



LANDCORP

A GUIDE FOR THE PILBARA VERNACULAR DEMONSTRATION HOME

**INNOVATION
THROUGH
DEMONSTRATION**

MADIGAN
ESTATE

The image features a complex abstract design. It is composed of several large rectangular blocks in various shades of orange and black. A prominent feature is a large black square in the upper right quadrant, which is partially overlaid by a smaller orange square with a diagonal line pattern. Another orange square with a diagonal line pattern is located in the lower right quadrant. The background is a solid orange color. In the bottom left corner, the text "INNOVATION THROUGH DEMONSTRATION" is written in a bold, sans-serif font. The text is white and is positioned within a small black rectangular area.

**INNOVATION
THROUGH
DEMONSTRATION**

INTRODUCTION TO THE PROJECT

In 2012, LandCorp created the Pilbara Vernacular Handbook to better inform future Pilbara projects and guide development in the region. The Handbook has been designed to support people working within the Pilbara's land and property development industry, including urban designers, architects, builders, engineers and to support local government officers.

It brings together a collection of considerations and suggested strategies to help improve built form design outcomes in the region by:

- / Responding to climate
- / Incorporating the natural landscape
- / Building on the Pilbara character and identity
- / Encouraging change and innovation

MADIGAN ESTATE WAS SELECTED AS THE FIRST PROJECT TO DEMONSTRATE THE PILBARA VERNACULAR.

To that end we organised a Demonstration Home Design Competition to display the theory behind of the Pilbara Vernacular. The Design Competition provided an opportunity for the three invited architects and nominated builders to explore and showcase Pilbara Vernacular principles in a demonstration home. The primary objective of the exercise was to develop a concept design for a home, which contributes to the character and sense of place of Karratha while providing functional efficiency and comfort at a reasonable market price.



