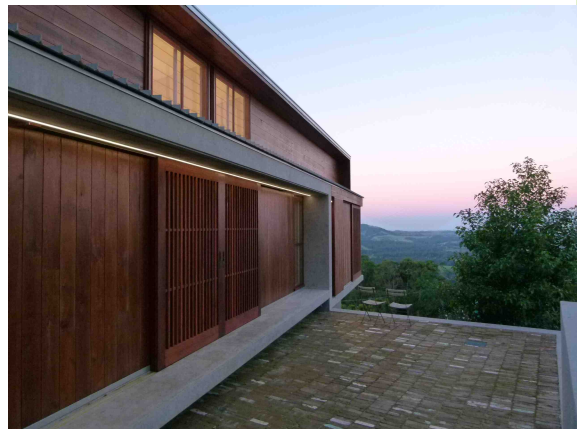
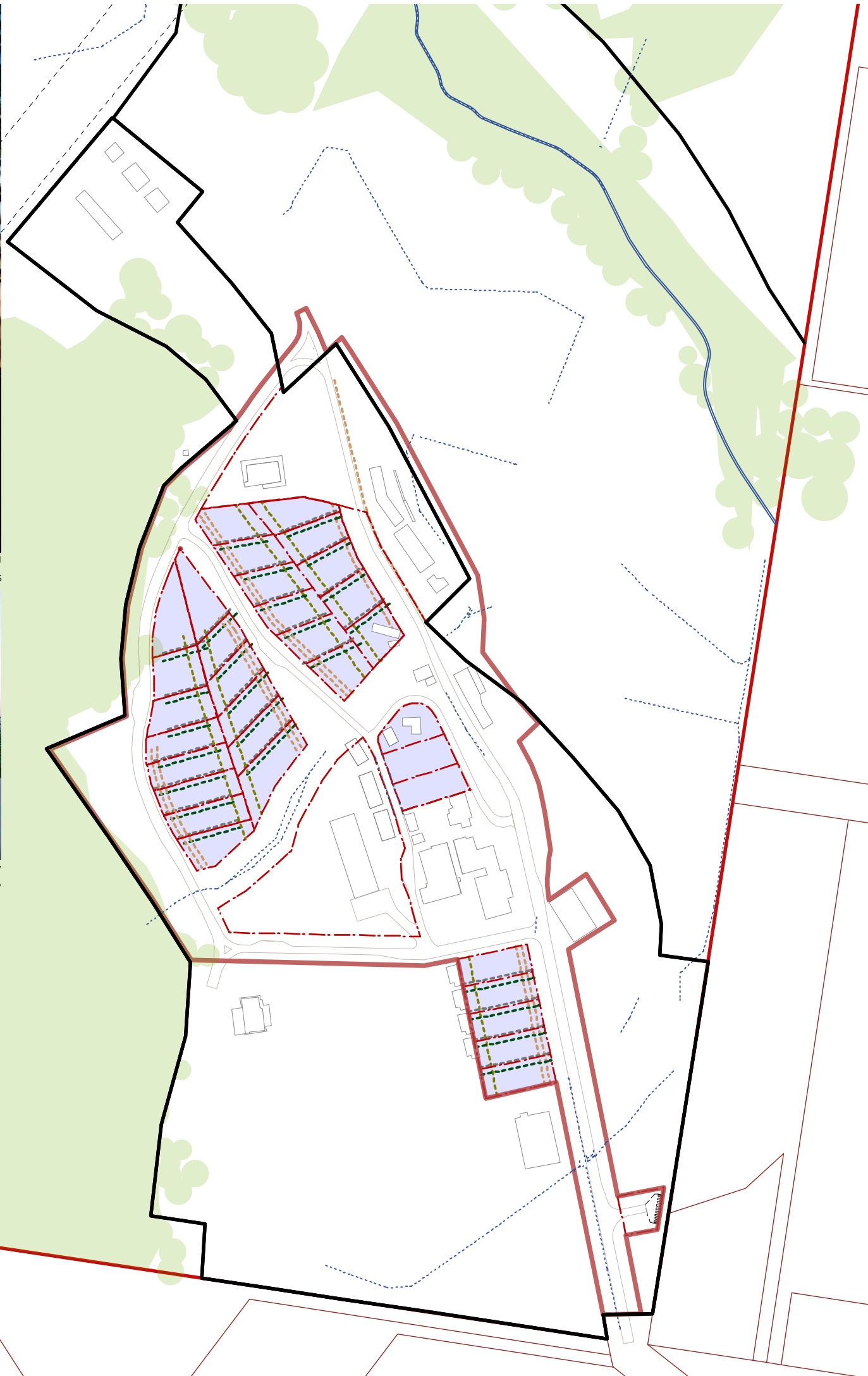




buildings can be sited to borrow the character of trees existing on the site and make magical outdoor rooms



buildings can be sited on sloping sites to bring together view sharing with privacy



# 4.0 Stage 1 Individual ownership elements

## The Houses - Placement on the lot

### 4.01

Principle; Site all houses on their lots so that they best use the available space and environmental qualities, considering the siting and amenity of their neighbours.

