



# Woodland

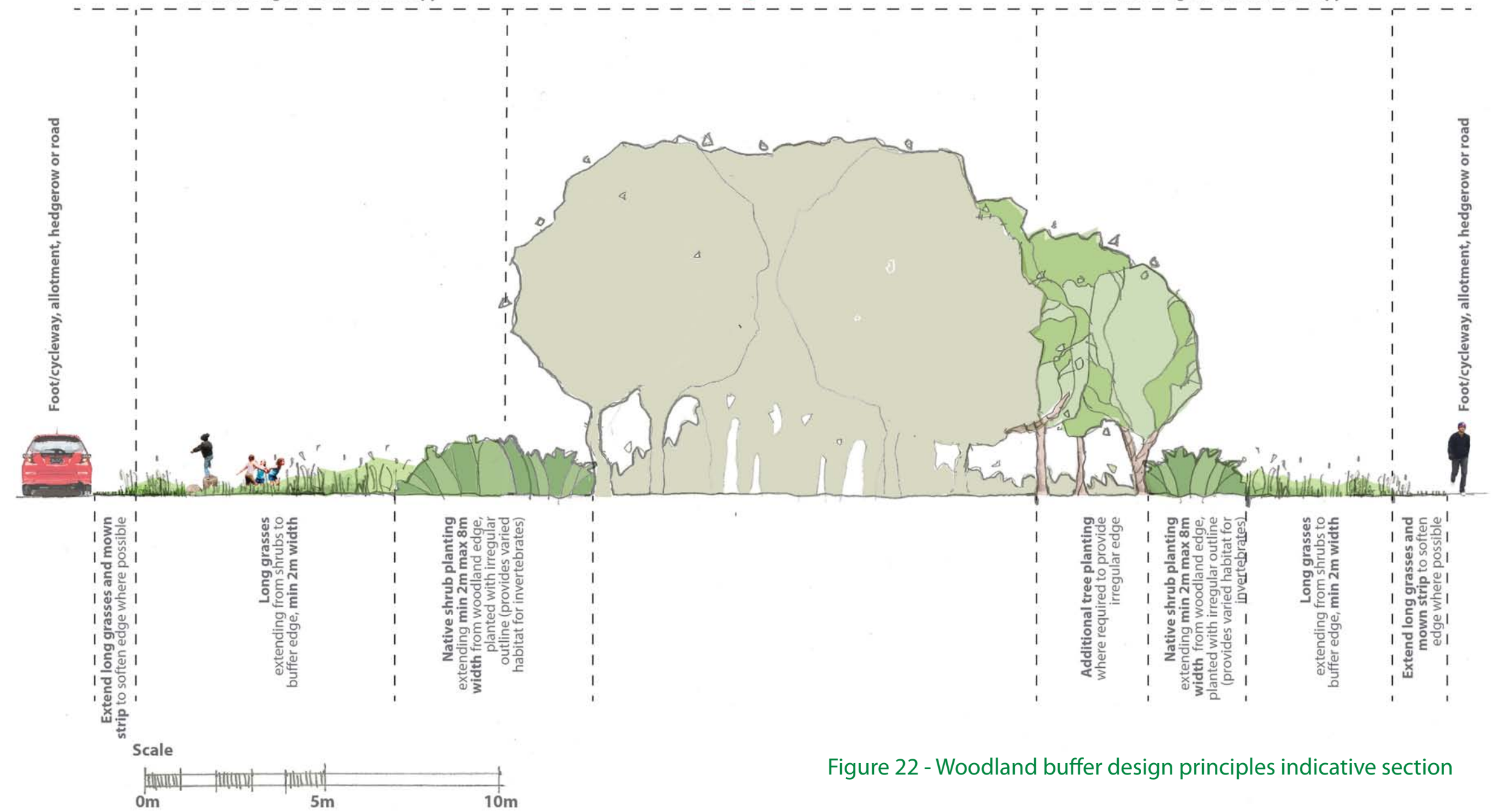
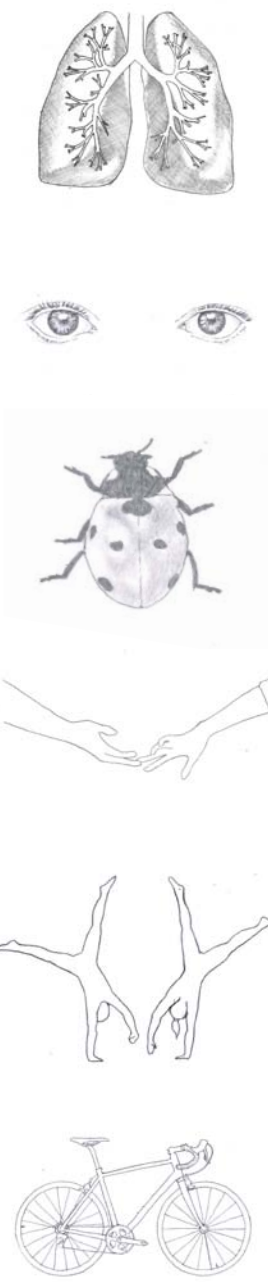


