ENTRANT GUIDELINES 2023

Design Matters National

true zero carbon challenge

01. CONTENTS.

SPONSORS AND PARTNERS

EPiC Database

FirstRate5® house energy rating software

Energy Inspection

Sustainability Victoria

VICTORIA State Government

B.E.R.S

HERO

AccuRate Home

02.
TRUE ZERO CARBON CHALLENGE

The aim of the competition is to design a home that not only produces more power than it uses over the year through energy-efficient design, careful appliance selection and photovoltaic integration, but to consider and calculate embodied carbon in material selection and put on enough extra photovoltaic panels to pay back the home's entire carbon debt by 2050 (based on today's carbon intensity).*

We call this the True Zero Carbon Challenge!

This challenge will not only furnish entrants with the necessary skills to thrive in the coming decades but will pave the way in showing the industry a roadmap to true Net Zero housing.

At this juncture, when the industry is arguing the benefits of moving to a 7 star Whole of House standard, this competition will be a pivotal beacon to show what is possible and that Design Matters members are ready, willing and able to meet the challenges of the low carbon future.

03.

BENEFITS OF ENTERING.

RECOGNITION

These awards are designed show off the skills of Australia's most progressive designers and energy efficiency assessors. The awards recognise building designers and energy efficiency assessors with the knowledge, passion and ability to design the homes we need for a low-carbon future. Meeting the Zero Carbon Challenge will give third-party endorsement for your business and a sign of professional quality for your clients, differentiating your company from the competition.

EDUCATION

Most importantly, all entrants will receive free training in True Zero Carbon Design (6 technical CPD points), which will not only give them the skills to meet the performance criteria but help their businesses flourish in the coming decades as we move towards a Net Zero Built Environment.

CERTIFICATION

All entrants who meet the True Zero Carbon Challenge will be rewarded with a digital logo they can use on their websites and marketing materials to show they have the skills and know-how to create the homes of the future, today.

PRIZE MONEY

The Awards will let the world know who Australia's best building designers and energy efficiency assessors are. The overall winning team will also be rewarded with $5000 in prize money, and the prestigious title of National True Zero Carbon Challenge Design winner.

MARKETING

Entering the True Zero Carbon Challenge is an inexpensive way of getting nation-wide PR and marketing, with entrants to be featured across DMN's social media platforms, website and publications.

04. IN COLLABORATION.

Design Matters National is proud to present the 2023 challenge in collaboration with the University of Melbourne, Sustainability Victoria, Energy Inspection and HERO.

UNIVERSITY OF MELBOURNE AND EPIC DATABASE

The Environmental Performance in Construction (EPiC) Database was developed at The University of Melbourne and contains embodied energy, water and emissions coefficients for over 300 products. The coefficients are compiled using a technique that uses the best available manufacturing data, filling data gaps with national-economic and environmental data. This approach ensures complete coverage of the energy, water or emissions associated with a product's production, thus maximising comparability between products. The EPiC data can be used to assess whole building performance quickly and easily or select alternative materials. Due to the high level of transparency of the data, it can also be used to identify energy, water and emissions hot spots throughout the product supply chain.

SUSTAINABILITY VICTORIA

Sustainability Victoria's powerful FirstRate5 Whole-of-Home Pilot Tool will not only allow entrants to assess the impacts of passive solar design and energy-efficient appliance selection on overall energy performance but will also quantify the carbon offsetting of photovoltaic power contributions to the grid. This allows entrants to determine how carbon positive the homes they design are, in operation.

It is this feature, combined with a further calculation of upfront carbon by the entrant, that will allow the number of years required to 'pay back' the embodied carbon, to be determined. We see this as an opportunity for Design Matters National True Zero Carbon Challenge entrants to learn to work with the new tool and show how it can be used to move toward Australia's low carbon future agenda.

04. IN COLLABORATION.

ENERGY INSPECTION

Energy Inspection is happy to support the 2023 DMN True Zero Carbon Challenge where BERS Pro 5 can be used to calculate the thermal and whole-of-home requirements of the competition.