- Place houses on their lots to maximise their environmental performance in relation to solar access; and
- Site houses so that they consider the solar access and amenity of their neighbours. Rather than maintain a consistent line with adjacent buildings, houses can step forward or backward relative to their neighbours.

#### Street setbacks

Principle; Provide the nominated street setback, balancing the presence of gardens and the house to the street.

- Ensure that any on-site car parking in the front setback is subordinate to both the landscape and the house;
- Provide primary setbacks from the street lot boundary of generally between 3 and 6 metres; and
- Provide no setback requirements for secondary street or walkway frontages.

#### EXCEPTIONS

- A greater setback is allowed if it improves solar accesses for either the subject lot or its neighbours; and
- If off street parking is located under a house on a steeply sloping site, a reduced setback is desirable and allowable.

#### Side setbacks

Principle; Bias side setbacks to enable northern sun in winter to all houses, with a side landscape setting so that houses do not cumulatively form a wall across the contour.

- Make north side setbacks more generous; 900mm minimum, with a 3 metre average;
- Make south side setbacks tighter in dimension 0mm minimum, with a 900mm average; and
- Plant appropriate landscape between all houses for productive gardens, a green outlook, privacy screening.

#### Rear setbacks, Common Gardens and gardens

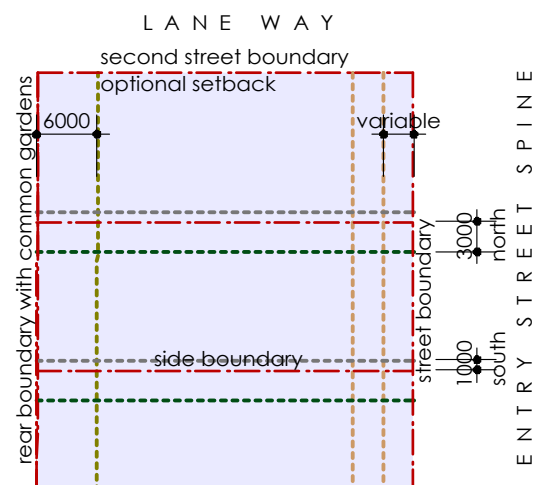
Principle; Provide generous rear setbacks to create consolidated bands of gardens along the contour across each block, containing the Common Gardens, common pathways and other landscaped areas.

- Provide the major garden spaces in the area of the rear setback, containing the Common Gardens and pathways, nominated for each block; and
- Allow minor structures, such as raised garden beds, playground equipment in the rear garden setbacks. Allow modest sheds, greenhouses, pools, spas, pergolas and the like in the garden and outside the area of the common garden. The footprint of these structures is to comply with each lot's footprint limitations. Private tennis courts are not allowed.

Refer to Illustrative House Types 5.01, 5.02 and 5.03 for application of the controls.

#### legend

- site boundary
- ▭ outline of 2(a) zoned land
- ▭ outline of Stage 1
- ▭ house lots
- primary street setback generally 3-6m, optional on secondary streets
- common garden setback 4m - small garden structures
- common garden setback 6m - buildings
- side setback 1m from south boundary
- side setback 3m from north boundary



Lot Setback Detail scale 1:750

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For  
**Narara Ecovillage**  
Co-operative Ltd

