ovens & king builders
unique and individual

Nam Shing Lane Certified Passive House

This project was designed to meet the clients needs at a later stage of life. They downsized from a larger property with high maintenance, choosing a smaller block in a central area of Beechworth specifically to improve day to day access to services and shops and reduce the demands for gardening and upkeep.

Our clients are energetic and engaged in their community and wanted to provide an example to others about how housing can be energy efficient without compromising design possibilities or the level of finish internally.

After Ovens and King Builders were provided an architectural concept , we set about completing the construction plans with the requisite detailing to achieve the rigorous Passive House Standard of construction.

The intent was to deliver a new home of the highest performance and finish possible, creating a model of sustainable and energy efficient construction of the highest order.

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Thermal Performance

Nam Shing is a project loaded with features, both functional and aesthetic.

- Nathers Star rating of 8.9 Stars is only the first measure of a home with exceptional performance
- International Passive House Association (IPHA) Certified Passive House

Certified Passive House; Now registered with the International Passive House Association, IPHA Database ID: 6509, this house meets the highest standards of energy efficient construction at an international level. Passive House is a fabric-first construction standard summarised by 5 design principles and performance criteria;

- Thermal Insulation that provides effective thermal separation between the heated or cooled inside environment and the outdoors
- Triple Glazed Windows in frames that don't conduct energy in or out of the house to any great degree
- Heat Recovery Ventilation to bring a constant flow of fresh air into the relatively airtight environment, allowing for a good indoor air quality and saving energy
- Airtightness of the Building sealing against air leakage to increase comfort while reducing energy bills
- Absence of Thermal Bridges that conduct energy through the building fabric, ensuring there is no uncontrolled drain on thermal performance

To achieve this the building fabric is exceptional;

- Waffle pod slab on insulated base of 100mm PIR foam, constructed with a speciality concrete designed with off white cement, white pigments and local gravels for a polished finish
- Hand framed stud walls in H2 termite resistant Laminated Veneer Lumber (LVL) timber, sealed internally and externally with Pro Clima intelligent breather membranes for ait tightness
- External wall insulation of 100mm PIR foam, battened and fitted with Colorbond Enseam wall claddings
- Triple Glazed, aluminium /timber composite windows, certified for Passive House construction and imported from Poland by Logikhaus of Canberra. The thermal performance of these windows, minimising air movement and heat gain and loss is a key factor in the success of the building
- uPVC windows, triple glazed, for Wet areas, Colour matched to the other windows

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- R10 Ceiling insulation over the House ceiling, overlapping the wall insulation to create a continuous thermal envelope
- Zender Q350 heat recovery ventilation system delivering outstanding performance including efficient heat recovery (up to 96%), low noise generation and reduced power consumption.The HRV extracts the heat energy, which would have otherwise been lost through the normal exhaust processes, and transfers this to the fresh, filtered supply air which is drawn in from outside

Sustainability

Sustainability measures include:

- Compact design on a smaller lot, reducing impacts of materials manufacturing, energy consumption and land availability
- Water tank for collection of rainwater for garden needs
- Water: Not only is rainwater harvested but the circulating hot water ring main combined 4 star rated plumbing fittings reduce town water consumption
- Purpose built, insulated raised garden beds for vegetable gardens
- Grid connected 4 kw photo voltaic power supply system to minmise reliance on traditional power generation systems
- Energy saving LED lighting high performance refrigerator and water saving front loading washing machine
- Landscaping providing pathways with significant permeable areas adjacent
- Sanden Heat pump Hot water service with a recirculating ring main for hot water efficiency. The Sanden Heat pump uses only 20% of the energy required by a conventional electric storage hot water system and delivers up to 50% faster heat recovery than currently available hot water heat pumps. The Sanden Hot Water Heat Pump System consumes 0.84kW^^ of electricity to generate 4.99kW^^ of heat
- Construction Waste minimisation with on-site diversion of wood, paper and steel waste for recycling to minimise landfill

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Architectural features

- Lysaght ‘Enseam’ wall claddings in Colorbond Matt and Metallic finishes
- Integrated external blinds, remote controlled from inside
- Custom made gate to Main Entry and Carport for security, designed to complement the existing building lines
- Original Artwork installations to the building fabric and surrounds
- European Oak window frames internally
- Custom Cabinetry featuring Oak cabinets and composite stone Benchtops
- Polished concrete floor throughout constructed with a speacialty concrete designed with off white cement, white pigments and local gravels for a polished finish
- Flush finish skirtings for a minimalist effect
- Ezy Jamb door fiinshes along with square set plaster junctions for the same minimalist effect
- LED lighting including directional downlights for highlighting effect
- External store room/Plant room with Roller door access

Cost Effectiveness

The context of cost effectiveness of a passive house has to be discussed in relation to the cost and performance of a ‘normal house’.

Energy consumption is so low in the Passive House that the occupants no longer have to worry about increasing energy prices. The house is likely to be practically independent of imported energy sources with its facility for renewable energy providing a sufficient offset to low consumption of electricity taken from the grid.

