

3.2 continued:  
**Infrastructure**

**PLAYSPACE STRATEGY**

Provision for children and young people is a key component of the master plan. In developing the play space strategy, reference has been made to the Six Acre Standard by the National Playing Fields Association, Cherwell Recreation Strategy 2007-2012 and PPG 17 Open Space Assessment – Provision for Children and Young People, by Cherwell District Council.

A primary aim of the play space strategy is to provide a diverse range of safe, attractive and stimulating spaces throughout the development, easily accessible and catering for all age groups. Areas of play have been located to coincide with primary footpath and cycle routes, to help ensure that they are lively, well used public spaces central to the new community. Where possible, play spaces have been combined with open space, public squares or

pocket parks. Above all, play areas should provide exciting and stimulating environments for children and families to enjoy. The provision of equipped play space is shown on figure 3.8 and will comprise a combined neighbourhood and local equipped play area (NEAP and LEAP) on the southern edge of Whitelands character area and a further three LEAPs positioned to ensure all housing is within approximately 5 minutes walking time of the facilities.

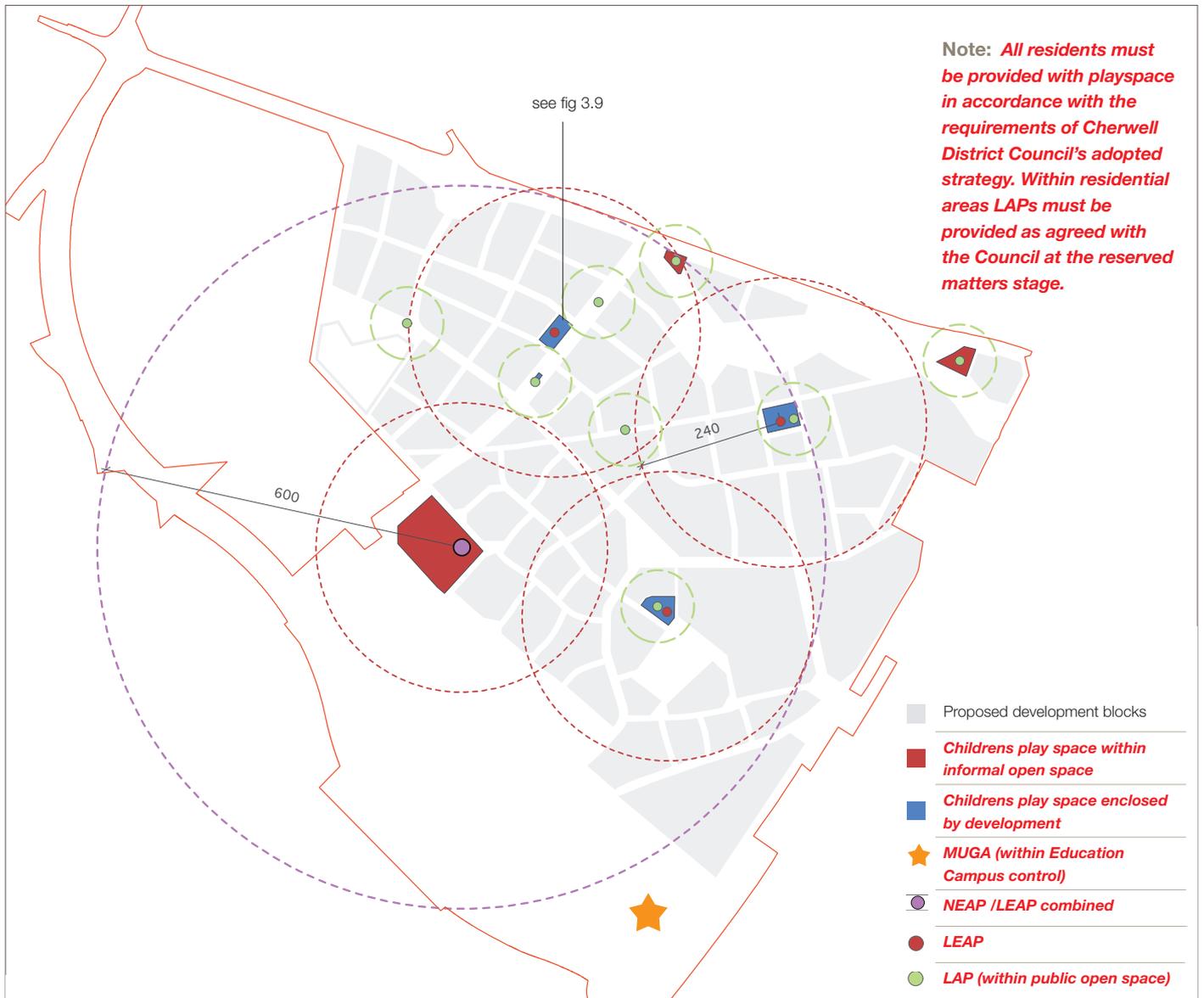


Figure 3.8 Play spaces.



Eight local areas of play (LAPs) are proposed in areas of open space, again located to ensure an even distribution across the site. Where LAPs are located within areas of open space, such as greenways, they have been positioned to allow natural surveillance by adjacent housing. **All LAPs must be easily accessible to pedestrians and positioned in either traffic free or traffic-calmed public areas.**

The location of LAPS within the development block is to be submitted by individual developers as part of Reserved Matters applications. The design of these public spaces should accord with the coding in Section 4.

Provision for older children will include some form of multi-use game(s) adjacent to the Education Campus, along with the comprehensive provision of formal open space nearby.

In addition to designated areas of play, approximately 14 hectares of informal open space will provide a valuable natural environment for children to explore and enjoy. Existing features, such as the ridge and furrow at Whitelands park, provide an opportunity for design inspiration in the form of interesting earth mounding within adjacent play spaces.

Design coding for play areas in respect of each of the character areas is provided in Section 4.



The design of play spaces should reflect the character and setting of the development.