**NARARA ECOVILLAGE**

DATE 6 December 2013

SCALE 1:2500 / 1:750

0 125m

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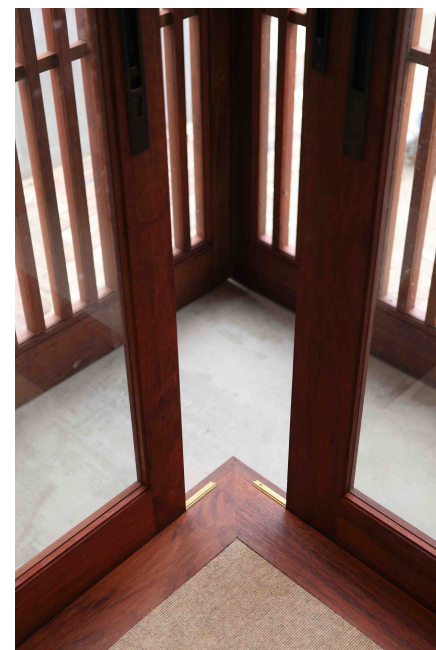
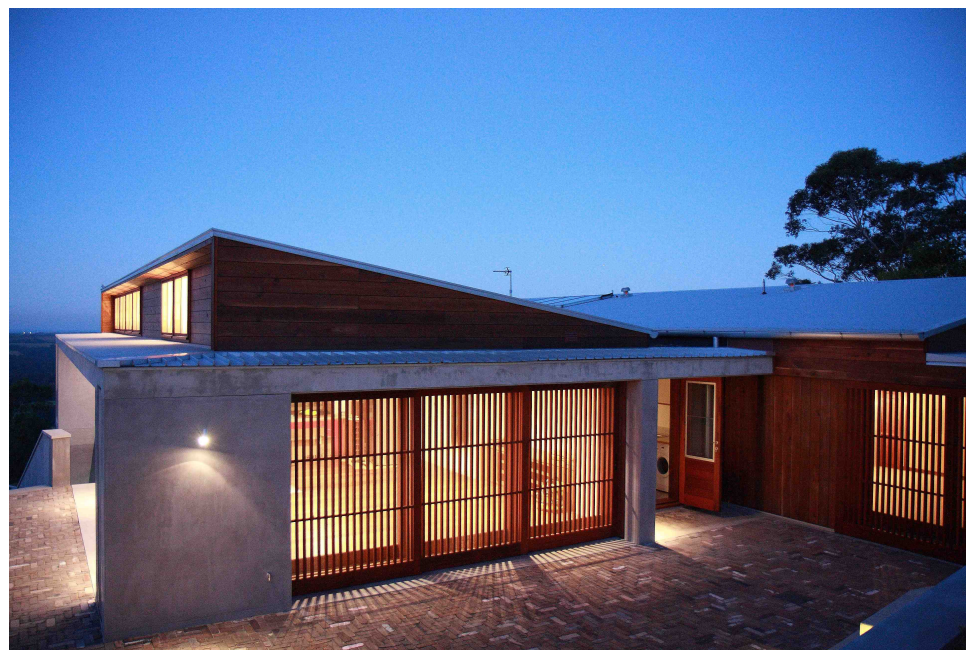
# 4.0 Stage 1 Individual ownership elements

## The Houses - Design

### 4.02

Principle; Design all houses based on the principles of environmental sustainability, incorporating passive solar design, sustainable use of materials, energy and resources.

- Design all houses to respond in a variety of ways to the slope of the terrain, sun and outlook;
- Encourage a variety of construction techniques, incorporating thermal mass and/or lightweight construction while responding to bush fire protection.
  - > Encourage underground, or houses with earth-covered green roofs, provided they have sufficient winter sun access and cross ventilation;
  - > Encourage framed houses with lightweight materials for ease of construction, economy, and "to touch the earth lightly", provided they incorporate adequate insulation and/or thermal mass;
- Consider adaptive reuse of all buildings on site and the potential for reuse of salvaged materials in the house, associated structures and garden elements;
- Limit the use of front and side fences, instead use planting and subtle level changes to define the edges of lots; and
- Establish an ecovillage review process of development proposals prior to lodging a Development Application with Council.



Housing design can arrange materials to protect timber within concrete framed reveals. Corners can be designed to open out to an expansive prospect or an intimate garden. Screens can provide security, privacy or shading and have a poetic effect at night.



Housing can use materials integral to their finish, toward having simple architectural character and low maintenance



housing can make connections to the site with top lights and low lights, picture windows and window seats.

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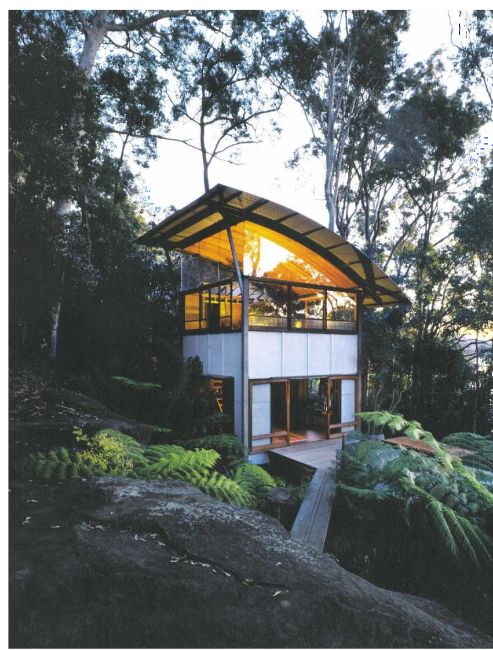
SCALE 1:2500

0 125m



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## 4.0 Stage 1 Individual ownership elements