Figure 22 - Woodland buffer design principles indicative section



Precedent images

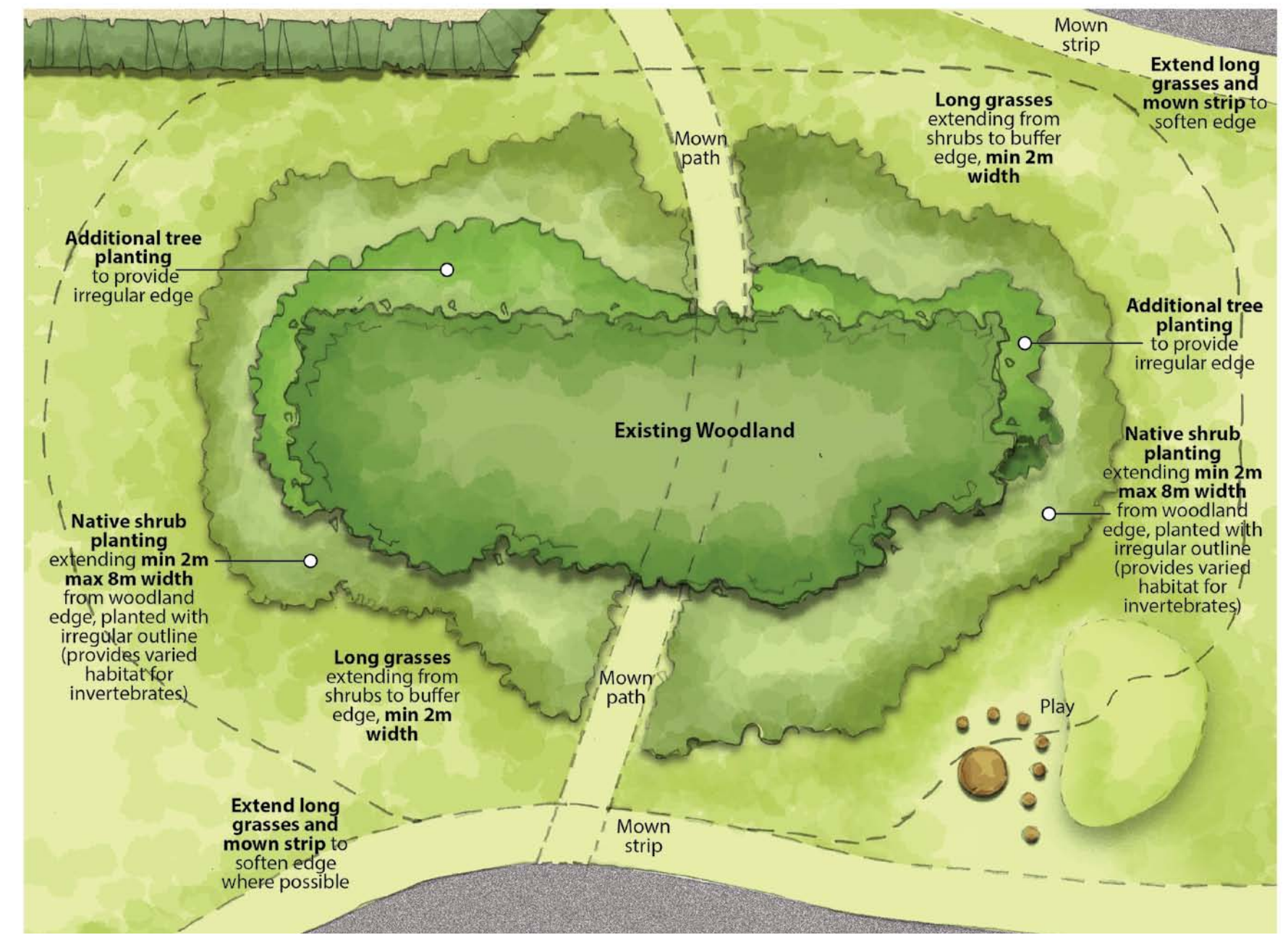


Figure 23 - Woodland buffer design principles indicative plan

## Key Interfaces & Buffers - Woodland

Existing woodland habitat is protected and enhanced by buffer zones. The buffer extends to a minimum of 10m from the canopy.

The buffer provides supporting habitat to the woodland and space for fauna to enter, exit and circulate around the woodland. The buffer (and the woodland where possible) will also include access for human activity, hard surfaced and mown or earth paths and natural play features.

The supporting habitat comprises tree planting (where necessary to soften the woodland edge), shrub planting, long and short grasses and wildflowers.

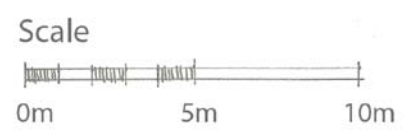
An indicative plan and section are shown in figures 22 & 23. These drawings set out the principles to be applied in designing the buffer zones and their integration with the wider landscape and infrastructure/built form.

## Acceptable inclusions

- Supportive habitat planting
- Foot and cycleways
- SuDS features
- Natural play
- Street furniture that enhances user experience e.g. benches, information boards, wayfinding
- Public Art
- Maintenance access
- Fencing (only if necessary to protect sensitive fauna/flora or for health and safety)



Precedent images



Features to protect or encourage fauna such as bird boxes

All other activities/features are excluded including:

- Lighting
- Allotments
- Formal Play
- Structures
- Vehicular route

# 6. Sport and Play

Play provision will be provided that is fun, educational, accessible, safe and varied. A number of scales and type of play will be catered for taking account of age provision requirements and distance criteria. They will include the formal provision of NEAPs, LEAPs and LAPs and also informal and natural play incorporated site wide in suitable locations with especial focus on the edge zones, buffers and green loops linear park. Some examples of formal play provision are illustrated on this page. There is further information on natural play within section 8 of this report.

Sport provision is located centrally at the village green and to the south of the community farm there is a school sports pitch. More information on the Village Green can be found in section 4 of this report.



Figure 24 - Example LEAP design - NW Bicester Exemplar

**Play and sport design**

- Orientate pitches and courts for optimal sun path
- Use vegetation to provide shelter from prevailing winds
- Position trees and shrubs to avoid excessive leaf fall on sports pitches and courts
- Provide level access and ensure accessibility
- Provide fun, varied and interesting play options that stimulate imagination and entertain
- Locate play space to ensure natural surveillance is provided by adjoining land uses, footways, cycleways and highway.