BERS Pro 5 provides flexibility and efficiency and is used by thermal energy assessors all over Australia and has been energy modelling software trusted by the industry for over a year.

The whole-of-home new calculation tool will allow entrants to work out the impact of different artificial heating and cooling systems, hot water systems and lighting loads for their design, while being able to add different configurations of photovoltaics to discover what it will take to fully offset carbon emissions for their design and achieve True Zero Carbon.

HERO

It's an exciting time in the residential, sustainable-building-design industry, with the introduction of increased NatHERS thermal-fabric star ratings and Whole of Home assessments. With these changes the industry will now be engaging in more holistic sustainable design, consulting across not only thermal-fabric but HVAC, hot-water systems, solar PV systems and the like, that will help their customers achieve low-energy, low-carbon buildings.

Hero Software are at the forefront of helping the industry deliver low-carbon design services in a timely, professional and efficient manner using Hero — our NatHERS accredited Building Energy Modelling software platform. We're looking forward to bringing our Whole of Home update into Hero in the second quarter of 2023.

The True Zero Carbon Challenge by Design Matters National is a great competition to promote consideration of 'what's next' and where leading-edge sustainable design needs to evolve now that our minimum benchmarks have been increased. We're proud for Hero and our users to be participants in the program.

05. TO PARTICIPATE.

Entrants will have the benefit of attending the following competition upskilling webinars that will equip them with the mindset and skill set to design the homes of the future:

- Net Zero Carbon & Designing for High Performance Homes
- Whole of House - Integrating efficient technologies to reach Net Zero
- Beyond Net Zero to True Zero Carbon - Including Embodied Carbon to achieve True Zero Carbon Challenge
- Live Optimising Design to Meet 7 Star Minimum
- Live Sustainability Victoria Spreadsheet tutorial
- Live Introduction to the EPiC Database
- Live EPiC Spreadsheet Calculator Training
- Live Whole of Home Training in either FirstRate5, BersPro, HERO or AccuRate Home (please email v.marshall@designmatters.org.au regarding AccuRate Home Whole of Home Training)

The Challenge webinars will attract 6 NatHERS technical CPD points and will be available from May.

THE CHALLENGE TEAM

Building Designers will need to team up with accredited Energy Efficiency Assessors, using the NCC 2022 NatHERS Software, and attend the competition webinars.

The aim of the challenge is to encourage bringing the accredited energy efficiency assessor into the design team early in the planning phase.

By doing so, thermal performance and energy efficiency principles inform dwelling designs that easily and affordably meet the increasing energy efficiency