# The Houses - Type and Size

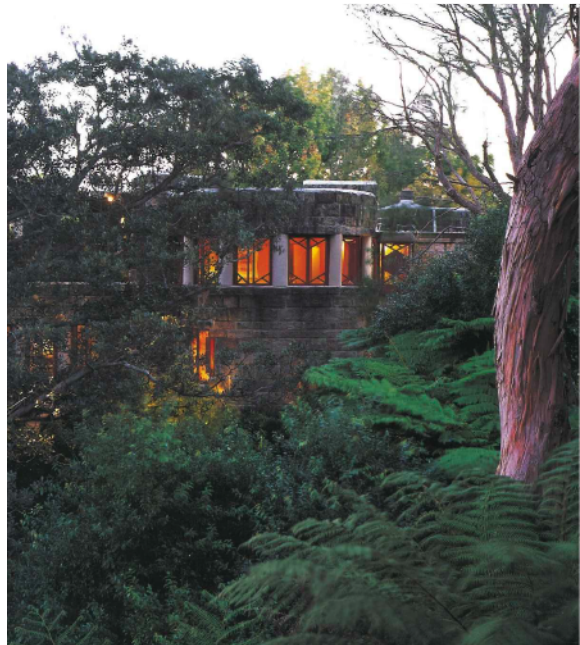
# 4.03

Principle; Limit the footprint and size of all houses to minimise energy use and resources, and so that the landscape becomes pre-eminent.

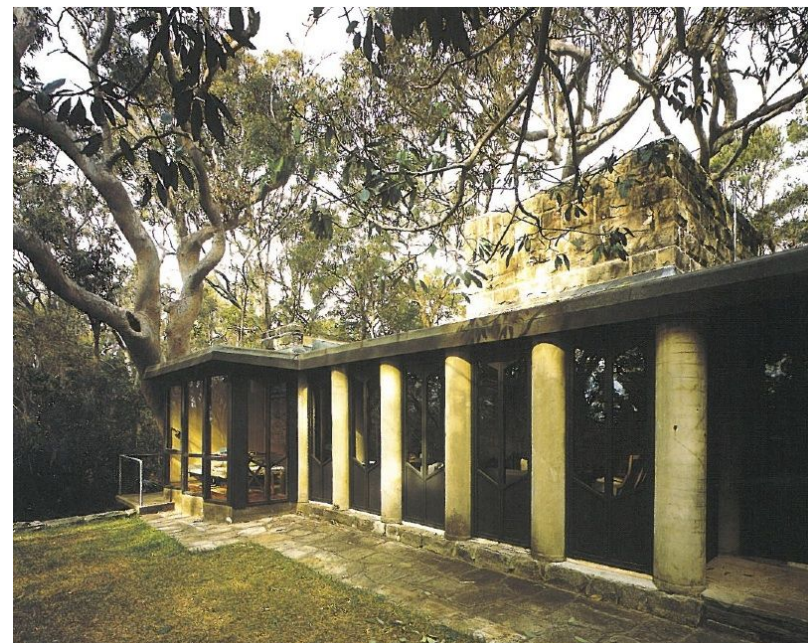
- Restrict the built footprint of all structures (including houses, decks, verandahs, sheds, pools, spas, pavilions, above ground water tanks, and the like) on each lot to a preferred maximum of 35% of the lot area (with 40% being allowed);
- Restrict the site coverage of above and below ground structures and hard impermeable landscaping to 45% of the lot area or 240m<sup>2</sup> which ever is the lesser;
- Associated with exceptions to 4.01 The houses - Placement on the lot : Street setbacks, restrict building frontages along street boundaries to 6m;
- Limit individual houses to a preferred maximum internal area of 150m<sup>2</sup> (with a maximum of 180m<sup>2</sup> being allowed); and
- Limit dual occupancies on individual sites to a preferred maximum internal area of 180m<sup>2</sup> (with a maximum of 240m<sup>2</sup> being allowed); with the preferred maximum internal area of any secondary dwelling limited to a maximum total internal area of 70m<sup>2</sup> (with a maximum of 120m<sup>2</sup> being allowed);

Refer to Illustrative House Types 5.01, 5.02 and 5.03 for application of the controls.

Housing can be modest in size to limit site coverage in favour of more expansive landscaped spaces. From left, 3m x 3m Permanent Camping by Casey Brown 9m<sup>2</sup>, 4.8m x 4.8m Israel House by Stutchbury Pape 70m<sup>2</sup>, 6m x 6m Box House by Neeson Murcutt 72m<sup>2</sup>



Housing on sloping sites can incorporate a variety of stone retaining walls to make garden areas more accessible.



