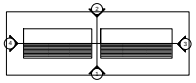
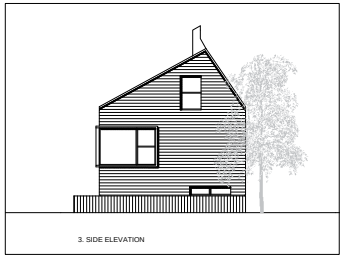
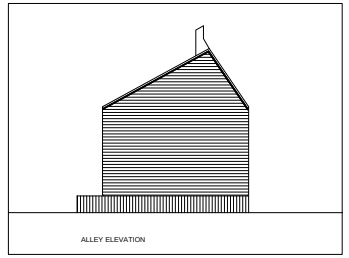
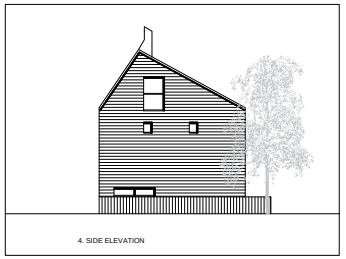
5.14 Appearance: Housing Design and Architectural Language

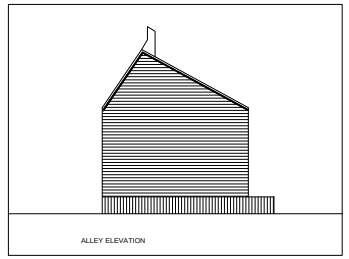
E2_2S_T_L

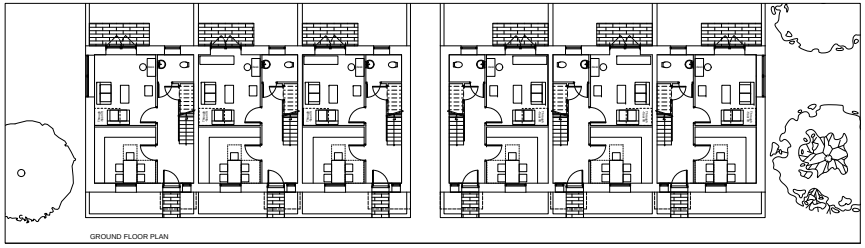


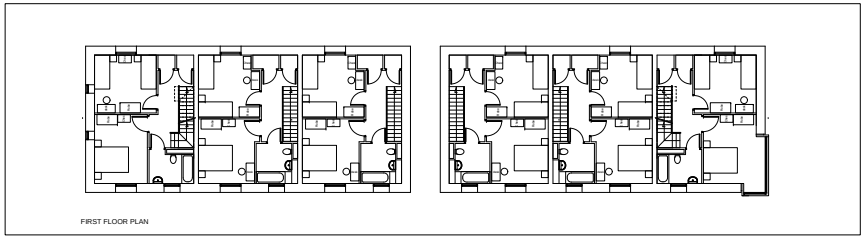


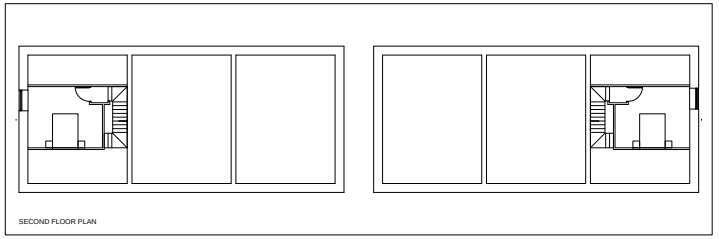








