COOLING STRATEGIES?

ABSA
Australian Building Sustainability Association

dhw

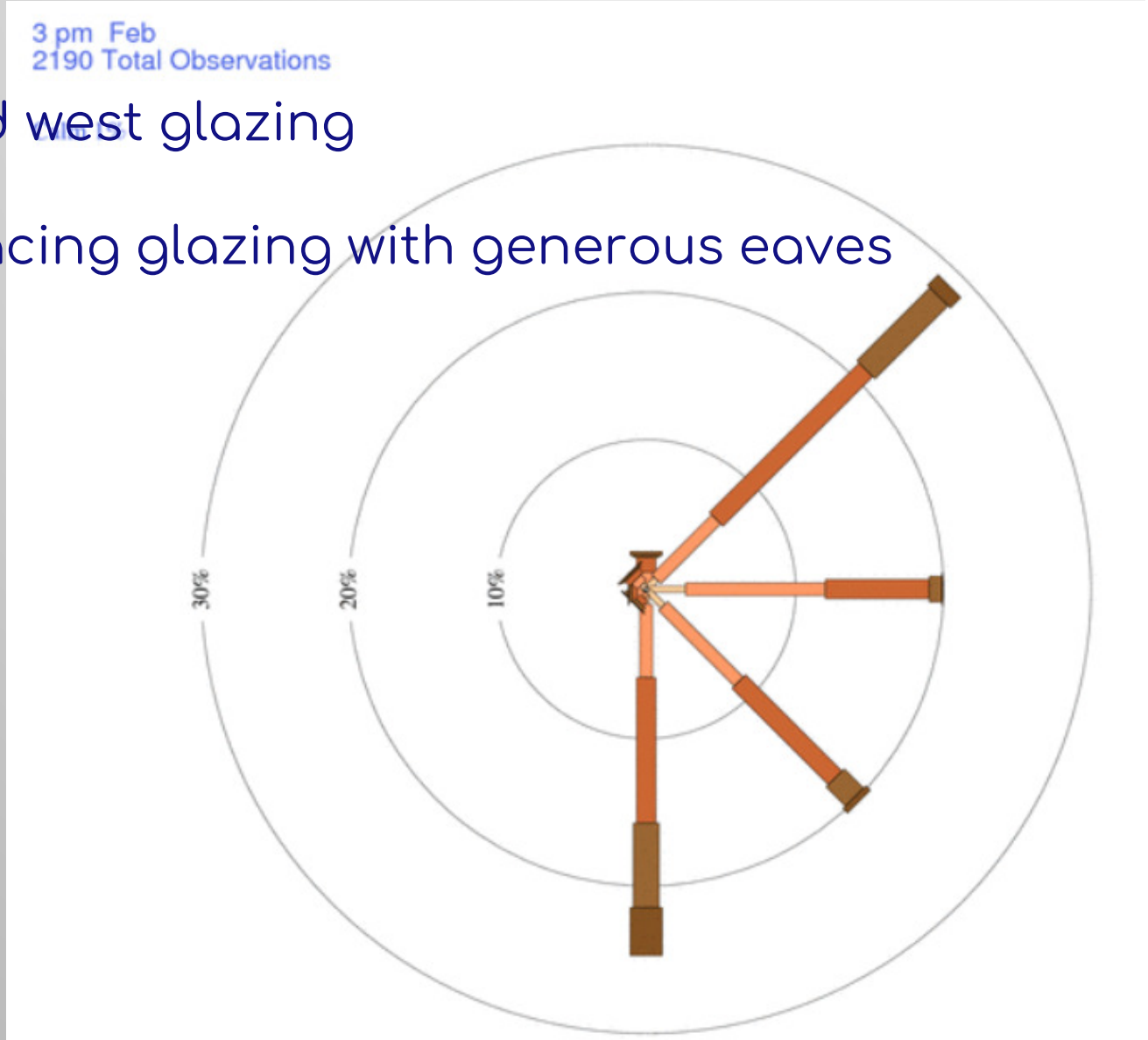
HOW TO DESIGN FOR COOLING

- ***Consider climate, site and location*** *– local breezes*
- ***Solar orientation and plan form*** *– efficient envelope*
- ***Glazing*** *– type, placement and size*
- ***Insulation*** *– optimum level*
- ***Thermal mass*** *– yes or no?*
- ***Ventilation***
- ***Shading***
- ***Colour***