Housing can sit above the ground plane with pole construction or be grounded with localised areas of excavation

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# 4.0 Stage 1 Individual ownership elements

## The Houses - Height

### 4.04

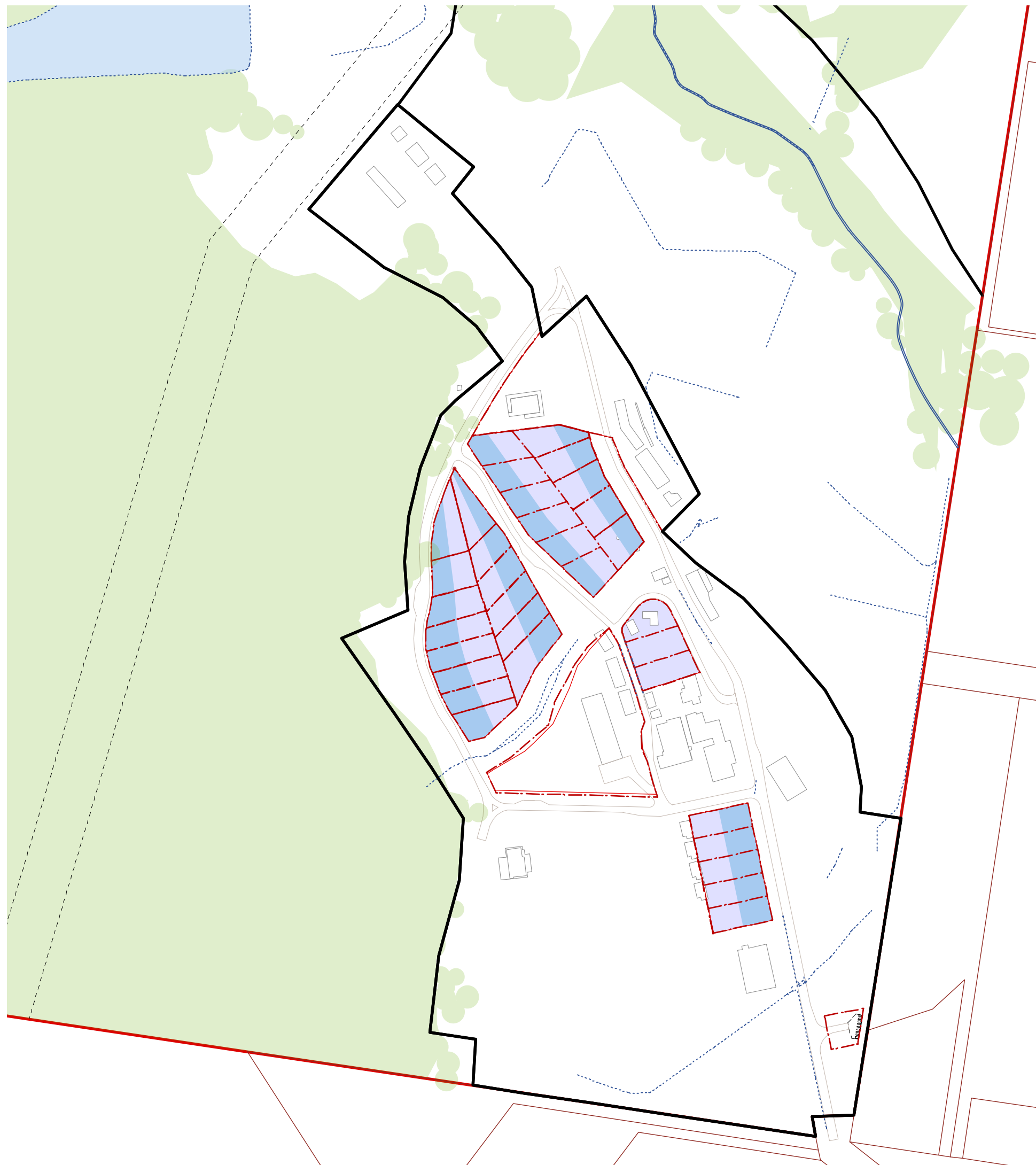
Principle; Concentrate building height toward the street frontage to consolidate and optimise sun access to the primary living spaces of neighbours and common gardens.

- Limit houses to a predominant maximum height of 8.0 metres (measured vertically from the existing ground level). Minor encroachments may be permitted due to the slope of the terrain, minor roof top elements, environmental systems such as solar collectors and the like. Any height above 8.0 metres (up to an absolute maximum of 10m) should be concentrated toward the street and not add any additional shadow over neighbouring lots; and
- refer to 4.06 Environmental Design - Solar Access and overshadowing, for sun access requirements.

Refer to Illustrative House Types 5.01, 5.02 and 5.03 for application of the controls.



Buildings of more than one storey in height, can potentially halve their building footprint, and release more areas of their site for outdoor living, trees and garden spaces.