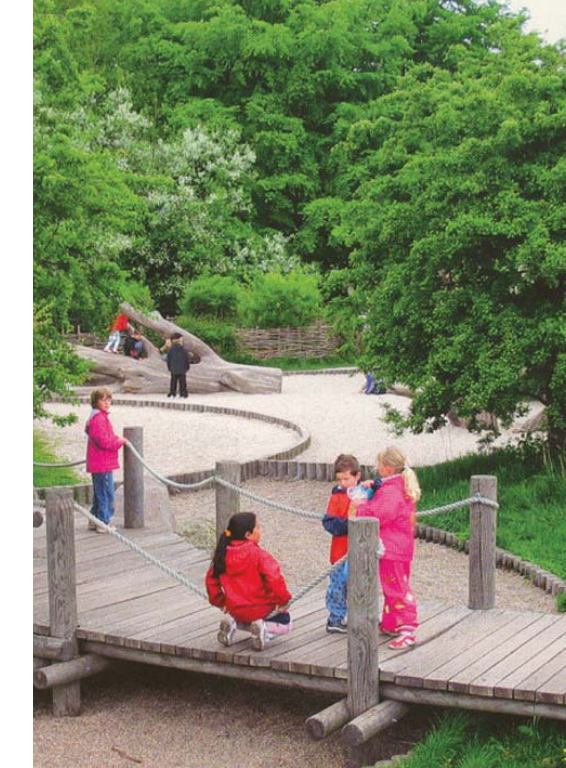
Richter Spielgerate sound arch



Beaufort Park LEAP



Footprints play ground



LEAP precedent image



Timberplay swing

## Play Areas in Green Infrastructure

- Play spaces take advantage of the existing natural elements
- Play areas provide a wide range of experiences
- Play spaces meet CDC age provision requirements
- Natural play is incorporated to play experiences
- Play space allocation is in accordance with distance criteria
- Additional play areas (not shown on this plan) will be provided within housing areas, to meet required areas and distance criteria.