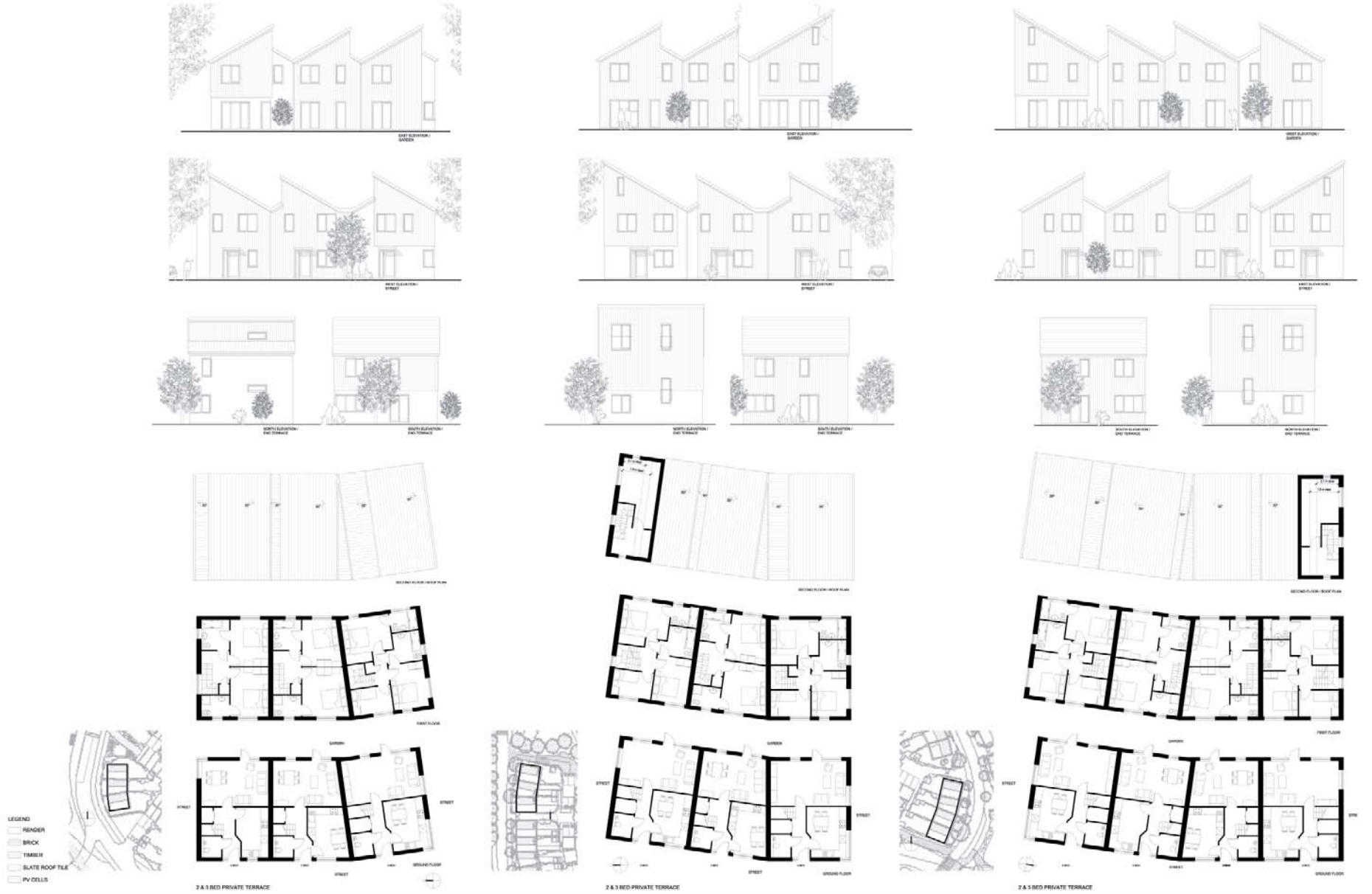




LEGEND

01 STONE
02 BRICKWORK
dark buff colour
03 BRICKWORK
light buff colour
04 HORIZONTAL TIMBER BOARDING
05 VERTICAL TIMBER BOARDING
06 RENDER
07 PV CELLS
08 COMPOSITE WINDOW
outer finish powder coated metal, with head and sill to match
09 STANDING SEAM ZINC ROOF
with powder coated metal gutters and rainwater pipes
10 ROOF VENT
11 METAL CLAD ENTRANCE COVER