- legend
- site boundary
  - outline of 2(a) zoned land
  - outline of Stage 1
  - existing building footprint
  - house lots
  - excedance to the predominant maximum building height of 8m, up to 10m allowed toward the street

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# 4.0 Stage 1 Individual ownership elements

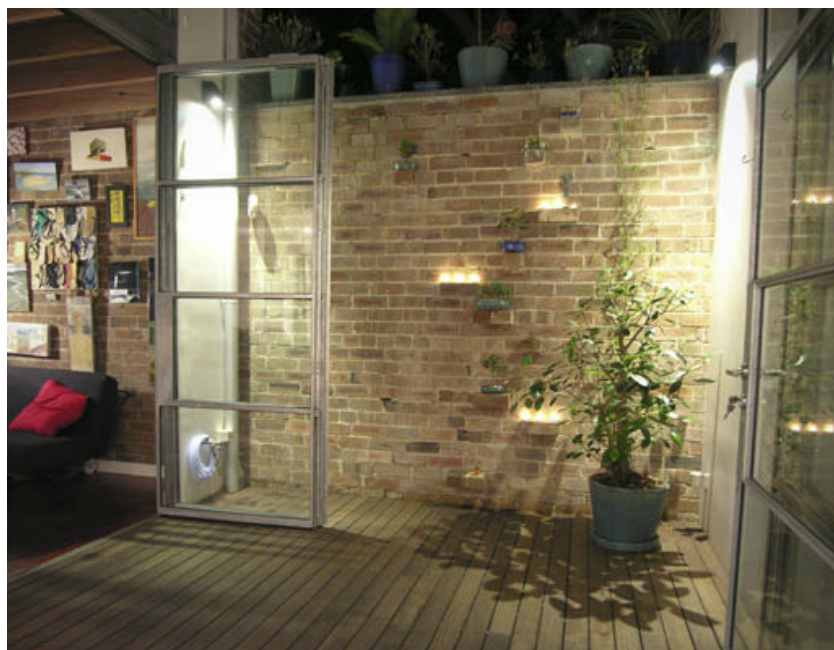
## The Houses - Materials and architectural character

### 4.05

Principle; Source low embodied energy, recycled or recyclable, plantation or certified materials as the predominant construction of dwellings.

- Select materials and construction methods must comply with the Bush fire Attack Level (BAL) provisions contained in the relevant Australian Standards;
- Adopt sustainable construction and disposal methods;
- Use various sustainable construction methods and materials, including alternative or experimental types, high thermal mass buildings of enduring and robust material palettes, lightweight construction of renewable building materials and the like;
- Select materials to adequately and economically perform their function and also have lower adverse environmental impacts throughout their life cycle;
- Encourage the use of materials that are sourced locally to reduce need for extensive transport and distribution requirements;
- Strongly encourage the use of FSC certified sustainably sourced timber;
- Select materials to contain reduced or nil hazardous substances, minimising as much as possible the use of known hazardous materials such as PVC;
- Ensure all interior building products: paints, adhesives, carpets and the like have low VOC; and
- Select low VOC exterior building products if possible, while considering exterior performance, durability and the like.

Also refer to 4.06 Environmental Design - Recycling



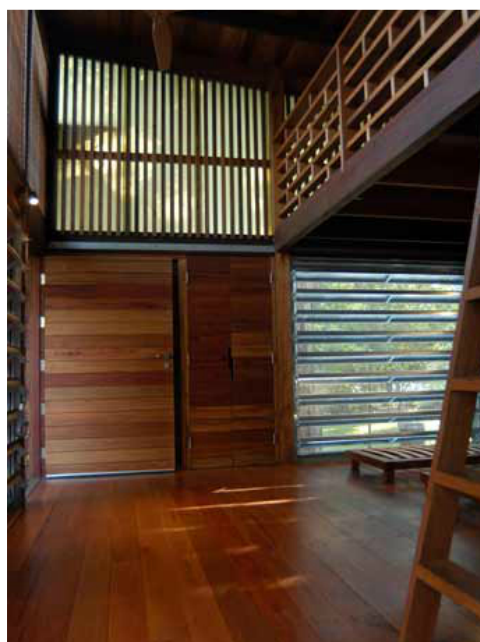
Brick is a durable building material able to be used. Brick has a high thermal mass, being slow to heat and slow to cool.



Recycled brick makes a playful and characterful paving surface.



Housing can use less usual materials, such as polished concrete and cork flooring. Cork, timber and plywood add warm character to rooms and soften sound.



Timber can be used for most building surfaces and add intimacy to rooms. Timber should be sourced from sustainable sources. Good quality timber can be recycled.



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ACTIVE SYSTEMS

**Water tanks** (part of the Integrated Water Cycle Management Strategy for the Ecovillage)

Principle; Provide all houses with water tanks to locally capture rain water for productive reuse.

- Include water tanks to maximise rainwater harvesting for all houses; average 10.5m<sup>3</sup> per household (external potable water back up would be provided from 45ML dam);
- Allow rainwater tanks to be above ground or in-ground, arranged individually or in series; and
- Use tank water with disinfection / filtration for potable purposes.

**Solar Power**

Principle; Provide all houses with the potential for renewable energy generation to meet energy requirements.