MADIGAN ESTATE

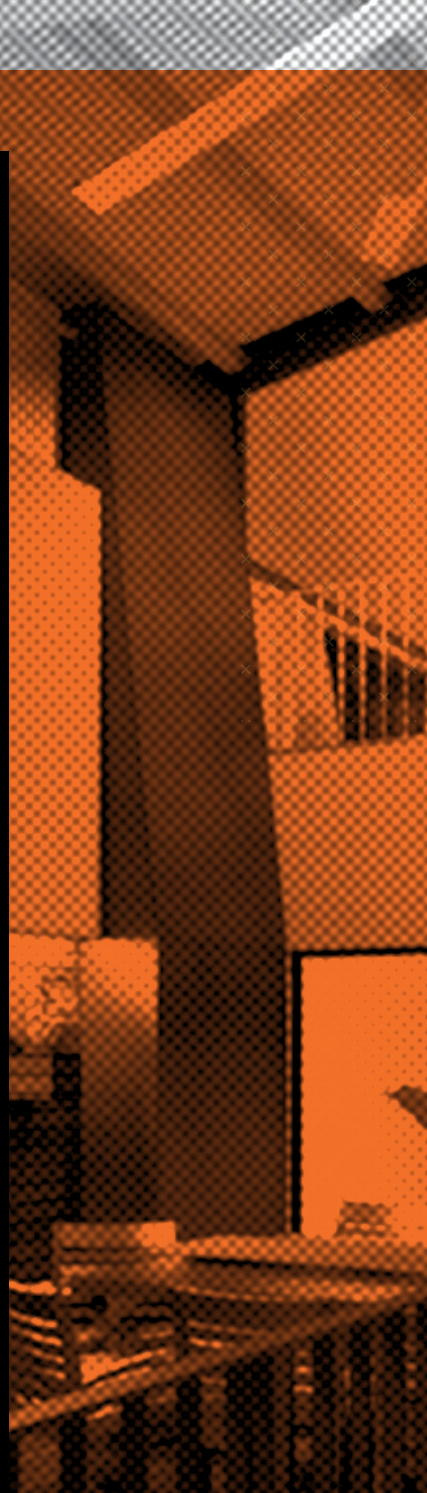
KARRATHA CENTRE

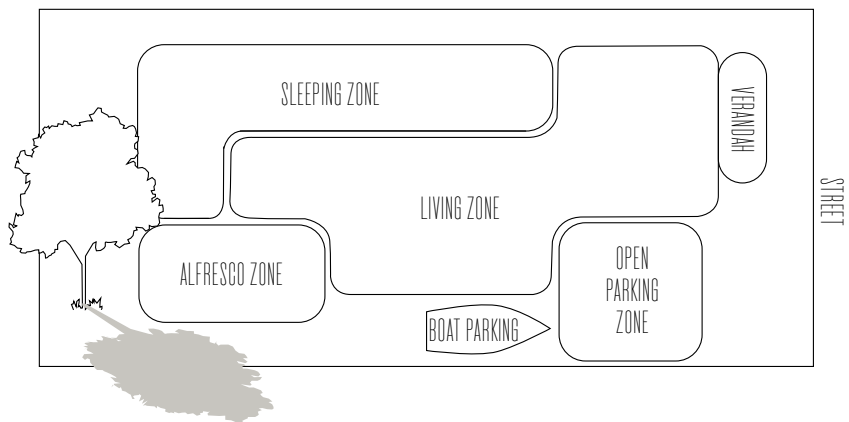
LOT 1 PRANCING AVENUE

A PANEL OF INDEPENDENT PROFESSIONALS, INCLUDING MEMBERS OF LANDCORP, THE OFFICE OF THE GOVERNMENT ARCHITECT AND THE AUSTRALIAN INSTITUTE OF ARCHITECTS AWARDED FIRST PLACE TO GRESLEY ABAS FOR ITS HOLISTIC APPROACH IN RESPONDING TO THE COMPETITION BRIEF.

The Gresley Abas Pilbara Vernacular Demonstration House was designed for the people of Karratha and the local conditions. By applying and interpreting the principles of the Pilbara Vernacular Handbook, the design seeks to strike a careful balance by responding to Karratha's climate, people, character, culture and future.