5.14 Appearance: Housing Design and Architectural Language



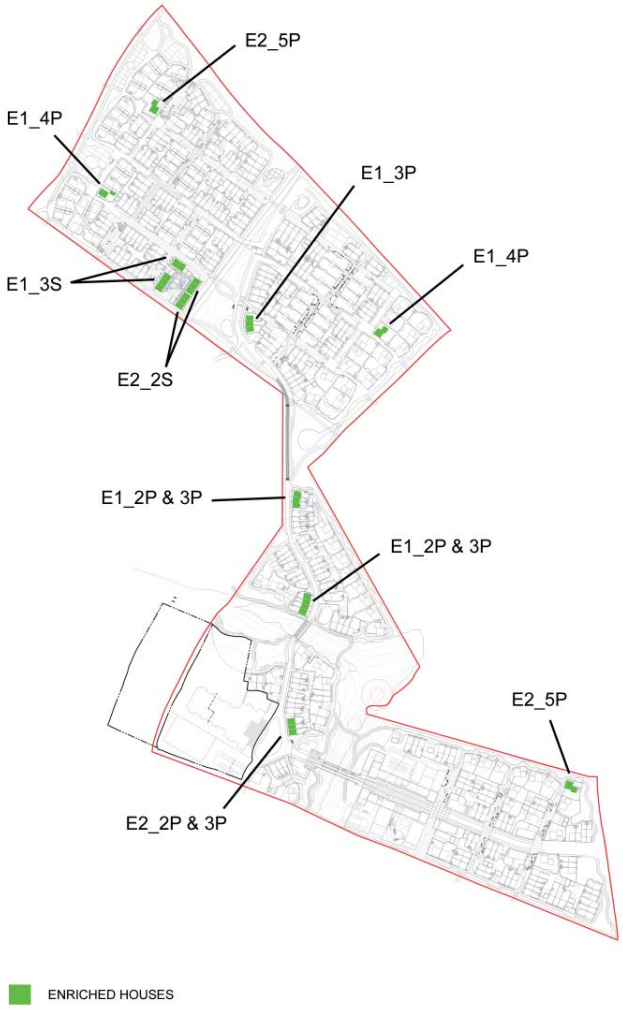
5.14 Appearance: Housing Design and Architectural Language

5.14 Appearance: Housing Design and Architectural Language

The NW Bicester masterplan is conceived as a work of many hands and it is envisaged that the 5000 homes will be delivered by a number of architects. This will generate variety and a richness that a single mind cannot achieve and allow for the investigation of different philosophies and approaches under the umbrella of the masterplan vision. It is appropriate therefore that this approach is represented within the first phase and two residential architects have prepared designs for approximately 30 homes across the layout.

The feature housing is positioned carefully within the layout to mark transition points on the main vehicular route, express significant end of terraces and terminate vistas within the housing areas.

A group of feature housing located in the northern field is proposed as a pilot for a new arrangement of affordable properties gathered around a central communal space with intermediary patio spaces. A2Dominion will monitor the success of this arrangement and consider its inclusion in latter stages.



Feature housing location plan

5.14 Appearance: Housing Design and Architectural Language






Higgs Young Architects' proposals

The feature housing designed by Higgs Young Architects seeks to maximise available roofspace for photovoltaics and creates flexibility by adopting loftspace for home offices. The buldings' forms are driven by an expression of the roofline and respond directly to their orientation. The houses language is derived from a vertical banding of the building frontage and interesting contrast to style one across the layout.

Panter Hudspith's proposal

The designs proposed by Panter Hudspith seek to reduce heat gain and loss by passive means by promoting a thermally massive ground level (to moderate temperatures in active living spaces) and a lightweight first floor level. Allied with internalised shutters and a wind and sun assisted ventilation system the buildings aspire to be economically constructed with locally available materials. The houses have a horizontal expression, but in this instance emphasise the heavyweight base with an exaggerated first floor level.

