heat pump driven hot water system.	Solar Hot water system or PV powered heat pump supplying hot water.	
	Greywater Recycling	N/A	N/A	N/A	N/A	Consideration be given to including in design.
	Water saving appliances	N/A	Consideration be given to including in design.	Consideration be given to including in design.	Consideration be given to including in design.	

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Waste	Recycling	N/A	Recycling of all construction waste where possible.	Waste minimalisation and management plan.	Waste minimalisation and management plan + targets.	
Energy	Target timeline	2004-2020	2020	2025	2030	
	Thermal Energy Demand Intensity (kWh/sqm*yr)	N/A	75	45	15	
Solar & Renewables	Active Solar	N/A	Consideration to be given to including in design.	Consideration to be given to including in design.	Sufficient storage to offset a proportion of energy costs.	
	Electric Vehicles	N/A	Consideration to be given to including a future allowance in the design.	Consideration to be given to including a future allowance in the design.	Make allowance or include EV charging point in the electrical design	
Sustainable Materials		N/A	Prioritises use of natural, non-toxic materials.	50% of materials are natural or non-toxic.	>75% of materials are natural or non-toxic.	
Modelling, Monitoring and Measurement	Design	N/A	Consider Energy Modelling.	Energy modelling to verify design assumptions.	Energy modelling to verify design assumptions.	
	Monitoring	N/A	Monitoring of IEQ for 12 months.	Monitoring of IEQ for minimum 12 months.	On-going monitoring of IEQ.	
	Validation	N/A	Review of IEQ data after monitoring period.	Review of IEQ data after monitoring period. Consider a further review after 24 months.	Review of IEQ data after 12 month monitoring period and on a 5 yearly basis.	
Commissioning		N/A	Commissioning check carried out as per the schedule.	Commissioning check carried out as per the schedule.	Commissioning check carried out as per the schedule.	
Landscape		N/A	Consider the opportunity for native planting and allow an area for vegetables to grow.	Consider the opportunity for native planting and allow an area for vegetables to grow.	Provide native species that promote biodiversity. Include vegetable growing area and fruit trees.	

1. All Houses need mechanical ventilation.
2. The above criteria represent the absolute bare minimum for what can be considered a baseline Healthy Home. The ideal is to measure performance, aiming for energy use and indoor environment quality targets set above. In lieu of a full year's worth of monitoring data, the above design standards can be considered an acceptable solution to meeting the baseline performance targets.
3. Standard 90mm framing is not the preferred option due to the reduction in insulation values shown in recent research. However it may be possible with care and attention to detail. This requires at a minimum following the full Base (Healthy Home) system recommended in this guide.