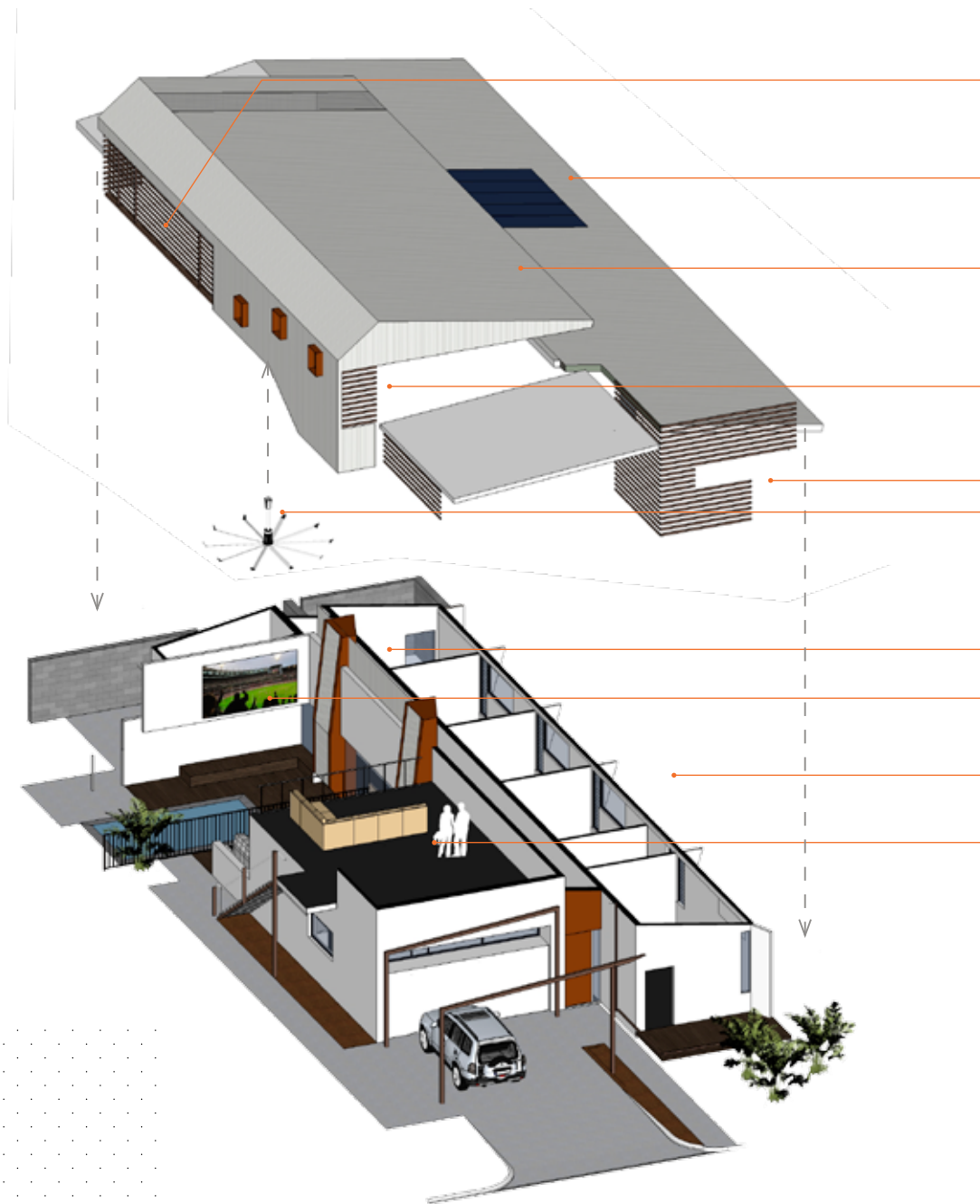
Gresley Abas teamed up with local builder Eaton Building to deliver this demonstration home and provide a glimpse into the future of residential design in the Pilbara.





Example plan from Madigan Estate Detailed Area Plan

RESPONDING TO THE PILBARA CLIMATE



Timber composite screening to outdoor living allows air movement whilst shading the southern summer sun angles

5kW solar photovoltaic system

Colorbond 'Coolmax' high reflectivity roof sheeting to all roofs. 'Parasol' roof offers secondary shading over insulated living areas

Timber composite screening to breezeway. The breezeway allows air movement around the house, minimising hot air pooling

Timber composite screening to master bedroom deck, screening the harsh morning summer sun