- provide renewable energy separately or as part of centralised system;

**Household Appliances and Systems**

Principle; Select all appliances and systems based on their environmental performance.

- Use energy efficient appliances and systems throughout, with easily-viewed monitors to regulate energy use;
- Install ceiling fans, flues and the like to assist with cooling bedrooms and living rooms. Air conditioning is strongly discouraged;
- Use efficient heating systems if required, appropriate to the type of house, such as hydronic heating;
- Use water efficient appliances and outdoor products, household water meters, timed showers, toilets, basins and the like;
- Use easily-viewed monitors to regulate energy use, water consumption, waste monitors and the like; and
- Include solar hot water heating in all houses.

**Recycling**

Principle; Use materials with potential for end of life recycling or which are manufactured with high levels of recycled or waste materials.

- Minimise waste, provide for composting, separate glass plastic, metal and paper;
- Reduce the demand for rare and/or non-renewable resources (such as rainforest and old growth forest timbers); Promote the use of materials that are made from or contain recycled materials or can be recycled at the end of their useful life;
- Make provision for recycling and temporary storage of waste vegetative material (chip & re-spread, compost); and
- Use recycled materials in paving / retaining and garden walls / steps / concrete / mulch and drainage materials, and the like.



small above ground water tank integrated with the house design



water pump and float switch



particulate filters and energy use monitoring



gas cylinders



low profile roof mounted solar hot water system with gas back up

Principle; Employ both passive design and active systems to achieve best possible environmental performance, adopting the principles of long life, loose fit, low energy.

- Surpass the minimum standards of policies such as DCP 108 Energy Smart Homes, BASIX, Natethers and Greenstar;
- Design all communal places and buildings, houses, associated outdoor areas and gardens to be to showcase environmental design;
- Consider all practicable environmental design initiatives in all aspects of the project; and
- Consider embedded energy and the scope for conservation and adaptive reuse.

PASSIVE DESIGN

**Solar Access and Overshadowing**

Principle; Site and design all houses to optimise sun and minimise overshadowing of neighbours, relative to each season.

- Design all houses on passive solar design principles, maximising winter sun to the main living rooms, and minimising direct summer sun to the interiors;
- Achieve a minimum of 3 hours sun at the winter solstice to major living spaces of all houses between sunrise and sunset - preferably all houses should receive some direct sun to a range of habitable rooms at all times of day;
- Place all houses to consider their overshadowing effects on the Common Gardens and neighbouring houses, and their ability to achieve the required solar access.
- Shade and insulate all houses to optimise thermal comfort;
- Incorporate passive design, using principles such as the radiant heat from floor slabs and the like for winter heating;
- Avoid internal rooms, so that all service rooms have daylight and fresh air;
- Design all openings relative to their orientation. Appropriate sizing, shading, screening and window operation needs to be carefully considered;
- Use appropriate plantings to temper summer heat and provide sunshading in summer, and improve the micro climate all year round; and
- Provide all houses with adequate clothes lines in preference to driers. Lines may be placed in sunny spots on the lot, and / or undercover.

**Natural Ventilation**

Principle; Design all houses to have excellent natural ventilation.

- Use any combination of cross ventilation, stack effect ventilation, thermal chimneys, adjustable vents and the like to maximise natural airflow;
- Consider carefully the window and door design and operation so that a range of ventilation options are possible without compromising security; and
- Arrange all subfloor and roof spaces should be both well ventilated and sufficiently insulated.



larger below ground water tank



## 4.0 Stage 1 Individual ownership elements

# The Gardens 1

# 4.07a

### Landscape – Common Gardens

Principle; Configure all lots so that they contribute to a site-wide system of Common Gardens in the heart of each block.

- Provide Common Garden plots as stipulated on the block plans. The Common Gardens are to have a minimum depth of 6 metres, and be supplemented by swales and common pathways.

### Landscape – Total Area of lot

Principle; Landscape all lots at Narara so that they predominantly comprise area for cultivated gardens and planting appropriate to Narara's environment.

- All lots must provide the stipulated area of Common Gardens for their block; and
- All lots must have a total soft landscaped area of a preferred minimum of 55% of their lot (with a minimum of 50% being allowed). Soft landscaped area excludes building footprints, sheds, pools, spas, pavilions, water tanks, impermeable elements, hard landscape and the like.

### Garden Spaces

Principle; Adopt permaculture principles and practices in all garden areas.

- Conserve and regenerate degraded land;
- Use plant species which are well adapted to their niche environment, and remove plant species which are listed as bushland weeds;
- Use the site's topography to generate a range of microclimatic conditions, both for public amenity and environmental biodiversity, for example, the creation of cool shady areas within the site's eastern gully; and
- Use planting and water storage for sustainable irrigation during long periods of dry conditions.