Architect: SSD Studio
Builder – Australian Living

Site & Location

- Orientation
  - Minimise east and west glazing
  - Maximise north facing glazing with generous eaves
- Climate
  - local/micro
  - valley
- Topography

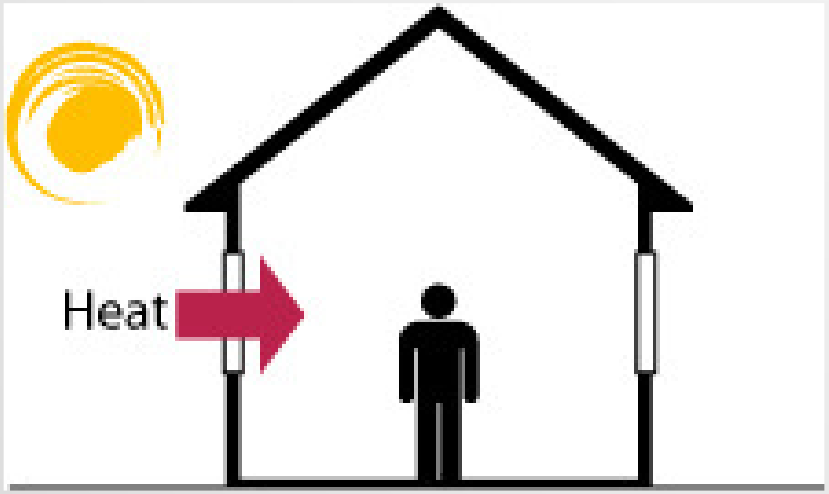


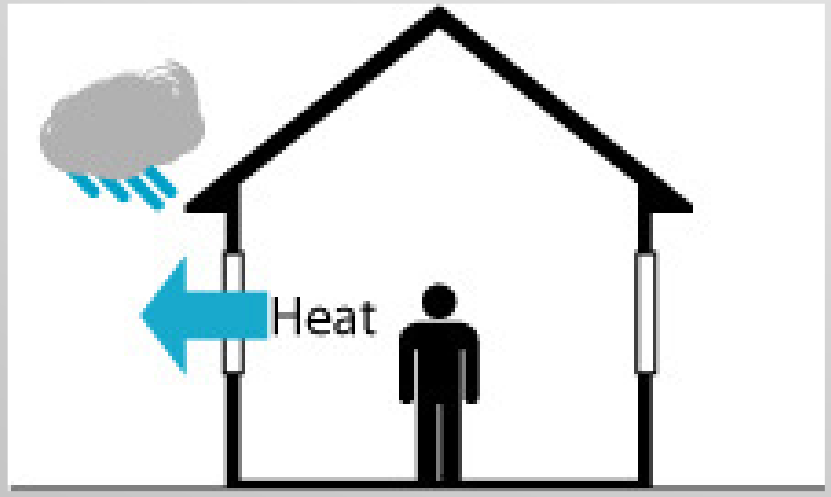
Plan & Form

- Efficient shape
- Minimal articulation
- Narrow for ventilation
- Optimise northern orientation
- Living/sleeping to north,
  services to south

Windows - Glazing

- Weak point in envelope
- Crucial for high performance
- Low E (low emissivity)
- Double glazing – all seasons
- U Value & SHGC value selection
- WERS rating https://www.awawers.net/en/ressearch





Source http://www.wers.net

Window Frames

- Aluminium – thermal break
- Steel
- Timber
- Composite
- UPVC
- Colour – avoid dark frames

Shading

- Eaves
- Verandahs
- Pergola
- Operable shading
- Screens/blinds
- Trees
- Planting