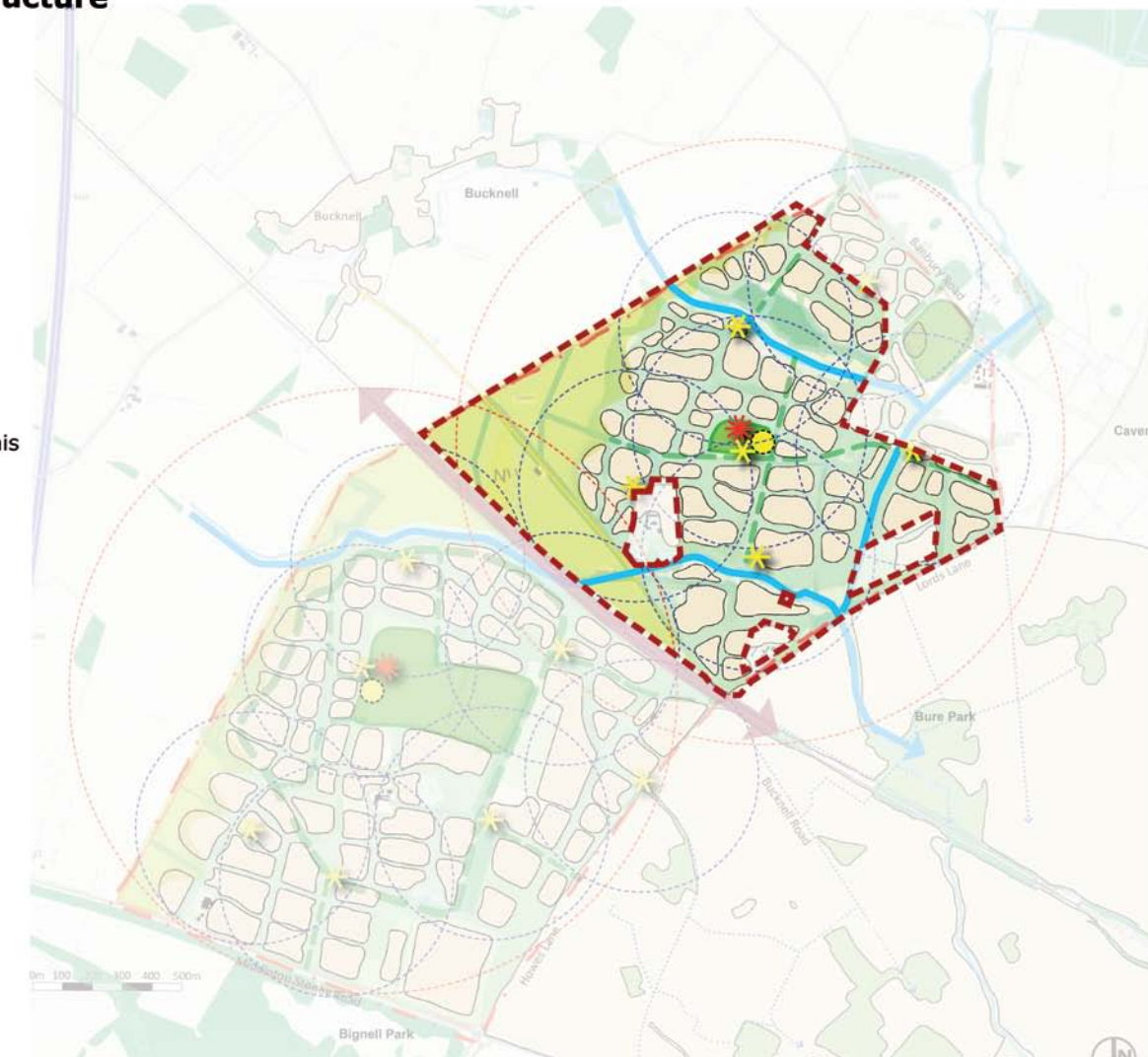


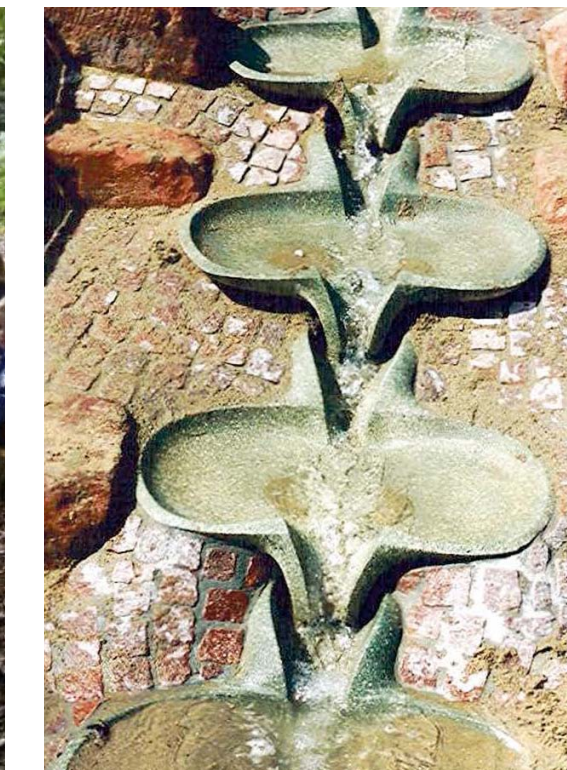
Figure 25 - Masterplan play provision (Application 1 area highlighted)



Figure 26 - Example NEAP design - NW Bicester Exemplar



Forest School precedent image



Richter Spielgerate Virbela Basin



Timberplay slides



Timberplay cross scales



Timberplay swing

Play - precedent images

# 7. Food Production

A productive landscape that echoes the site's previous and adjoining agricultural landuse and enables residents involvement with food production, is woven into the GI. This takes the form of allotments, community orchards and a community farm. Orchards and other edible planting will be integrated with the public realm, for example within the Green Loops Linear Park. This may include opportunities for natural foraging for residents and wildlife, for example along woodland edges. Methods for applying low maintenance food production include forest garden and permaculture both of which are increasingly used in the UK.



Figure 27- Allotment Provision

To encourage healthy eating, we've included community orchards and allotments for growing local food and we aim to plant a fruit tree in every single garden.

## Allotment provision

Allotments will be located to take advantage of south facing aspect, shelter from prevailing wind, availability of water supply, accessibility, ease of use and natural surveillance. They will be located across the site no more than a 10 minute walk from all residential properties and with (limited) vehicular access nearby for maintenance and accessibility. Smaller areas of allotment to be woven into the development within the housing area, edge zones and green loops linear park. Some of the benefits of allotments are set out below:

- eating fresh food from a known source;
- improving understanding about food production and the real costs involved;
- reconnecting with the land;

- improving knowledge of seasonality;
- experiencing improved wellbeing through better diet, physical work, socialising and spending time in the outdoors;
- having a sense of belonging to a community;
- being able to influence the local landscape;
- improved social networks, social responsibility and a sense of community and trust;
- the environmental benefits of fewer 'food miles', and less packaging

Precedent images and an example of allotment design from the NW Bicester Exemplar can be seen to the right.