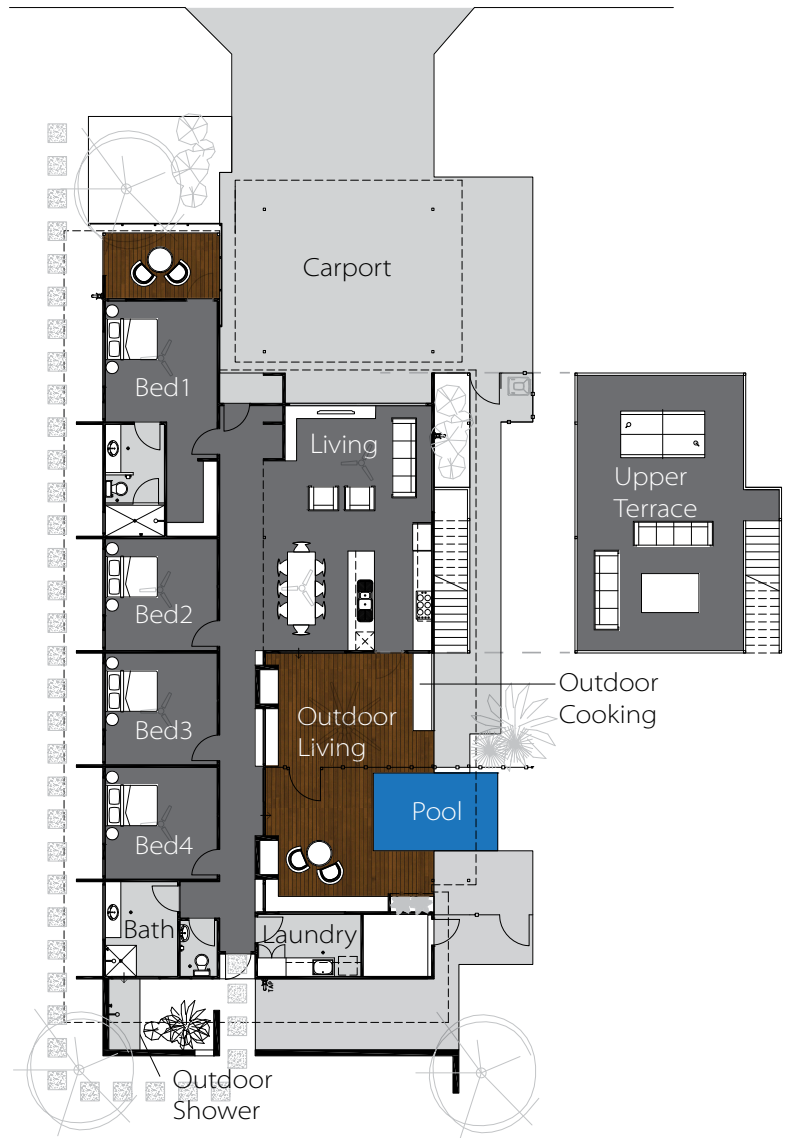
Low speed, high volume fan, providing an efficient and comfortable outdoor living environment

Wind scoops capture north and easterly breezes and delivers them to the outdoor living area using a simple pressure differential

Outdoor projection screen allows you to make the most of the cooler seasons, providing ample space to entertain

Wind blades direct cooling north easterly breezes into the bedrooms

Upper entertaining terrace, open to cooling breezes adds another layer of protection to the insulated living spaces below

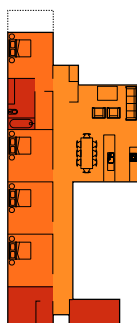


PLAN FEATURES

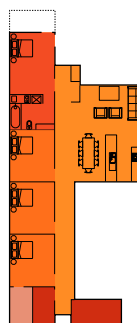
- / Large, sheltered outdoor area to the south of the house provides a comfortable alfresco living space in the cooler months.
- / A sheltered outdoor living area on the upper level provides a secondary shade device (parasol roof) to further reduce heat load on living areas and reduce energy costs associated with air conditioning.
- / Deep eaves shielded the sun from directly shining through the windows and protect the walls from heat gain.
- / Clear breezeway to the south of the outdoor area allows airflow around the house to promote air circulation and comfort.
- / Composite timber screening on the master bedroom to block harsh morning light and summer heat, provides a comfortable, semi-private and sheltered deck area to the street.
- / Composite screening to the southern outdoor area blocks the harsh summer sunlight from penetrating the living space, whilst allowing free air movement.
- / 'Wind scoops' bring cooling northeasterly breezes into the outdoor living space from the northern side of the house.
- / 'Wind blades' on the bedrooms on the northern façade, direct the breeze into the bedrooms in the cooler months.
- / Bedrooms oriented to the north, act as a heat barrier to main living spaces during the day, reducing the heat load on these areas.

ALTERNATE LAYOUTS

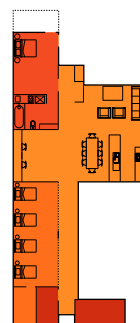
A simple lightweight construction method combined with an intelligent and simple planning approach allows for robust performance and flexible and adaptable arrangements of spaces that can change over time, easily and at low cost.