Source : Caroline Pidcock Architects

Insulation

- R-value maximise
- Bulk insulation
  polyester/wool/timber fibre
- Insulative materials
  - AAC, Straw-bale, Hemp
- Condensation Risk
  - Breathable materials
- Thermal Bridging

Thermal Mass

- acts as heat sink
- stabilises internal temperatures
- insulated from exterior
- Concrete slab
- Reverse brick veneer
- Internal brick/block wa
- Rammed earth
- Mud brick/clay floors
- Stone

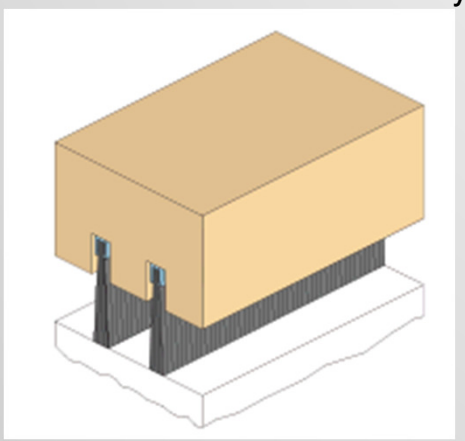
Ventilation

- Local breezes/height
- Plan form - narrow
- Opening location
  - opposite sides of room
  - breeze path
- Window type
  - casement, louvre
- Stack effect ventilation
- Night purging
- Ceiling fans

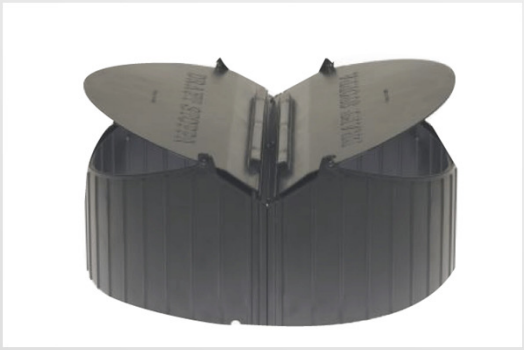
Infiltration

- NCC 3.12
- Avoid ceiling penetrations
- Avoid down lights
- Sealing doors/windows
- Exhaust fans
- Good lining junctions
- Skirting/architraves

