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Ecolibrium

Grand Slam

Can luxury and sustainability coexist?





Images by David Roche courtesy of the AIDA.

Grand Slam

The home of arts patron Judith Neilson, Indigo Slam in Sydney's Chippendale is a nexus of flowing concrete forms and robustness. ESD elements are prominent in the unique design, with a geexchange system providing heating and cooling. Ecolibrium editor **Matthew Dillon** broke bread with GeoExchange Australia managing director Yale Carden, M.AIRAH, about this fascinating project.

True, it has an unusual name: Indigo Slam (named after one of owner Judith Neilson's favourite crime novels). Yet an intriguing moniker may in fact be one of the least interesting things about the multi-award-winning abode based in the hip inner-city Sydney locale of Chippendale.

With its slanting concrete window shades – designed to admit maximum light but still allow for a comfortably cool interior, this slick house evokes (for me anyway),



a hairdryer component, a 1970s suburban office building, a Bond villain lair, and the flowing curvilinear designs of mid-century masters John Lautner and Oscar Niemeyer.

There is, however, sustainable substance to accompany Indigo Slam's singular style.

The true magnitude of the vision for the project rapidly became clear



The bold exterior includes "light shelves", which shade windows from direct heat-generating sunlight.



Indigo Slam was originally conceived as a place to display artwork, but is now considered a work of art itself.

In response to Neilson's request that the house be built to last 100 years, materials used are hard-wearing, and in some places mechanical components have been implemented in place of digital. For instance, hanging brass chains are used to open and retract oak-veneered blinds, and geared winders operate awning windows.

A high level of sustainability has been aspired to. Environmentally sustainable design elements include natural lighting, solar PV, cross-ventilation systems, rainwater harvesting, geexchange heating and cooling, and passive solar design – all of which combine to reduce energy and water load.

Ecolibrium: What was your brief for the project?

Yale Carden: Initially, a pretty simple brief – install the most comfortable, environmentally friendly and efficient system available. This quickly evolved into very specific requirements around acoustics and aesthetics such that nothing could be visible or heard.

As such, we had a very high level of involvement with the architect throughout the design and construction, and the true magnitude of the vision for the project rapidly became clear.



Drilling crew working within the confines of the former warehouse while Central Park Watches on. Image: GeoExchange Australia.

Eco: How did you execute this?

YC: A geoexchange system has three main elements. The one that is most different from conventional systems is the ground heat exchanger (GHX). In this instance, a vertical-borehole-style GHX was required due to space limitations.

The second element is the ground-source heat pump (GSHP). As the project had both hydronic/underfloor heating and ducted air conditioning, a

combination of a central water-to-water and distributed water-to-air GSHPs was adopted.

The third element is the distribution system, which is essentially identical to a conventional system.

Regarding execution, a Geoexchange system will always be the most efficient, so that element of the brief was simple.

Constant stable ground temperatures (19–20°C in Sydney) coupled to

high-efficiency ground-source heat pumps (GSHPs) will always be more efficient than air-sourced equipment. Gas heating was not an option due to fossil fuel combustion.

Further, because a geoexchange system does not require outdoor equipment, the client was able to utilise the entirety of the roof space for solar panels.

External aesthetics – the house has been compared to a sculpture – and acoustics (neighbours) also benefitted from the absence of outdoor equipment.

Installation of the boreholes was slightly complicated by the former warehouse site, as we had to coordinate with the construction program to install them after main demolition and prior to main construction.



Header pipes from the boreholes lead into the basement plantroom for future connection. Image: GeoExchange Australia.

“ Geoexchange is not only the main ESD element, it also complements others ”



Indigo Slam has earned a swag of awards for its architecture.



Though built as a residence for living in, the house is also designed to host events.

AWARD-WINNING

Indigo Slam has earned almost 20 state, national and international awards, including the 2016 Australian Institute of Architects Robin Boyd Award for Residential Architecture, and the Premier Award at the 2017 Australian Interior Design Awards (AIDA), which supplied the images used in this article.

With respect to distribution, a desire for optimal comfort and efficiency meant that an underfloor hydronic heating – and cooling, if they so choose – system providing warm toasty floors in the winter via a water-to-water GSHP, and ducted cooling and supplemental heating using the world’s most efficient heat pump were an obvious choice.

Eco: Does the geothermal system work in concert with other ESD elements?

YC: Geoexchange is not only the main ESD element, it also complements others. As noted prior, the lack of outdoor compressors enables nearly the entirety of the roof to be covered with PV panels. In addition to their obvious primary benefit of generating electricity, they also have a secondary benefit of reducing the building’s cooling load when the panels are elevated off the surface of the roof, as is done here.

The building’s façade is not only visually striking, but also works to incorporate the passive design element often referred to as “light shelves” that shade external windows from direct heat-generating sunlight while still reflecting daylight into the building’s interior.

Due to the complex design of the façade, the amount of cooling required from room-to-room will fluctuate significantly depending on the time of day, year, and level of sunlight.

As such, the geoexchange system has been designed such that nearly every room has its own individual temperature (and humidity) monitor and control, allowing it to effectively self-adjust to the home’s dynamic heating and cooling needs.

Eco: What did you most enjoy about working on the project?

YC: Seeing a vision come to life and witnessing a work of art slowly rise out of a dilapidated warehouse.

Eco: What did you find challenging?

YC: Balancing the artistic requirements of the design – remember, nothing visible or audible – with high-level comfort and efficient mechanical design in a constantly evolving project. It would have been easy to compromise on something that would have compromised efficiency or comfort later. Every design change required mechanical review to ensure that fine balance between art and comfort.

Eco: Did you learn any lessons?

YC: A lot of lessons in any project, so definitely no exception here. Primarily, the value of having a big vision and then developing a team to make it a reality. The power of balancing the big vision with the intricate detail.

Eco: Was there a sense you were working on something special?

YC: I still remember seeing the original drawings and physical models for the first time. They gave a sense of something special but also a sense of incredulity, a question of whether that façade, in particular, was even possible and what it would look like in reality. To the immense credit of all involved, it wasn’t long before the possibility was obvious and there was genuine enthusiasm to see it unfold. ■

INDIGO SLAM AT A GLANCE

The professionals

- **Architect:** Smart Design Studio
- **Builder:** Total Co-ordination
- **Geoexchange design:** GeoExchange Australia
- **Interior styling:** Rowena Moore

Ground-source heat pumps

- **Central water-to-water GSHP:** WaterFurnace NKW
- **Distributed water-to-air GSHP:** WaterFurnace 7 Series



Nearly every room has its own temperature and humidity monitor and control.