Figure 3.9 LEAP located in the greenway (see fig 3.8).

3.2 continued:  
**Infrastructure**

**SURFACE WATER DRAINAGE STRATEGY**

The general strategy for surface water drainage is as follows;

Sustainable Drainage Systems (SUDS) will be used extensively throughout the site to reintroduce water into the subsoil, to improve water quality, to reduce flood risk and support biodiversity.

The drainage strategy aims to mimic closely the existing natural runoff. **It is intended that where infiltration rates are suitable all properties in those areas of the site shall drain to local soakaway type infiltration systems (SUDS).** In order to prevent increased flows offsite, surface water control features and storage facilities will be installed prior to any discharge to Pingle Brook or Whitelands Farm Ditch. Thus the basic strategy is for local SUDS and site wide flood protection.

- **Local SUDS will take either the form of soakaways or infiltration trenches, running through one or more properties. These facilities must be designed to accommodate the 10 year storm.**
- **Permeable paving systems together with a permeable sub-base will be used on all streets except Primary and Secondary streets (see figure 3.14 street hierarchy, page 52).**  
The sub-base acts as an infiltration and storage blanket below the paving. **The system will be as shallow as possible and will be adopted by OCC under Section 38 of the Highways Act 1980. These infiltration / storage blankets must be designed for a 10 year storm.**



Grass swale parallel with the highway.

- **Excess flows from the SUDS will be routed via swales or highway drains. These conduits must be designed to prevent surcharged flows encroaching within 300mm of the surface during a 30 year storm.**
- The highway drains and swales lead to the surface water attenuation and storage facilities which are designed to store the excess runoff from a 100 year storm (deductions being made for storage in other sections of the system).
- **The detention facilities shall be located prior to the discharge to either Pingle Brook or Whitelands Farm Ditch.**

Designers should refer to the following documents when commencing detailed design proposals;

- Site Investigation Report – focusing on the line of the primary street and main drainage runs – Whitelands Farm, South West Bicester, Geo-Environmental and Geotechnical Interpretative Report, July 2007. It should be noted that additional site investigations will be required for each development parcel.
- Drainage Strategy Plans 1903/D/06
- Technical Appendix 3a, Flood Risk Assessment, November 2006 – PPG25 Flood Risk Assessment and Proposed Drainage Strategy, dated January 2007
- CIRIA Report 697 – The SUDS Manual, October 2006