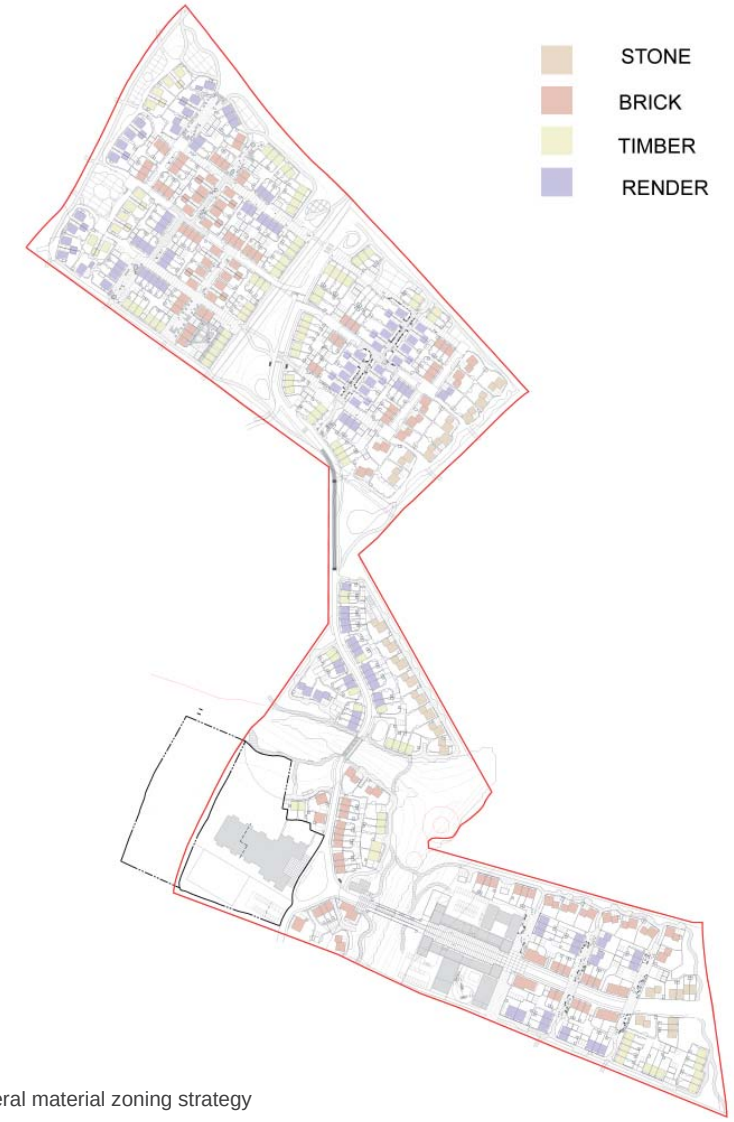
5.14 Appearance: Housing Design and Architectural Language

iv) Materials

Through the development of the housing styles above, a palette of local materials has emerged for each. This has allowed for the opportunity to vary the material of the properties dependant on its location with the layout and its immediate context. The landscape setting has heavily influenced the application of the material palette.

It is therefore proposed that the High Street sequence uses more robust materials like brick but has reconstituted stone to link the residential with the community buildings. A similar approach is adopted fronting Home farm and St Laurence's Church. In contrast the green link, with its swale network and undulating landforms is a softer organic environment and the majority material in this location is therefore timber boarding.

The application of each of the above factors has different consequences on different parts of the first phase and this matrix of variables has created unique settings that are particular and distinct.



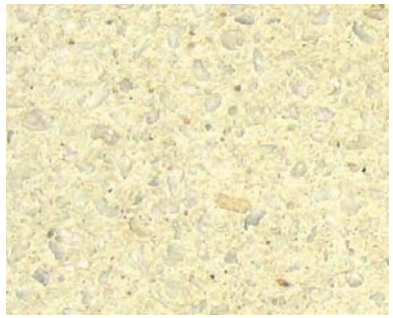
General material zoning strategy

5.15 Materials

Red brick, Flemish bond

Blue brick, Dragface, Stretcher bond

Through colour renders- white, beige and cream, different surface finishes



Reconstituted stone

Slate roof

Timber boarding

A series of visits were undertaken to the town and its surrounding villages creating a photographic precedent study that documented the material palette of the NW Bicester masterplan's context. This has informed the material selection used across the housing in the first phase and seeks to 'ground' the proposals in their surroundings.

The Client has made a commitment to source materials locally where possible.

5.16 Sustainability

To create and enable more sustainable living is at the heart of this development. The PPS 1 Eco-town requirements help facilitate this, however, it is recognised that they can only go so far. Facilitating a step change in the way people interact with the environment, consume and behave are all critical aspects to achieve a more sustainable way of living.

That is why, alongside the design process and technical approaches, many of the measures proposed are aimed at improving the social capital of the development; and involve community engagement and education as to how individual and group choices can make a positive impact. For example, by providing allotments, a community centre, an education programme and a thriving governance body; the community will be able to develop a programme for reducing the impacts of food miles, packaging and food wastage.

Please refer to the 'Sustainability Statement', produced by Hyder that forms part of this application, for further information on the series of vision statements and proposed measures that form the holistic approach to sustainability within the Exemplar. The information below summarises the approach to Sustainable Development Design.