06. DESIGN BRIEF.

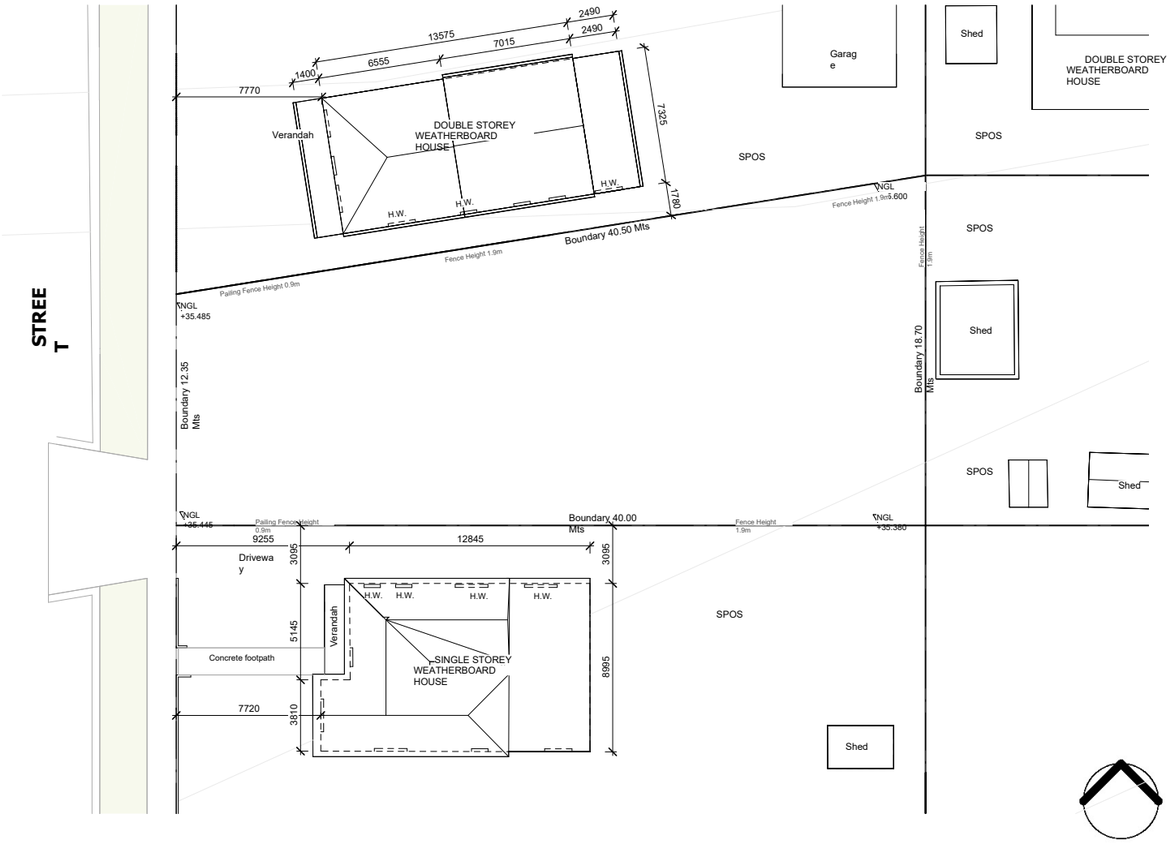
THE DESIGN BRIEF

- Design a Custom 3 bed + study family home to suit the site plan provided.
- Design for a suburban block from the list of Australian Climate Zones listed below.
- Your clients are a family of 4 members (The Family). The Family has strong environmental values and has advised that they want a functional home that will meet the current and future livability requirements of the family.
- In addition, the clients would like to allow for living space for Grandparents who visit regularly and may move into the home as they become less mobile in years to come.
- One parent works 4 kilometers away. The other parent currently works from home, offering online consultations, sometimes out of regular business hours. It is essential that the work space can be separated from the rest of the house when necessary.
- Both children ride bikes to their school located 2.5 kilometers from home.
- The Family likes to spend time in the garden with their 4 legged pet.
- The Family enjoys camping holidays, and has camping equipment which ideally can be stored in an easy to access manner.
- They have an electric vehicle as their family car.
- Future proofing the home for potential intergenerational living is important
- They also have strong values around growing their own food and spending time in their garden/ yard.
- The budget limit is $700,000
- Minimum House Energy Rating: 7 stars (in line with draft NCC 2022 provisions)

