



ANDERSON ENERGY EFFICIENCY CASE STUDY

ADVANCING SUSTAINABLE BUILDINGS ACROSS AUSTRALIA



THE "100%" GLAZING HOUSE

A Case Study

BY RAGHAV SHARMA

Energy efficiency may appear to be a straight forward process; however there are times when one comes across a project that presents a healthy challenge, for even the most experienced professionals.

This case study describes the journey of a client on one such project. To begin their journey, the client contacted us to undertake the energy efficiency assessment for their residential dwelling.

Anderson Energy Efficiency provided energy efficiency assessment and consulting for this "high glazing" project, including the issuing of From 15 and Universal certificate (mandatory) required for Building Approval.

The assessment was carried out using the NatHERS Star Rating method, which allowed us to observe how the proposed building elements impact the thermal performance of the house. This impact is measured by what is known as a NatHERS Star Rating.

Project Summary

Location:

Gold Coast,
Queensland

Project Type:

Residential, Single
Dwelling (Class 1)

Engineer:

Dr. Sherif Zedan

For more details check:

<https://andersonenergy.com.au/about-us/>

Assessment method:

NatHERS Star Rating



About the Project

The project included a single dwelling within the Council of the City of Gold Coast (Climate Zone 2). The house was a single storey residence, with a mezzanine level. Most of the building façade composed of glass (double glazing to be precise).



The proposed design was modelled in a NatHERS approved Energy Modelling Software. The Star Rating output correlates to the amount of heating and cooling energy required for Thermal comfort during the year. The higher the star rating of a house, the less heating and cooling energy is required to maintain thermal comfort. For the initial simulation, the resulting Star Rating was close to 0 Stars, indicating that the building will require an extensive amount energy to maintain thermal comfort within the building.

Design Goals and Challenges

CLIENT'S DESIGN GOALS, CHALLENGES AND OUR GUIDANCE

Here's a quick run-down of the design goals the client wanted to achieve:

- Achieve a 6 star rating for the house (without use of credits such as solar panels, complying outdoor living area etc.)
- They did not wish to change or reduce the amount of glazing in the building's external façade.
- To use the proposed glazing (double glazed, with high SHGC value)

Project Challenges

Challenge #1: Extensive Glass Façade

As mentioned earlier, around 90% of the external building façade composed of glass (double glazed). Since glass has a very low R value, it does not present a high resistance to conductive heat flow, for the conditioned space. Furthermore, most importantly, it was not possible to add insulation or any other layers to the façade in order to increase the overall façade R value (if needed)

Challenge #2: High SHGC value glazing

Despite being double glazed, the Solar Heat Gain Co-efficient value of the glazing product was high. This meant that large amounts of solar heat was being radiated into the building from each orientation. Hence large amounts of cooling energy was required in order to maintain thermal comfort.

Our Guidance and Recommendations

Challenge #1

Since the client did not wish to reduce the amount of glazing in the building façade, a couple of suggestions were presented to the client:

- Suggestion 1 (Extending Roof Soffit): It was suggested that by extending the length(s) of the roof soffit, the amount of shading can be increased over the glass façade.
- Suggestion 2 (Adding Louvres): It was suggested that the amount of heat from the sun may be reduced by adding louvres to some parts of the façade.

The client was happy with both suggestions, especially the second one as the client had already thought of adding louvres as an architectural feature, with the aim of enhancing building aesthetics. By incorporating the two suggestions, along with other minor adjustments to the model (change of floor coverings etc.), we were able to achieve a compliant solution. with an overall star rating of 5.1 (by applying the credit granted for solar panels). However, since the client wanted a 6 Star House, without any star credits, we had to tackle the second challenge subsequently.

Challenge #2

As mentioned previously, the original glazing product had a high SHGC value, which negatively impacted the Star Rating of the house. We searched and proposed a similar glazing type, with a lower SHGC value (reducing the amount of solar heat gain). Upon adding that to the model, we successfully achieved a Star Rating of 6.6, which was in line with the client's design goals.

In conclusion, a compliant and desirable building solution was achieved by the client. Despite the challenges encountered by the original design, the client successfully navigated through them by taking on board the guidance of the experienced Anderson Energy Efficiency team.

Getting the right guidance is crucial when you want to realise your vision. Let us show you how we can help.

If you'd like more information about how to improve the energy efficiency of your building, call us on: (07) 3240 5083 or email us at: info@andersonenergy.com.au