Refer to Illustrative House Types 5.01, 5.02 and 5.03 for application of the controls.



a variety of gardens are anticipated for food and pleasure, for social or solitary activities

- legend
- site boundary
  - outline of 2(a) zoned land
  - outline of Stage 1
  - existing building footprint
  - house lots
  - Common gardens - contiguous gardens in the rear of lots - 12m overall width

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### Permaculture

Principle ; The development of the Narara Ecovillage is under pinned by permaculture principles.

Permaculture is primarily a design system for an holistic approach to sustainable living and practice. It is the harmonious integration of design with ecology for creating sustainable human settlement. Working with nature, it takes natural systems as models to design sustainable environments.

The ethical foundations of Permaculture Care for Land, Care for People and Fair Share, guide the use of the 12 principals or design tools which mimic the natural order. They include 'designing from patterns to details', 'producing no waste', 'catching and storing energy', 'obtaining a yield' and 'integration rather than segregation' and can be seen to underpin all aspects of the development of the Narara Ecovillage.

Permaculture is an approach to designing human settlements and perennial agricultural systems, that mimics the relationships found in natural ecologies. It was first developed practically by Austrian farmer Sepp Holzer on his own farm in the early 1960s and then theoretically developed by Australians Bill Mollison and David Holmgren and their associates during the 1970s in a Series of publications. (sourced from wikipedia.org)

Central to permaculture are the three ethics: care for the earth, care for people, and fair share. They form the foundation for permaculture design and are also found in most traditional societies. Here are the 12 principles of permaculture as described by David Holmgren.

1. Observe and Interact - "Beauty is in the mind of the beholder" By taking the time to engage with nature we can design solutions that suit our particular situation.
2. Catch and Store Energy - "Make hay while the sun shines" By developing systems that collect resources when they are abundant, we can use them in times of need.
3. Obtain a yield - "You can't work on an empty stomach" Ensure that you are getting truly useful rewards as part of the working you are doing.
4. Apply Self Regulation and Accept Feedback - "The sins of the fathers are visited on the children of the seventh generation" We need to discourage inappropriate activity to ensure that systems can continue to function well. Negative feedback is often slow to emerge.
5. Use and Value Renewable Resources and Services - "Let nature take its course" Make the best use of nature's abundance to reduce our consumptive behaviour and dependence on non-renewable resources.
6. Produce No Waste - "Waste not, want not" or "A stitch in time saves nine" By valuing and making use of all the resources that are available to us, nothing goes to waste.
7. Design From Patterns to Details - "Can't see the forest for the trees" By stepping back, we can observe patterns in nature and society. These can form the backbone of our designs, with the details filled in as we go.
8. Integrate Rather Than Segregate - "Many hands make light work" By putting the right things in the right place, relationships develop between those things and they work together to support each other.
9. Use Small and Slow Solutions - "Slow and steady wins the race" or "the bigger they are, the harder they fall" Small and slow systems are easier to maintain than big ones, making better use of local resources and produce more sustainable outcomes.
10. Use and Value Diversity - "Don't put all your eggs in one basket" Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.
11. Use Edges and Value the Marginal - "Don't think you are on the right track just because it's a well-beaten path" The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.
12. Creatively Use and Respond to Change - "Vision is not seeing things as they are but as they will be" We can have a positive impact on inevitable change by carefully observing and then intervening at the right time.

David Holmgren is best known as the co-originator with Bill Mollison of the permaculture concept following the publication of Permaculture One in 1978. His passion about the philosophical and conceptual foundations for sustainability which are highlighted in his book, Permaculture: Principles and Pathways Beyond Sustainability inspired the permacultureprinciples.com website where you can learn more about permaculture and sustainable living.

### Hard landscaping

Principle; Keep an open and unimpeded landscape

- Avoid conventional fences; and
- Use modest landscape elements like platforms and low retaining walls to make places for happy socialisation.

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### Accessibility and Adaptability

Principle; Allow all houses to be adapted to suit their occupant evolving requirements.

- Encourage house types and configurations that allow for change and adaptation over time, beyond the limiting requirements of various codes and Australian Standards; and
- Allow where appropriate elements such as stair chairs, personal lifts and inclinators to be accommodated or retrofitted to provide access for residents with particular needs;

### Cars and Bicycles

Principle; Reduce car dependency, and contain most car parking to the common street reserve, or with as little intrusion as possible onto individual lots.

- Allow temporary parking for pick up and drop off to shared driveways on common property;
- Allow car storage under the house within the building footprint, on sites enabled by the terrain;
- Allow corner lots to have car access from their longer or side boundary;
- Carports are allowed. Free standing enclosed garages are not permitted; and
- Use of cluster parking areas on common property is preferred but is not mandatory.

Refer to Illustrative House Types 5.01, 5.02 and 5.03 for application of the controls.