This means additional costs of construction that drive mortgage costs are balanced by the reduction of monthly outlays for utility costs. Once mortgage obligations are complete, the building’s owners continue to profit from reduced energy costs because the inactive components of the Passive House continue to function as long as the house stands.

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There are even more benefits: there is always fresh air and less indoor air pollution in the house than is the norm, there is no likelihood of mildewed walls, no cold draughts, no cold feet in the Passive House. Triple glazing reduces sound transmission from the outside very effectively.

The occupants can also profit from the reduced environmental impact. The consequences of climate change affect everyone; in Passive Houses, climate-damaging emissions are reduced by a factor of 4 when compared with 'normal' new buildings.

So when considering the project's M2 cost, it's important to consider what the building actually delivers.

Benefits to the home owner

Passive house presents very tangible and immediate benefits to the Home owner;

1. The temperature inside is always the same, Passive houses reduce heat losses in winter and prevent heat inputs in summer, establishing the ideal temperature throughout the house.
2. The temperature is comfortable in all parts of the house, the combination of insulation implanted in the home with the Heat recovery ventilation system allows all the rooms to have the same temperature and is also within the comfort parameters.
3. Passive House reduces your heating expense by more than 90%, the superior level of insulation combined with the latest window technologies mean it will not be necessary to produce almost any heating or cooling. The air conditioning and artificial ventilation that may be needed is produced with very efficient systems.
4. The passive solar orientation will adapt to the sun, to make the most of all the solar benefits and natural light, also avoiding summer overheating.
5. Reduces your CO2 emissions by more than 90%, minmising polluting emissions that cause climate change.
6. Great acoustic insulation from outside noise is provided by triple glazed windows with a double air chamber. This not only serves as thermal insulation but also makes outside noise virtually imperceptible.
7. The installation of a ventilation system produces a totally controlled air circulation, without currents or temperature changes, creating a pleasant sensation of comfort. The extracted air heats the new air in a very efficient way.

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8. Improvements in air quality; The filtered air avoids the presence of dust and pollen, which reduces the allergic reactions and the cleaning of the indoor dust. In addition, the low concentration of CO2 and volatile organic compounds reduces the feeling of fatigue and other ailments.
9. The additional construction costs of a new passive house is only 10-15% on the overall price of the work, in exchange for a lifetime energy saving, unparalleled thermal comfort and a drastic reduction of emissions throughout the life of the building.

Materials and Construction

All the materials chosen for the house reflect the overall quality of the construction, both in a structural and an aesthetic sense;

- Speciality concrete designed with off white cement, white pigments and local gravels for a polished finish
- Underslab insulation using load bearing 100mm PIR foam
- H2 termite resistant Laminated Veneer Lumber (LVL) timber for wall frames, H2 treated plantation grown pine for roof trussers
- Pro Clima intelligent breather membranes for ait tightness: Intello for an internal membrane, Extasana for a weathertight membrane, all sealed with Extora tape
- External wall insulation of 100mm PIR foam,
- Triple Glazed, aluminium /timber composite windows, certified for Passive House construction and imported from Poland by Logikhaus of Canberra. Powder coated external frames and European oak internal finishes. European hardware for tilt and turn function. Lift and Slide doors for air tightness
- R10 Ceiling insulation over the House ceiling, overlapping the wall insulation to create a continuopus thermal envelope
- Zender Q350 heat recovery ventilation system delivering outstanding performance including efficient heat recovery (up to 96%), low noise generation and reduced power consumption
- Rainwater tank made from Galvanised Aquaplate coorugated iron for longevity
- Purpose built, insulated raised garden beds made from Coretne steel

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- Grid connected 4 kw photo voltaic power supply system to minmise reliance on traditional power generation systems
- Energy saving LED lighting, high performance refrigerator and water saving front loading washing machine
- Landscaping providing pathways with significant permeable areas adjacent
- Sanden Heat pump Hot water service with a recirculating ring main for hot water efficiency
- Lysaght ‘Enseam’ wall claddings in Colorbond ‘Monument’ Matt and ‘Galactic’ Metallic finishes
- Logikhaus powder ocated, Integrated external blinds, remote controlled from inside
- Custom made, powder coated gate to Main Entry and Carport for security, designed to complement the exisitng building lines
- Original Artwork installations to the building fabric and surrounds
- Custon Cabinetry featuring Oak cabinets and composite stone Benchtops
- Flush finish skirtings for a minimalist effect
- Ezy Jamb door fiinshes along with square set plaster junctions for the same minimalist effect
- LED lighting including directional downlights for highlighting effect

Site Management

- Site fencing for safe access and restriction of the construction footprint
- Dedicated waste bins for general waste, scrap timber, scrap steel, paper and domestic type recyclables
- Allocated materials storage in fenced area adjacent to site, arranged and approved by the municipality
- Induction process that addressed potential impacts of traffic and noise on neighboring properties