## Allotment design

Maximise sunlight by location and utilisation of south facing slopes.

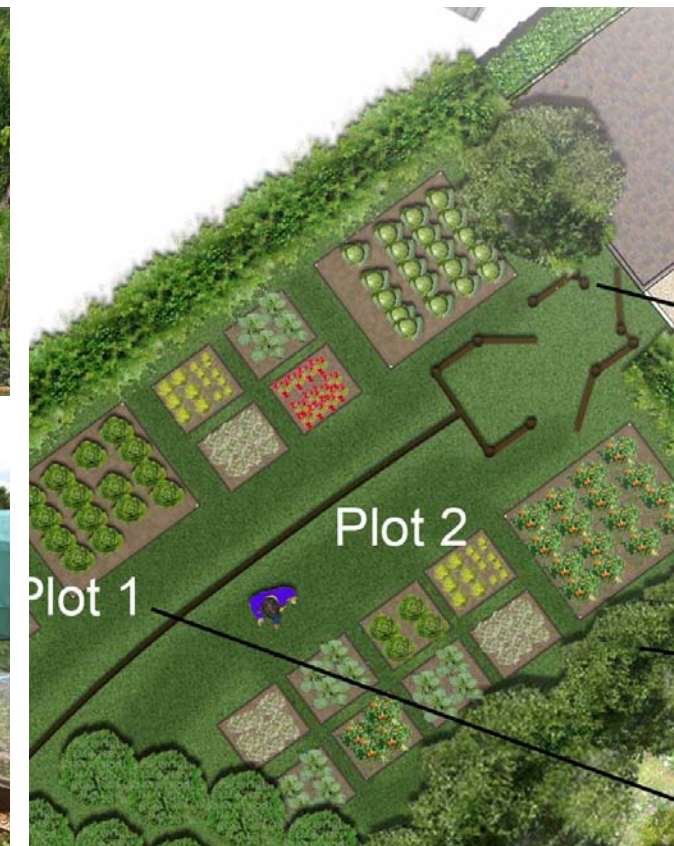
Position trees and tall structures away from allotments to prevent loss of direct sunlight

Ensure soil properties and depth suitable as growing medium

Provide level access and option for raised beds for access by disabled users

Use vegetation to provide shelter from prevailing winds

Remove need for piped water by providing rainwater harvesting and/or location to take advantage of SuDS



## Orchard provision

Orchards will be located to take advantage of south facing aspect, shelter from prevailing wind, accessibility, ease of use and natural surveillance. They will be located across the site in locations convenient to residents, particularly within/adjacent to the Green Loops Linear Park (including the river corridor) and edge zones, with smaller areas of orchards and individual fruit trees to be woven into the development within the housing area.

The orchards will contribute to the creation of a mosaic habitat of value to flora and fauna. For example tree spacing will be suitable to allow wildflowers to grow beneath, the trees can support birds, beetles and lichens and fruit tree blossom is a valuable early nectar source for bumblebees and solitary bees fresh out of hibernation. The fruit can provide food to mammals and birds in the autumn months.



## Orchard design

Provide protection from prevailing winds using features of the site/scheme such as topography, buildings, hedgerows or shelter belt planting specific to the orchards, to create protection for successful insect pollination and fruit formation.

In shelterbelts or nearby planting use native plant species with early formation of leaf and flower

Use uniform grid pattern of trees that allows for the necessary and appropriate spacing between trees and rows.

Suitable varieties with synchronisation of flowering times for the purposes of successful fertilisation and production of fruit to be specified.

The trees are to have the appropriate dwarf root stocks. This will ensure that the trees do not exceed a height where fruit picking is easily conducted by residents.



## Community Farm

The Community Farm is located within 'The Triangle' area of the Application 1 site. This location has been carefully considered to be well connected by road, footpath and cycleway to both the existing and proposed residential areas and proposed school and community facilities. It is proposed that the farm will host community supported agriculture. Options for the farm include space for a weekend market, cafe and event space. Benefits of community supported agriculture to the community (as set out by Making Local Food Work - <http://www.makinglocalfoodwork.co.uk/about/csa/BenefitsofCSA.cfm>) include:

- receiving fresh food from a known source;

'Space will be provided for a farmers' market that will sell locally produced food. We're even creating edible landscapes to encourage foraging and understanding of wild foods.'