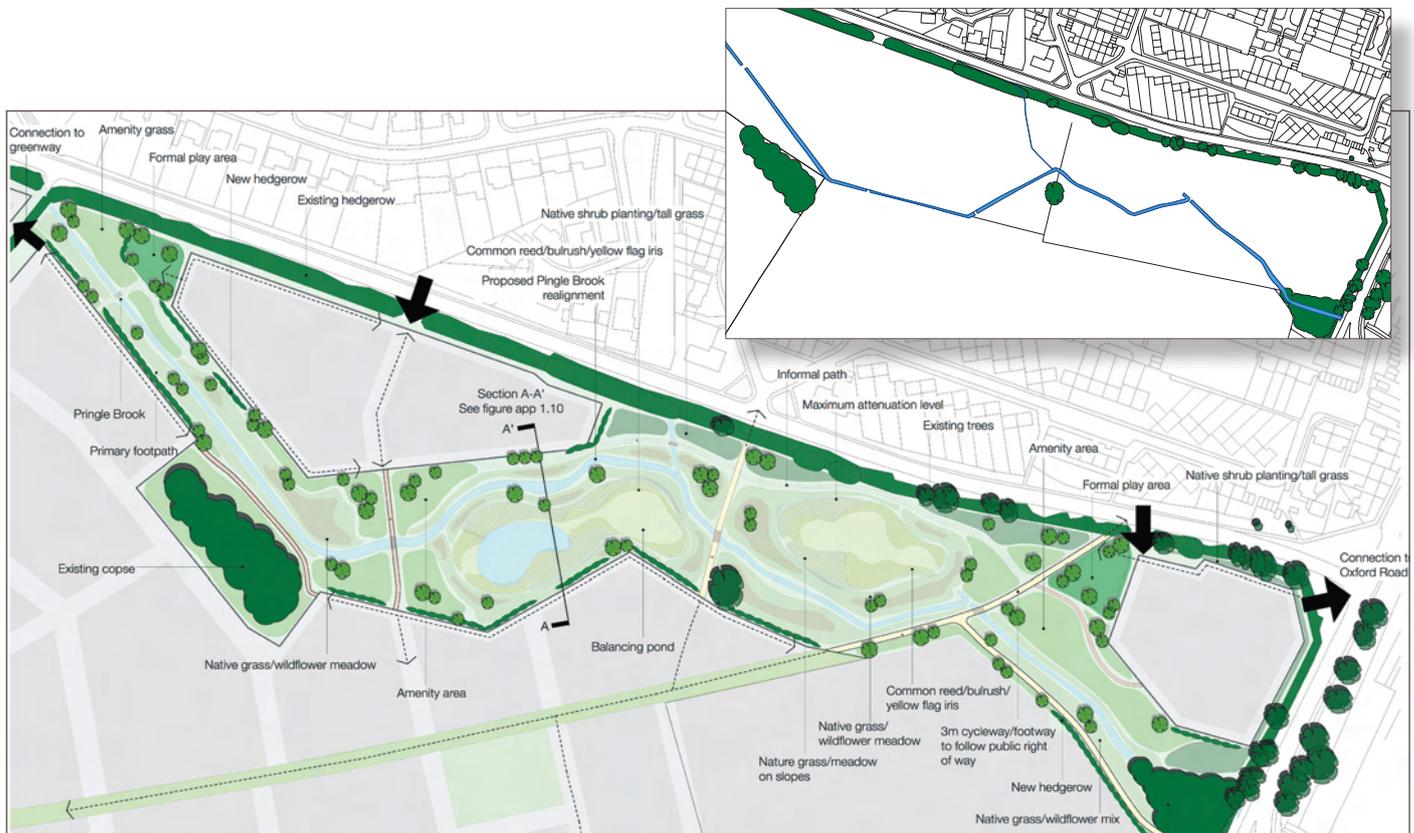


Figure 3.10 Illustrative layout for Pingle Brook (below). Existing plan (inset above).

## SUDS HIERARCHY

The preferred hierarchy is as follows;

- Harvesting rainwater utilising water butts.
- Private on-plot soakaways
- Permeable surfacing with infiltration / storage blankets to driveways, minor estate roads and parking areas.
- Swales to be used as a conveyance and storage mechanism where space is adequate such as verges and open spaces.
- Dry detention basins as final flood protection and water quality facility

Parcel Developers could employ other solutions as shown in table 3.12 Palette of potential SUDS Techniques.