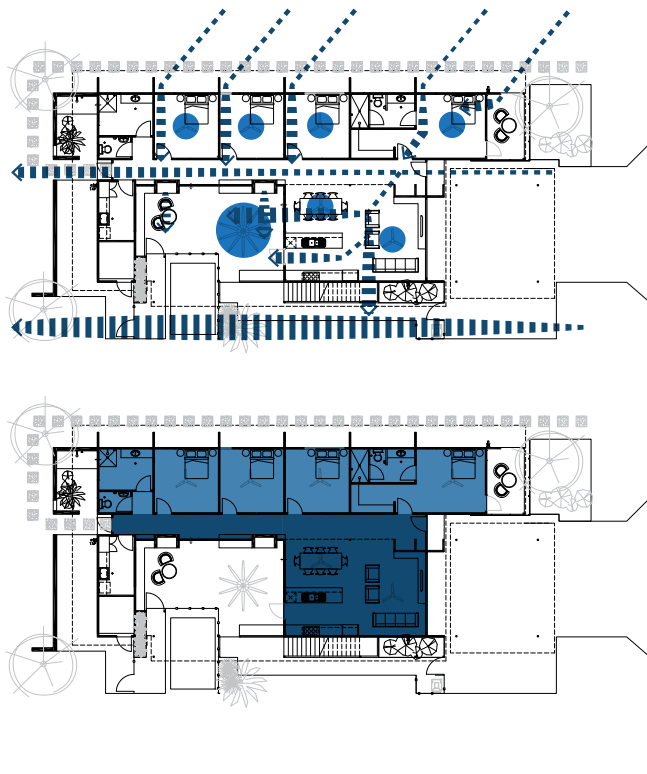
FAMILY



SHORT STAY



WORKER



CLIMATE

OUR HOME DESIGN IS BASED
ON A STRONG AND APPROPRIATE
RESPONSE TO LOCAL
CLIMATIC CONDITIONS.

Karratha's climate is not like Perth's, yet many homes in Karratha are based on Perth suburban models. This is highly problematic as many of the housing models in Perth are inappropriate for the local climate, let alone a semi-arid climate like Karratha.

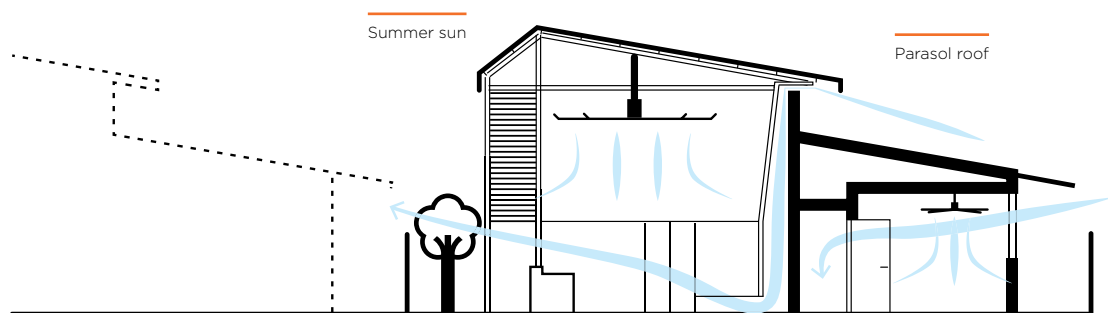
WINTER MODE

For the winter months, when the temperature is around 27 degrees, our home has been designed to promote excellent natural and passive ventilation through window and door openings. Using wind catching fins at narrow window openings, and maintaining a negative

pressure through an open side selection, the north and easterly cooling breezes are captured and will drive heat out of the house.

We have undertaken a comprehensive design process to ensure this home responds positively to the climatic

conditions. The spaces in this home have been arranged to keep the main living areas zoned off as a sealed 'esky' in the summer months, with the house able to be opened up to accept the cooling breezes during the mild winter.



SUMMER MODE

In the hot summer season, natural ventilation is not enough to provide suitable comfort levels to residents. The temperatures are just too hot. Using both insulated and shaded 'esky' like internal spaces we propose using a combination of high quality and efficient air conditioning systems which draw power from a 5kW solar

panel system. In implementing this, we have created an energy neutral solution and a highly comfortable environment. In summer, the use of air conditioning will keep residents comfortable, knowing that the PV panels are working hard to replace the energy being taken from the grid.