Figure 28- Community Farm sketch layout



Community Farm precedent images

- improving understanding about food production and the real costs involved;
- reconnecting with the land;
- improving knowledge of seasonality;
- learning about new and traditional varieties of fruit, vegetables and herbs;
- having access to a farm as a resource for education, work and leisure;
- experiencing improved wellbeing through better diet, physical work, socialising and spending time in the countryside;
- having a sense of belonging to a community;
- being able to influence the local landscape;
- improved social networks, social responsibility and a sense of community and trust;
- the environmental benefits of fewer 'food miles', less packaging, ecologically sensitive farming with improved animal welfare;
- a local economy enhanced by higher employment, more local processing, local consumption and a re-circulation of money through 'local spend'
- a shift in attitudes to food and farming and therefore a shift in 'food culture'

More detail can be seen on the Triangle and the Community Farm within section 4 of this report.

# 8. Climate Change Resilience

## Green Infrastructure (& Water Management)

The predicted future climate of hotter, drier summers and warmer, wetter winters will have significant impact on outdoor environment; therefore green infrastructure and landscape have important roles on providing comfort environments. The following (tables 1 to 3) adaptation measures are based on extracts from the report *Design for Future Climate - Adapting Buildings Programme by the Technology Strategy Board (TSB) 2013* prepared for NW Bicester Eco Development. . These measures were identified to be considered as relevant for NW Bicester Eco Development.

Reference is also made to Water Sensitive Urban Design in the UK by CIRIA 2013. Further information on Water Sensitive Urban Design (WSUD) and Sustainable (urban) Drainage Systems (SuDS) is available at the Landscape Institute – ‘Landscape and Water’

<http://www.landscapeinstitute.org/knowledge/Landscapeandwater.php>



Table 1 - Public Realm Adaptation Measures

Adaptation Element	Measures for Adapting to impacts from	Climatic change that the adaptation is responding to	Climate change hazard	Climatic change impact
Public amenities and Infrastructure	Add shading to transport infrastructure, such as bus stops and cycle racks	HEAT	Peak summertime temperature increase Summertime solar intensity increase	Overheating in summer leading to discomfort, ill health and degradation of materials
	Add seating in shaded areas, on streets & in POS	HEAT	Summertime temperature increase and measurable heat wave projections	Building overheating in summer leading to discomfort, ill health
	Ensure pedestrian and cycle routes are sheltered from high winds/storms, e.g. by soft landscaping	STORM	Wintertime mean precipitation increase	Increased flood vulnerability and building structure/material degradation
	Replace pavements and roads with porous, 'cool' materials	HEAT & INCREASED RAIN AND STORMS	Wintertime mean precipitation increase	Increased flood vulnerability and water ingress for buildings
	Use energy efficient street lighting and/ or switch street lights off for periods of the night	ENERGY	Peak summertime temperature increase	Higher temperatures cause increased cooling load increases energy demand & energy poverty
	Design streets to encourage walking, cycling and public transport, e.g. reduce parking spaces, develop 'home zones'	HEAT	Peak summertime temperature increase	Building overheating in summer and urban heat island effect leading to increased energy demand

Table 2 - External Water Management Adaptation Measures

Adaptation Element	Measures for Adapting to impacts from, and mitigating future climate change	Climatic change that the adaptation is responding to	Climate change hazard	Climatic change impact
Water (neighbourhood level)	Install blue infrastructure: lakes, ponds, and other water landscape features	HEAT	Summertime temperature increase and measurable heat wave projections	Overheating in buildings further increased by urban heat island effects
	Install 'green' swales	HEAT, STORMS and INCREASED RAINFALL	Summertime temperature increase and Wintertime mean precipitation increase	Overheating in buildings and Increased flood vulnerability
	Install 'urban' swales / rills	HEAT, STORMS and INCREASED RAINFALL	Summertime temperature increase and Wintertime mean precipitation increase	Overheating in buildings further increased by urban heat island effects and Increased flood vulnerability
	Integrate blue green corridors	HEAT	Summertime temperature increase and measurable heat wave projections	Overheating in buildings further increased by urban heat island effects
	Enhance flood alleviation capacity for existing water courses, such as scrapes and attenuation features	STORMS and INCREASED RAINFALL	Wintertime mean precipitation increase	Increased flood vulnerability and water ingress for buildings
	Install permeable / porous paving	HEAT, STORMS and INCREASED RAINFALL	Wintertime mean precipitation increase	Increased flood vulnerability and water ingress for buildings