efficiencymatrix.com.au



raven.com.au



draftstoppa.com.au/

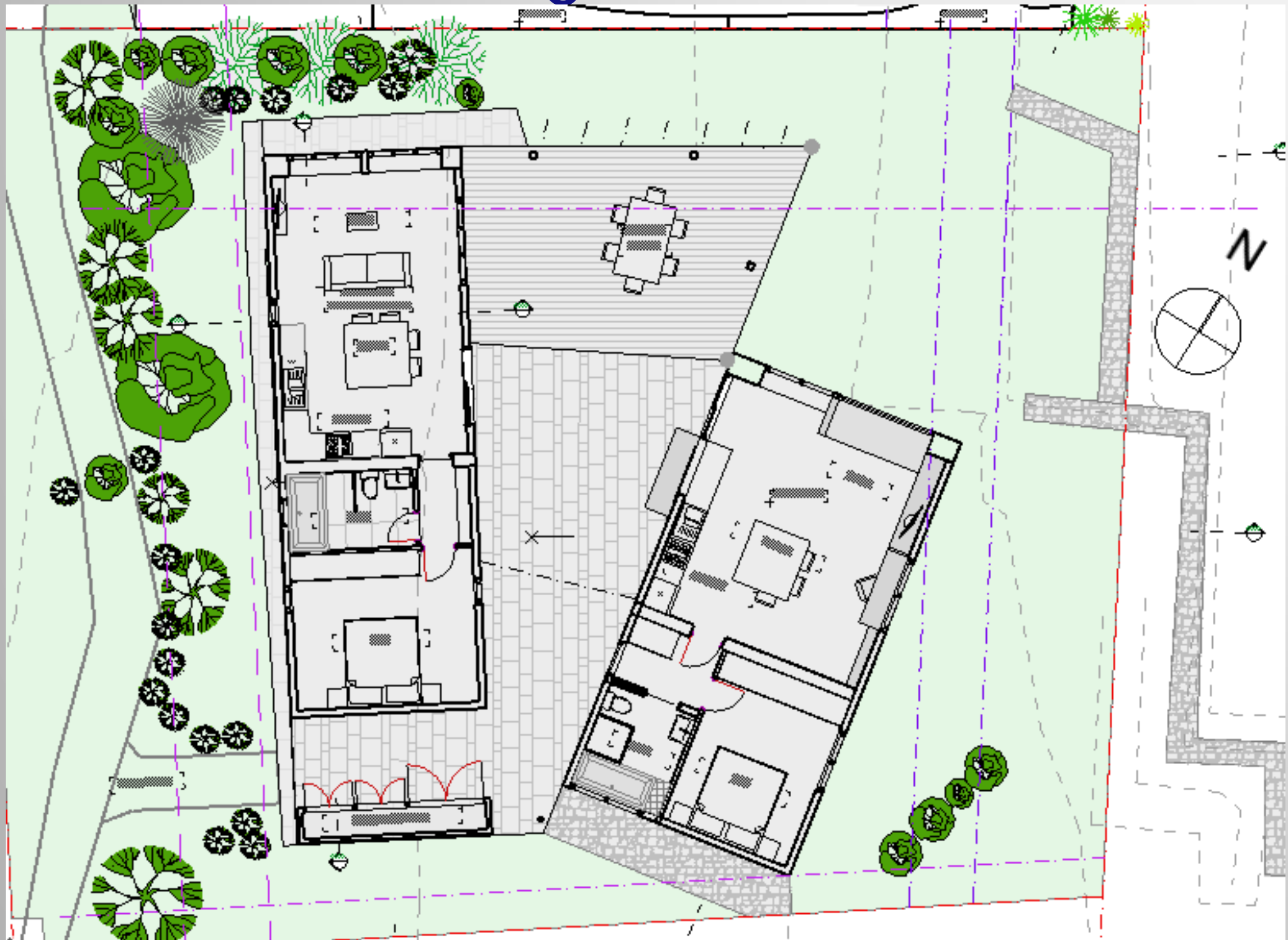
ezyjamb.com.au

8W LED replacement lamp for 50w halogen mini-downlight

Narara Ecovillage

- House – 8 star
- Granny Flat – 7.9 star
  - cooling 57% reduction
- Orientation – east for view
  `and breezes
- Thermal mass
  - Slab on ground
  - Some reverse brick
  - Internal brick walls
- Insulation
  - R2.5 walls
  - R4.0 roof
  - Breathable membranes
- Windows – UPVC Double glazed
- Shading – sunhoods, eaves, courtyard
- Colour –dark north, light east/west