**Priority should be given to the use of soakaways within each property. If infiltration rates are inadequate then attenuation and storage systems should be considered as the next preferred means of source control within the property boundaries.**

Due to the variable infiltration rates across the site in some areas it may be impractical to provide full source control within properties. With prior written agreement of Oxfordshire County Council, and consideration of a commuted sum, Developers will be permitted to discharge some flows from adjacent properties into the infiltration blanket or drains within the carriageway construction. This will only be permitted where the blanket has spare capacity.

Where developers offer permeable paving for adoption, a supplementary commuted sum will be levied to cover additional long term maintenance.

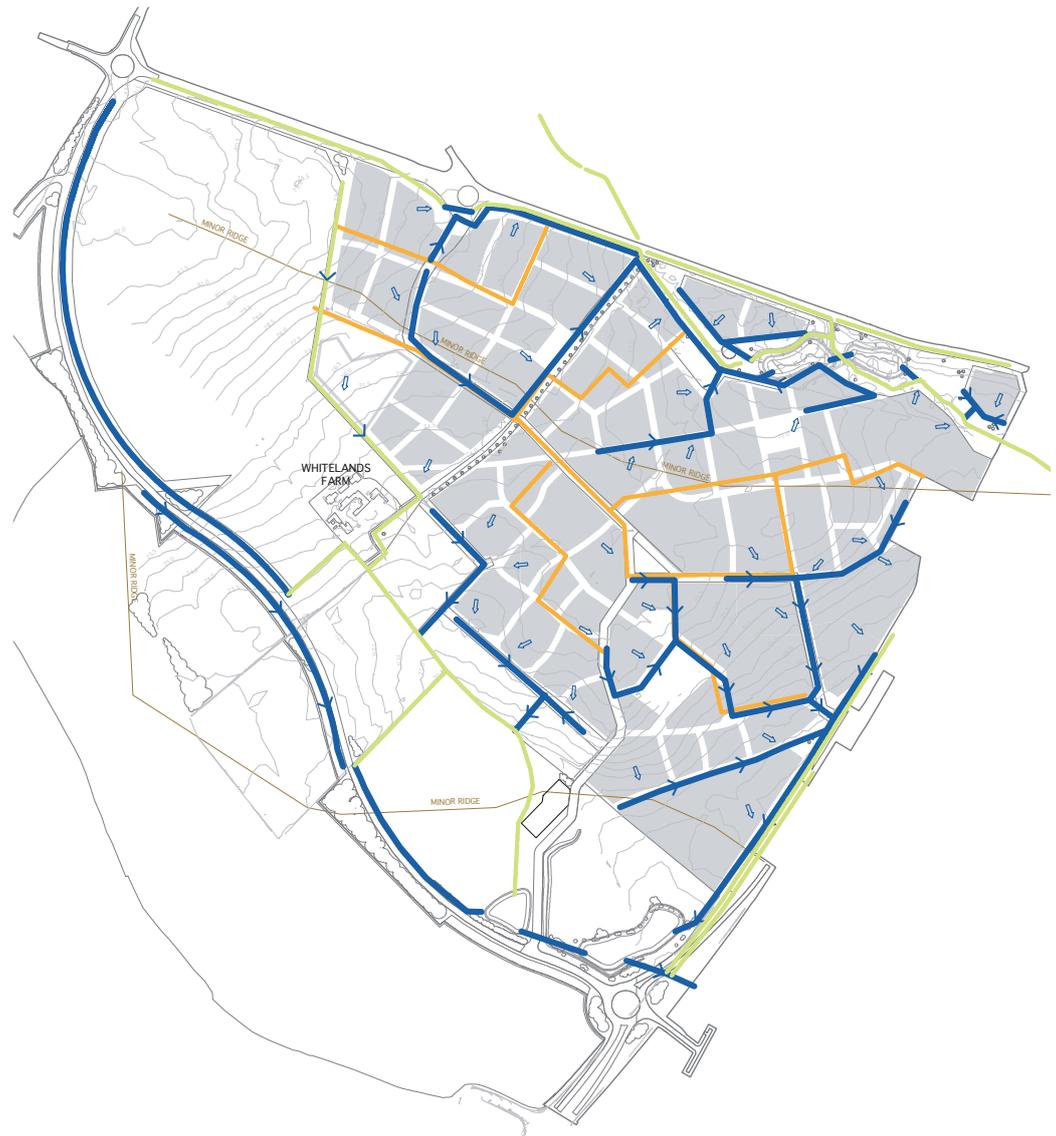


Figure 3.11 Surface water strategy plan.