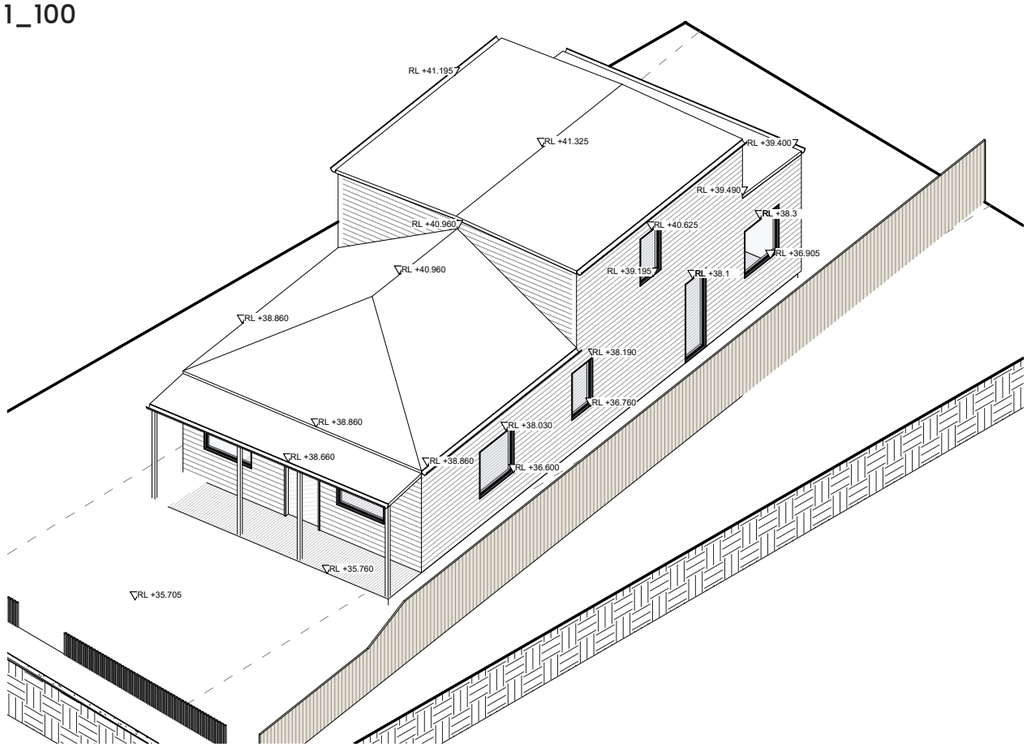
Entrants will need to:

1. **Create a design and Calculate operational energy use, with the NatHERS software Whole of Home tools.**
2. **Calculate embodied (Up Front) carbon in the structure with the EPiC Spreadsheet tool.**
3. **Then enter data into the SV Spreadsheet tool**
4. **Put on enough photovoltaic panels to have a Net Zero operational energy account on a yearly basis, and offset the embodied carbon in the structure by 2050.**

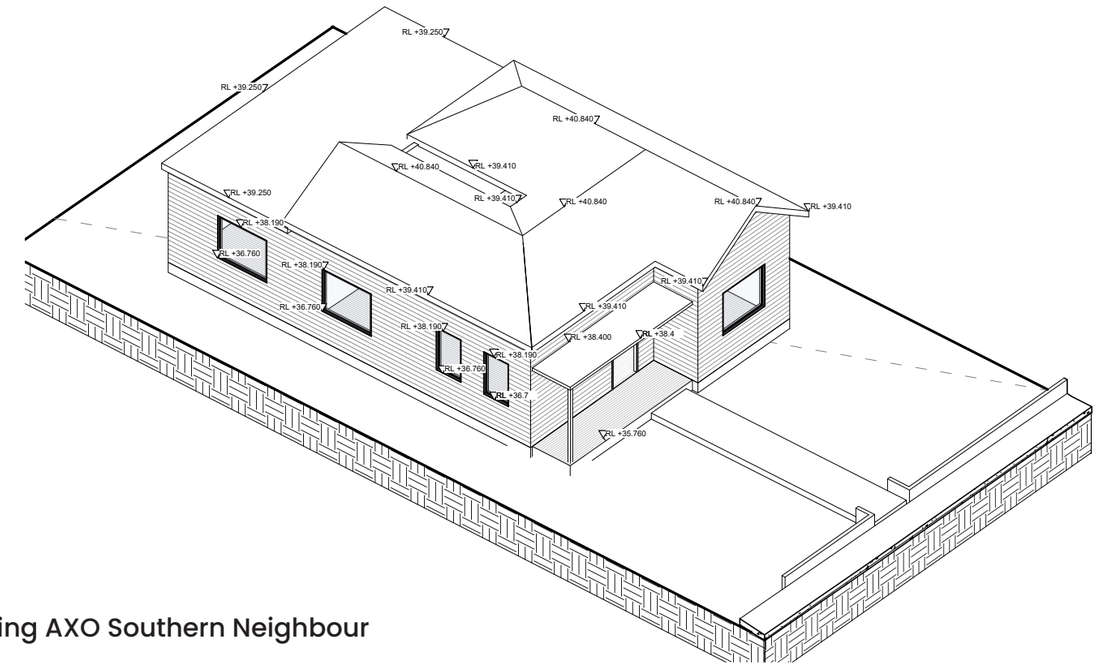
(Note, an export cap for the competition is a 5kW panel system per phase 3 phase = 15kW)