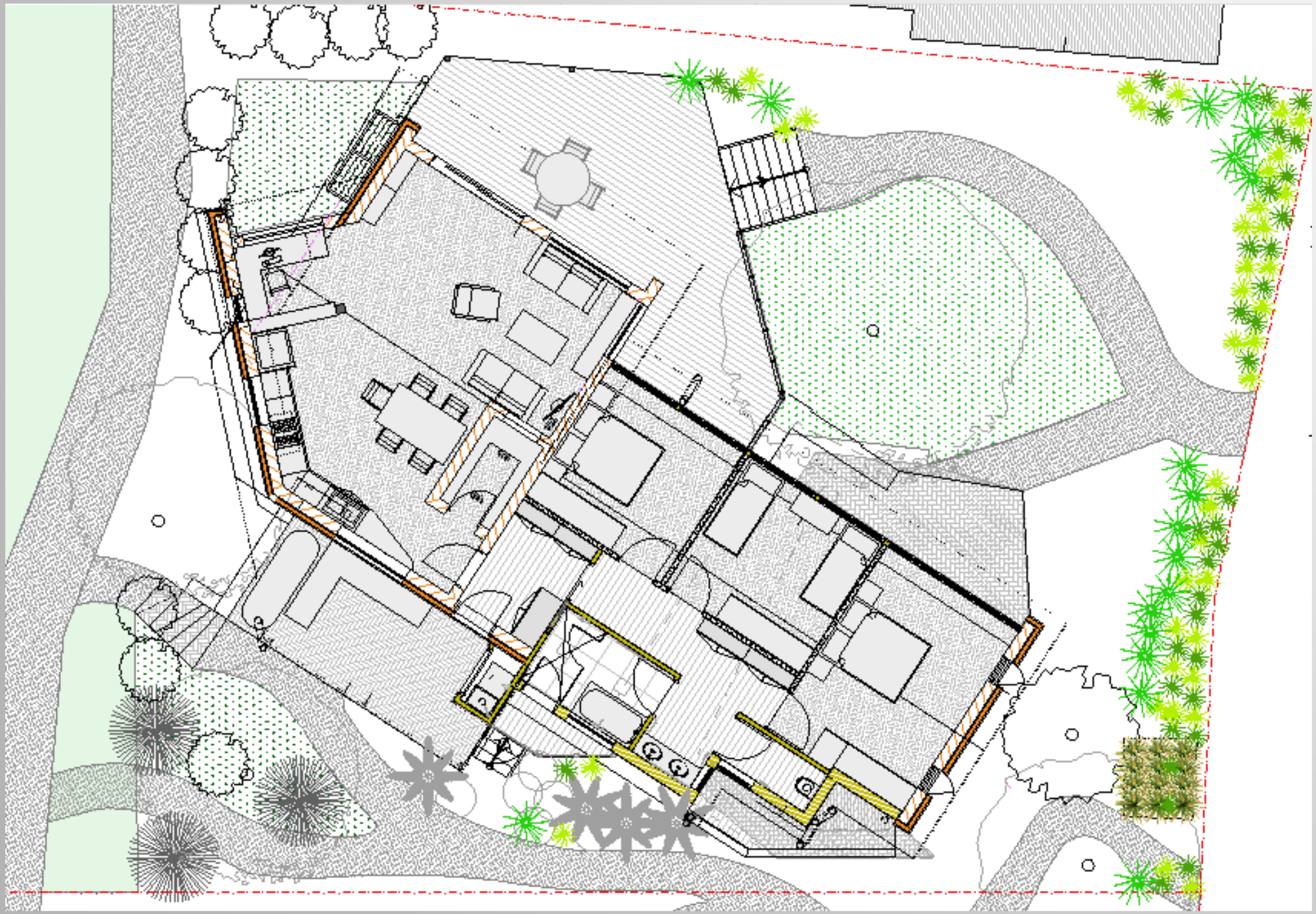
Narara Ecovillage



Narara Ecovillage

- House – 8.6 star
  - cooling 74% reduction
- Orientation – ideal to north
- Thermal mass
  - Slab on ground
  - Some reverse brick to east/west
  - Internal soil brick walls
- Insulation
  - R2.5 walls
  - Some straw panel walls – R4.1
  - R4.0 roof
  - Breathable membranes
- Windows – Composite single & double glazed
- Shading – sunhoods, eaves, pergola
- Colour – dark to north, light east/west
  - light roof