- Main surface water routes
- Existing, diverted and new open channels
- Sub catchment boundary
- Surface water flows

## EcoHomes

In order to meet the EcoHomes objectives set out in “Chapter 5 Sustainability” parcel developers will need to provide extensive areas of permeable paving and other SUDS. The provision of water butts will contribute to the sustainability rating.

## 3.2 continued:

**Infrastructure****SUDS train**

Due to the variable infiltration rates and nature of the Character areas the train of SUDS techniques will vary across the site. The general principles are as follows;

**Private dwelling areas;**

- Rear of properties – roof drainage to rainwater butts, excess flows to garden soakaways or interconnected linear infiltration trenches through adjacent properties.
- Front of properties – roof drainage to soakaways or via an inspection chamber discharging into the infiltration /storage blanket in the highway;
- Driveways and parking areas to have porous surfacing.
- Excess flows to highway infiltration / storage blanket

**Private dwellings fronting the edge of the development;**

- As elsewhere but discharge to local swales along frontage access route leading to existing or new ditches or watercourses

**Minor streets, mews, country lanes, private drives;**

- Permeable paving with infiltration blanket below. Small contained compartments formed by impermeable barriers increase the storage volumes under gently sloping roads. Limited excess flows are allowed to cascade from one compartment to another until flows become significant and are then discharged to highway drains.

**Construction access roads**

- Impermeable surfacing with, where suitable, infiltration / storage sub base systems discharging to highway drains.

**Secondary streets**

- Impermeable surfacing with, where suitable, infiltration / storage sub base systems discharging via highway drains

**Primary street**

- Impermeable paving with cross falls leading to verge swales or localised infiltration areas with French Drains below discharging to highway drains.

**Highway drains**

- Piped system for excess flows leading to detention basins prior to discharge points to watercourses.

**Perimeter road**

- Impermeable surfacing with no kerbs providing cross fall to swales leading to new ditches. Infiltration French drains where ground conditions are viable.

(See Figure 3.14 for street hierarchy)

**Character areas**

- Avenue – The primary street through the Avenue drains to a central swale / filter trench
- Village – The primary street through the Village drains to infiltration zones in the central reservation interspersed between parking areas.
- Whitelands – The primary street through Whitelands drains to swales / filter trenches alternating from one side of the road to the

other interspersed between parking areas. The sub-soils in Whitelands are generally less permeable thus the scope for infiltration is limited. Permeable paving shall still be used to provide water quality enhancement as well as attenuation and storage.

- Pingle Brook – Where development can not be connected directly to the detention features the SUDS in these areas will need to be designed for 100 year plus climate change flows.

**Non residential areas**

- Schools – Drainage shall follow the guidance in the CIRIA publication “Sustainable Water Management in Schools”
- Commercial – Smaller buildings should follow the principles set out for residential areas. Larger buildings may be considered for rainwater harvesting

**Parking Areas**

- Surfacing should be permeable paving

**Overland Flood routes**

- Routes will generally follow the existing topography and may be routed along proposed streets, cycleways and footpaths. Off-highway routes will be defined by parcel developers to demonstrate that properties will not be at risk of flooding (See page 50 for approvals required).

**Development parcel – Source Control Criteria**

***Each parcel must provide the maximum amount of infiltration as near to source as is reasonably practical. Prior to any design the developer must undertake full scale permeability tests throughout the development parcel to evaluate the infiltration rates across the parcel. Developers must then consult with the EA in advance of design to agree the extent of soakaway and infiltration techniques to be employed on the respective parcel. Generally 100 cu.m of storage should be provided for every hectare of development.***

**Development edge drainage**

Where infiltration rates are viable, properties should discharge surface water to infiltration SUDS within the curtilage (soakaways, permeable drives, etc). As the layout around the development edge will take the form of properties facing outwards – across a footpath/ cycleway/shared drive, etc – where practical it is proposed to position a swale alongside the access route. These swales will in due course connect to the appropriate outfall system.