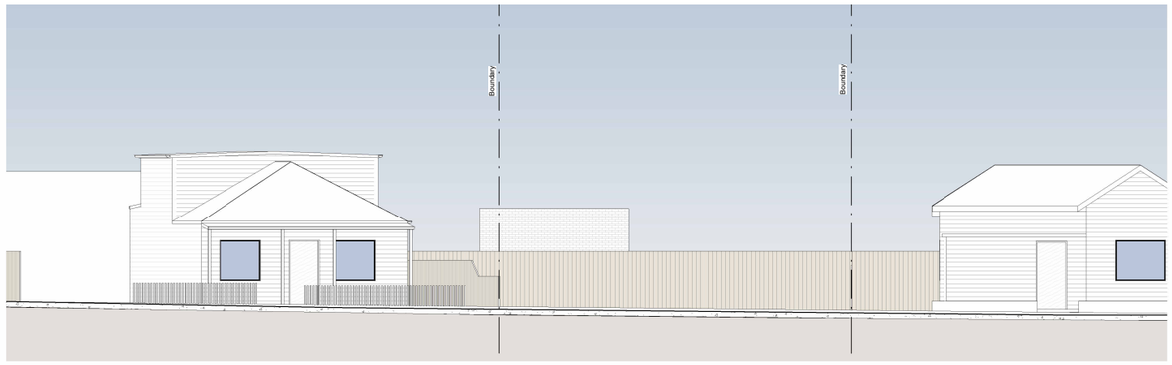
Existing Site Plan
scale: 1_100



Existing AXO Northern Neighbour



Existing AXO Southern Neighbour



Street Elevation
scale: 1_100

DESIGN FOR A SUBURBAN BLOCK IN ANY OF THE CLIMATE ZONES LISTED BELOW THAT YOU CHOOSE

- **Australian Capital Territory** - 17 All Stars Way, Macnamara 2615 - climate zone 24
- **New South Wales** – 12 Zero Carbon Street, Stanhope Gardens 2786 - climate zone 28
- **Northern Territory** – 34 Energy Efficient Avenue, Northcrest 0828 - climate zone 1
- **Queensland** – 56 Solar Passive Boulevard, Ormeau Ridge 4208 - climate zone 10
- **South Australia** – 78 True North Lane, West Lakes 5021 - climate zone 16
- **Tasmania** – 9 Southern Winds Circuit, Spring Bay 7190 – climate zone 26
- **Victoria** – 10 Thermal Performance Street, Mambourin 3024 - climate zone 60
- **Western Australia** – 11 Orientation Way, Landsdale 6065 – climate zone 13

Note: The above addresses are fictional and are not searchable on Google Earth or similar.

07. STEPS FOR CHALLENGE ENTRANTS TO TAKE.

START HERE

- Thoroughly read this document
- Work out your Challenge Team
- Complete the online entry form
- Pay Entry Fee

STARTING YOUR ENTRY

- Watch the three recorded plus the three live training videos for the Challenge
- Attend the free live Whole of Home Tool training webinars in either FirstRate5, BERSPro, HERO or AccuRate Home
- Attend the free live EPiC Spreadsheet Calculator webinar training
- Start collaborating with your team partner on building design

THE CALCULATION

- Calculate embodied (Up Front) carbon in the structure with the EPiC spreadsheet Calculator.
- Model Thermal Performance and Whole of Home design in NatHERS software.
- Enter operational energy data from the NatHERS tool together with photovoltaic panels into Sustainability Victoria carbon payback calculator spreadsheet.
- Add enough photovoltaic panels to have a Net Zero operational energy account on a yearly basis, and offset the embodied carbon in the structure by 2050.