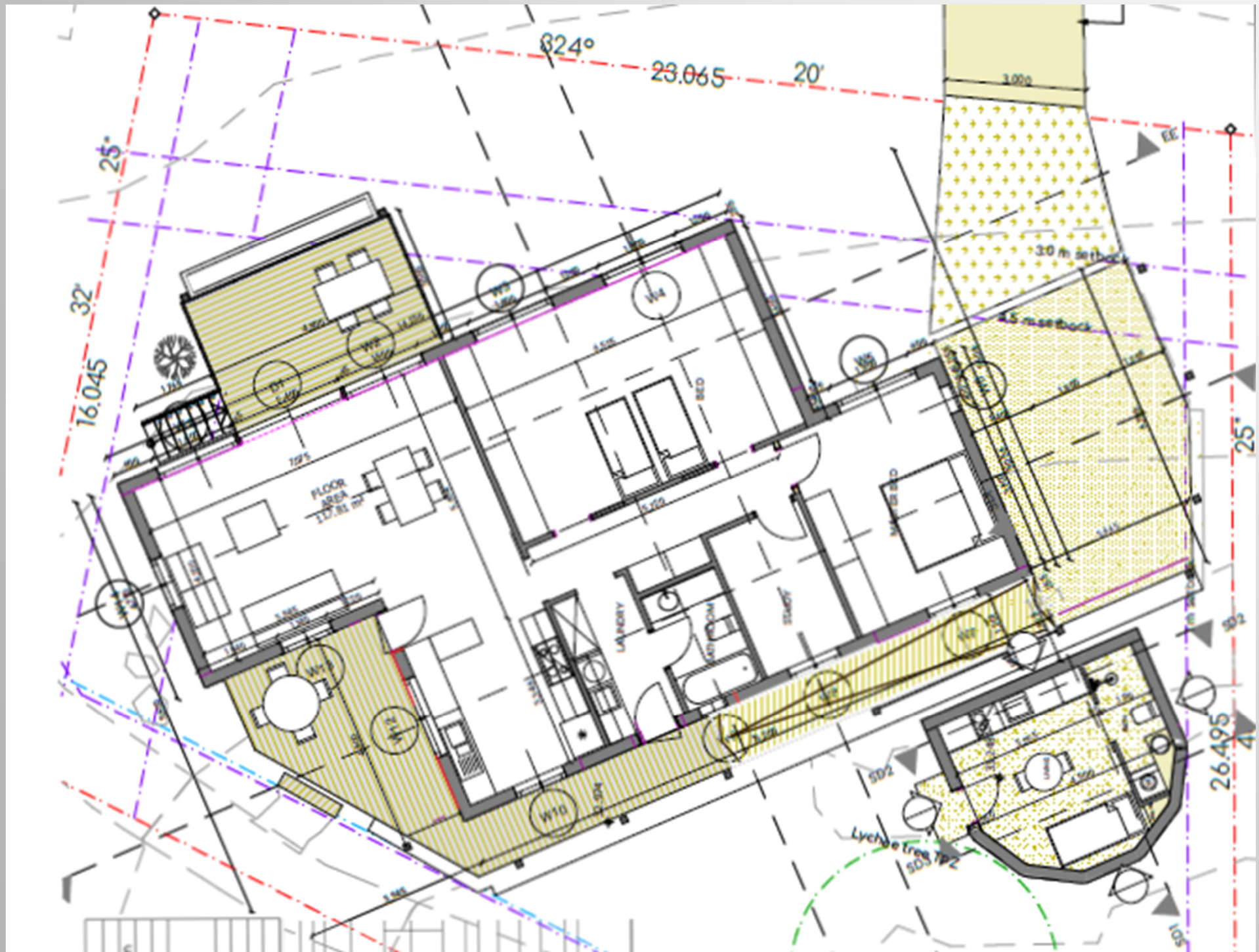
Narara Ecovillage



2 Kintay Lane

- **House** – 8.7 -8.3 star
  - cooling70% reduction
- **Granny Flat** – 7.9 – 7.8 star
- **Orientation** – ideal to NNE
- **Shape** – simple form
- **Thermal mass**
  - Clay floors on Hebel panel
  - Some cob walls
- Insulation
  - Straw panel walls – R4.1
  - R2.5 walls to gables
  - R4.0 roof
  - R5 under floor
  - Breathable membranes
- Windows
  - UPVC double glazed
  - Mostly north facing
- Shading – sunhoods, eaves, carport to east

2 Kintay Lane



ABSA
Australian Building Sustainability Association

www.absa.net.au

Sustainable House Day

www.sustainablehouseday.com

YourHome
Australia's guide to environmentally sustainable homes

yourhome.gov.au

Sanctuary
Modern green homes magazine

renew.
Leading in sustainability

http://www.renew.org.au

https://joshshouse.com.au

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dhwdesign.com