MATERIALS

Whitehaven

Pale Eucalypt

Cloudy
Sky

Mesa Red

Monument

Walnut

Brescia

Bayleaf

Pure Calcite

Charcoal

White wall

ROOF / COLORBOND COOLMAX

Highest index of reflectivity available

EXTERNAL WALLS / 75MM MASTERWALL

Cyclone rated and excellent insulation

EXTERNAL FEATURE

Your choice of front door and
air scoop colour

STEEL WORK AND BALLUSTRADES / COLOURBOND

Powdercoated steel

BLOCKWORK WALLS

External screens to the outdoor
shower and drying court

SCREENS

Rightwood secret-fix decking – brush finished low
maintenance and sustainable timber alternative

CABINET WORK / LAMINEX

Resilient and stylish finishes to all cupboards

KITCHEN BENCHES / LAMINEX

Pure Calcite

FLOOR TILES / EUPHORIA

Fully vitrified hardwearing
and easy to clean

WALL TILES / EUPHORIA

2,100mm height in all wet areas




INCLUDED SYSTEMS

- / Optimal shading / ventilation and other passive devices including treatment and delivery of outdoor areas
- / High COP / low noise air conditioning system
- / 30sqm, 5kW Solar PV system
- / Sealed doors and windows and no roof ventilation to optimise air conditioning requirements
- / High efficiency light fittings
- / High efficiency appliances
- / High levels of wall / ceiling and roof insulation (wool based batts / foil backed) best for climate
- / Mid-tone paving / aggregate to reduce heat sinking around home
- / High quality solar hot water system
- / Colorbond 'Coolmax' in lieu of standard Colorbond
- / Off-centre ceiling fans with 2.8m high ceilings
- / Top WELS rated fixtures and fittings
- / 75mm thick mulching in the garden to optimise water retention

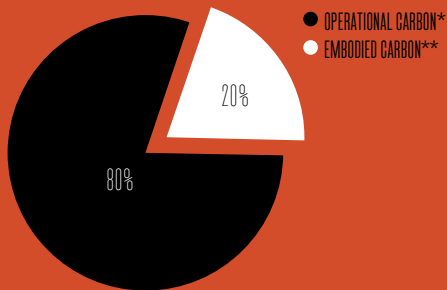
- / Low maintenance and water-wise plant selections
- / Sub-surface irrigation system to reduce evaporation
- / Capture condensate from air conditioning condenser unit and use for irrigation

OPTIONAL EXTRAS INCLUDED IN THIS DISPLAY HOME

- / External timber decking to outside living area
- / Pool
- / Built-in outdoor cinema package
- / Built-in outdoor kitchen
- / BBQ including outdoor fridge nook. Full integration into outdoor kitchen by using insulated cabinet to reduce energy usage
- / Timber deck to outdoor shower