Table 3 - Summary of Adaptation Measures

Catalogue	Adaptation Measures
Water Conservation (neighbourhood level)	Sustainable drainage systems
	Urban flash flooding
	Ground water levels changes
	River flood defences
	Water flow obstruction and erosion management
	Increase green cover, wetlands and trees
Green Infrastructure	Install blue infrastructure: lakes, ponds, and other water landscape features
	Install a pond or other water feature e.g. pool
	Plant more street trees/ Shaded outdoor space
	Design selected streets as greenways / boulevards
	Enhance vegetation if the soil has good infiltration qualities
	Plant trees with large canopies - using caution not to compromise building stability
Public Realm	Plant heat, drought and pollution tolerant plants (Xeriscaping)
	Plant drought resistant plants -Good examples Birch, Alder, Yew, Beech, Italian Alder, Box, Privet.
	Species (Willows, poplars & oaks) should not include as these can cause low level ozone production under high temperatures
	Set aside space to grow food
	Remove/ reduce non-porous garden surfaces. Replace with an alternative: grass-reinforcement concrete or plastic mesh, gravel, brick (with drainage channels), cellular paving, or lawn or vegetable plots
	Add shading to transport infrastructure, such as bus stops and cycle racks
Public Realm	Add seating in shaded areas, on streets & in POS
	Identify and allocate appropriate buildings as 'community cool rooms'
	Ensure pedestrian and cycle routes are sheltered from high winds/storms, e.g. by soft landscaping
	Replace pavements and roads with porous, 'cool' materials
	Design streets to encourage walking, cycling and public transport, e.g. reduce parking spaces, develop 'home zones'

## Implementation of Adaptation Measures

The developer, A2Dominion, and the design team have taken a proactive approach to future climate risks by being engaged within the process from an early stage. A2Dominion has adopted this approach as the development is designated as an eco-town and has been designed to meet the requirements of PPS1 Eco-town supplement; which specifically states that the development should be designed to take account of future climate change conditions.

- Application 1 incorporates Green Infrastructure adaptation measures that include:
  - Landscaping strategy to create shading and green roofs
- The development will be designed to ensure that all buildings are located outside of the 1:100 year plus climate change and 1:1000 year flood zones.
- Sustainable drainage systems (SuDS) and Water Sensitive Urban Design (WSUD) good practice is proposed for all streets, open spaces and Green Infrastructure. This comprises soakaways, swales (green and urban) and ponds; plus adopting an innovative drainage system that utilises overland flow as a predominant pathway relative to exceedance events.
- Control of both flow, volumetric discharge and water quality of surface water has been designed to improve baseflow through use of attenuation ponds;
- To relieve water resource stress through the introduction

of rainwater harvesting and reuse into each dwelling to reduce potable water use.

- The inclusion of drought tolerant species within planting plans for landscaped areas
- Landscape design that includes street trees to provide shade and cooling; including shaded seating.
- Tree pits designed to maximise resilience to water stress (e.g. trench planting along primary roads).
- A number of streets would be green lanes; at minimal width with no separate footpaths but instead include green vegetated margins; maximising the existing site vegetation such as perimeter hedgerows and hedgerow trees
- Primary community route located within river corridor as Blue Green recreational route, suitably sheltered and shaded by riparian planting
- Inclusion of wetland areas within the landscaping to enhance biodiversity, along with attenuation ponds, to form part of a 'blue' infrastructure to manage water
- Planting to include areas of low maintenance such as wild flower grass areas and formal planting including drought and some pollution tolerant species.
- Existing hedgerows retained and enhanced by new 'buffer zones' creating wide green corridors throughout the development plots, assisting with combating heat island effect



Precedent images