(Note, an export cap for the competition is a 5kW panel system per phase 3 phase = 15kW)

All relevant webinars, documents and resources will be provided upon entering the competition.

08. SUBMISSION REQUIREMENT.

Plans (provided in one pdf document)

1. **site/landscape plan**
2. **floorplan**
3. **elevations**
4. **sections**
5. **renders/3D/Hero Images**

   Anything else useful to demonstrate concept eg: Fly through/animation as an MP4 file.

- **NatHERS Energy Assessment Report (7 Stars Minimum requirement plus Whole of Home) (submitted as a PDF)**
- **Environmental Product Specifications table (submitted as a PDF)**
- **The EPiC Spreadsheet Calculator Rating Report (submitted as an excel file)**
- **Embodied Carbon Payback time calculation (Sustainability Victoria Spreadsheet) (Submitted as an excel file)**
- **Upload all documentation to the folder provided**
- **Your answers to the Entrant's online questionnaire**

09. JUDGING CRITERIA.

The Challenge:

Does the home satisfy the brief and the 2050 challenge?

Consideration should be given to:

- What year does the house break even?
- If it doesn't meet the challenge, how close did the entry come?
- Are the numbers presented by the entrants realistic?

Sustainable Innovation:

Is the solution a sustainable one?

Consideration should be given to:

- Have passive solar design principles for the climate zone been well used to maximise thermal performance?
- How well is the design predicted to perform thermally? What is its rating?
- Does design and material selection work together for low carbon outcomes?
- Is durability and maintenance over life considered?
- Has the end of life and circular economy thinking been considered?
- Are broader sustainability initiatives (beyond carbon) considered/included?
- Is it spatially efficient and adaptable?
- Is this a design that represents an exciting new direction in sustainability for our suburbs?

Materials:

Have entrants been able to justify material choices inserts?

Consideration should be given to:

- Embodied carbon
- Durability
- Low maintenance/replacement & therefore lower embodied carbon potential during the use phase
- Inclusion of recycled materials, or materials that are recyclable at end of life, or fit with broader circular economy goals
- Minimisation of Resource use
- Minimisation of Habitat loss
- Minimisation of pollution issues beyond CO2.

09. JUDGING CRITERIA.

Liveability:

Does the house allow families to evolve and thrive?

Consideration should be given to:

- Do the rooms and spaces interact well with each other?
- Have space and resources been efficiently used?
- Do spaces connect visually with the outdoors, and harmonise well with the yard?
- Is ventilation considered practical?
- Have low VOC and Indoor air quality been considered?
- Has landscaping been considered, and integrated into the design, and have sustainable initiatives been employed?
- Will the internal layout work well for family members as families age?
- Has accessibility been considered?
- Does the design support good health outcomes?

Does the design consider future resilience?

Desirability:

Will people want it?

Consideration should be given to:

- Is this a house to fall in love with?
- Does it involve creativity and ingenuity?
- Does it capture the zeitgeist of a future where the built environment is in harmony with the natural environment?
- Is it likely to be affordable (realistic to budget) and achievable?
- How well do practical functionality and beauty of the home meld?
- Is the design likely to make a difference to our approach in the way we design, build and live in our homes going forward?

10. SPECIAL AWARDS.

Design of the Year for each Climate Zone

National True Zero Carbon Design of the Year

Best use of organic materials

Building Designer Student Award

Energy Efficiency Assessor Student Award

PRIZES

All entrants who meet the challenge brief will receive the following:

- An award to show they have been able to meet the True Zero Carbon Challenge.
- Digital certificate and assets citing TrueZero Carbon Designer for online recognition.
- Climate Zone winners will qualify for National Award.
- The National True Zero Carbon Design winner will receive $5,000.

Design Matters National | true zero carbon challenge

Good Luck

WE WISH YOU EVERY SUCCESS WITH YOUR SUBMISSION

For any questions please contact

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