	<p align="center">AccuRate V2.0.2.13 SP1</p> <p align="center">Nationwide House Energy Rating Scheme</p>								
<p align="center">Project Details</p>									
<p>Project Name: Landcorp Madigan Road Housing Competition</p>									
<p>File Name: \\vmware-host\Shared Folders\Dropbox\01 Projects\2013-17</p>									
<p>Gresley Abas GAA\NatHERS\03 AccuRate\GAA2M001.pro</p>									
<p>Postcode: 6714</p>		<p>Climate Zone: 2</p>							
<p>Design Option: Base Design</p>									
<p>Description:</p>									
<p align="center">Client Details</p>									
<p>Client Name:Gresley Abas Architects</p>									
<p>Phone:</p>	<p>Fax:</p>	<p>Email:</p>							
<p>Postal Address:</p>									
<p>Site Address:Lot 1 Karinha Way Baynton West</p>									
<p>Exposure:Open</p>									
<p>Council submitted to (if known by assessor):Shire of Roeburne</p>									
<p align="center">Assessor Details</p>									
<p>Assessor Name:Sid Thoo Architect</p>		<p>Assessor No.:70045</p>							
<p>Phone:08 6364 3775</p>	<p>Fax:08 6210 1758</p>	<p>Email:sid@architecture.net.au</p>							
<p>Assessment Date:4/07/2013</p>		<p>Time:6:02:</p>							
<p>Project Code:2013-17 GAA</p>									
<p>Assessor Signature:</p>									
<p align="center">CALCULATED ENERGY REQUIREMENTS*</p>									
<p align="center">Heating</p>	<p align="center">Cooling (sensible)</p>	<p align="center">Cooling (latent)</p>	<p align="center">Total Energy</p>	<p align="center">Units</p>					
<p align="center">0.0</p>	<p align="center">91.6</p>	<p align="center">46.3</p>	<p align="center">137.9</p>	<p align="center">MJ/m².annum</p>					
<p><small>* These energy requirements have been calculated using a standard set of occupant behaviours and so do not necessarily represent the usage pattern or lifestyle of the intended occupants. They should be used solely for the purposes of rating the building. They should not be used to infer actual energy consumption or running costs. The settings used for the simulation are shown in the building data report.</small></p>									
<p align="center">AREA-ADJUSTED ENERGY REQUIREMENTS</p>									
<p align="center">Heating</p>	<p align="center">Cooling (sensible)</p>	<p align="center">Cooling (latent)</p>	<p align="center">Total Energy</p>	<p align="center">Units</p>					
<p align="center">0.0</p>	<p align="center">85.0</p>	<p align="center">43.0</p>	<p align="center">128.0</p>	<p align="center">MJ/m².annum</p>					
<p align="center">Conditioned floor area</p>		<p align="center">129.4 m²</p>							
<p align="center">Star Rating</p>									
<p align="center">  8.1 STARS </p>									
<p align="center">Area-adjusted star band score thresholds</p>									
<p align="center">1 Star</p>	<p align="center">2 Stars</p>	<p align="center">3 Stars</p>	<p align="center">4 Stars</p>	<p align="center">5 Stars</p>	<p align="center">6 Stars</p>	<p align="center">7 Stars</p>	<p align="center">8 Stars</p>	<p align="center">9 Stars</p>	<p align="center">10 Stars</p>
<p align="center">569</p>	<p align="center">455</p>	<p align="center">373</p>	<p align="center">310</p>	<p align="center">260</p>	<p align="center">215</p>	<p align="center">172</p>	<p align="center">131</p>	<p align="center">93</p>	<p align="center">62</p>

During concept design, the design team used state-of-the-art environmental performance modelling to provide the best measure of how the house would perform in Karratha.



PERCENTAGE OF EMBODIED VERSUS
OPERATIONAL CARBON EMISSIONS

0.7

KILOGRAMS OF CARBON PER UNIT OF ELECTRICITY
CURRENTLY GENERATED BY DAMPIER POWER GRID

6,980

UNITS OF FREE ELECTRICITY GENERATED PER YEAR BY
INCLUDED 5KW SOLAR PV SYSTEM

65

YEARS OF DESIGN LIFE FOR DWELLING
(INCLUDING RECURRING MAINTENANCE)

397,690

KILOGRAMS OF CARBON OFFSET BY PROPOSED DESIGN RESULTING IN A
100% CARBON NEUTRAL OUTCOME

Source: eTool

The figures on this page reflect the concept design outcome. Live environmental measurements are being taken to test that the house lives up to the design. If this house is replicated, performance ratings may vary.

*Operational Carbon: total carbon emissions produced by the use of energy from the grid.

**Embodied Carbon: total carbon emissions produced by construction and building materials.

ARE YOU INTERESTED?

If you would like a house just like this in any location across the Pilbara, please contact:

Michael Marcello
Development Manager
9482 7886

Julio Navarrete
Design and Sustainability Manager
9482 7560

MORE INFORMATION CAN BE FOUND AT
LANDCORP.COM.AU/PILBARAVERNACULAR

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