Creating a sense of place and attractive buildings people want to live and work in is vital to creating a sustainable community. Key elements that have been developed and will be included within the development include:

- All residential homes are built to Code to Sustainable Homes level 5 and commercial /public building built to BREEAM Excellent.
- Provide a mix of housing types, tenures and layouts that meet the needs of local andincoming residents, and the requirements of the local housing market. Provide 30%affordable housing, including rented and shared equity.
- Design buildings that will be comfortable to live and work in, both now and in the future,taking account of potential climatic change including overheating.
- To create a sense of place through both layout and distinct house design.
- The layout and design integrates green space within the development, to provide an attractive, safe and natural environment that promotes health and community living.
- All homes are orientated to take advantage of solar power, able to achieve at least 90% efficiency relative to photovoltaic panels.
- Promote local sourcing of materials and labour, and seek to specific materials with high rating in the BRE Green Guide to Specification, which seeks to minimise the carbonfootprint of materials. Ensure that all timber used is sourced from FSC.

6 LANDSCAPING

6.1 LANDSCAPING

The landscape strategy set out for the NW Bicester eco development Exemplar site is sensitive to the local landscape character, responsive to the existing green infrastructure (GI) and the limited valuable habitats present. PPS1 sets out the core guidance and guidance for Eco-Towns, including requirements for green infrastructure.

Biodiversity has been a key consideration in the design of the green infrastructure from the outset, rooted in the retention of existing hedgerows, even those not identified as species rich, and the river corridor environs. The phase 1 habitat surveys provided valuable early warning of potentially species and habitats and have been used to inform the design layout and landscape strategy. Although the extended phase 1 habitat survey data has only recently been received (November 2010) it has not identified any additional significant species or habitats beyond that already identified much earlier in the design process. In addition the Biodiversity Workstream has been invaluable in contributing to the emerging Biodiversity Strategy and Green infrastructure proposals.

Green Infrastructure is a strategically planned and delivered network of quality green spaces and environmental features. It threads through and surrounding the built environment, respecting and enhancing the distinctiveness and character of habitats and landscape types while supporting and sustaining natural and ecological processes and the quality of life and health of the community, including play provision. The guidance indicates that 40% of the area of an Eco-Town should be green infrastructure, 20% of which should be publicly accessible. Guidance also advocates that GI should, as far as possible, be multi-functional, a principle which has also been applied to the design of the Exemplar site.

Landscape Character

As part of the landscape assessment and design process for the wider Bicester eco development masterplan, Hyder has prepared a landscape character assessment based on the principles set out in 'Landscape Character Assessment Guidance for England and Scotland', produced by the Countryside Agency and Scottish Natural Heritage, in 2002. This landscape character assessment (see Hyder's Site Landscape Character Assessment dated 18th August 2010) provides the landscape context for the wider Bicester eco development Masterplan site area, which includes the exemplar site. The latter falls within the Caversfield Valleys and Ridges landscape character area, typified by mixed farmland on ridges, with a strong field pattern bounded by established hedgerows and woodland blocks. This arrangement generally provides a strong sense of enclosure due to characteristic landform, vegetation and settlement edges.

The Oxfordshire Wildlife and Landscape Study (2004), places the site within 'Wooded Estatelands' Landscape Character Type, with the following key characteristics:

'Rolling topography with localised steep slopes.

Large blocks of ancient woodland and mixed plantations of variable sizes.

Large parklands and mansion houses.

A regularly shaped field pattern dominated by arable fields.

Small villages with strong vernacular character.'

This is a well-wooded landscape with blocks of woodland and corridors of trees bordering valley streams. Fields are generally enclosed by hedgerows, with established ash and oak hedgerow trees also contributing to the wooded character of the landscape. The surrounding agricultural land is generally characterised by a geometric pattern of medium to large fields. In summary, the merits of the exemplar site are:

- Gently rolling landform, characterised with species-rich hedgerows
- Biodiverse river corridor
- Cultural Heritage, Architectural and Landscape Vernacular
- Strong agrarian grid and field pattern used to compartmentalise site development areas

Palimpsest

It is important that the exemplar site will present a sequence of memorable spaces for visitors and residents alike, that respect the cultural and natural history of the locally distinctive landscape. Characterised by hedgerows, scattered trees and occasional woodland copses much of which is associated with 18th Century parkland, the site perimeter is mostly defined by existing hedgerows.
The landscape design seeks to reveal these layers of history through safeguarding where possible and through juxtaposing these with new and contemporary opportunities.

Conceptual Origins

It is important to note that the layout design and landscape design share a common conceptual origin, based on the above, expressing a collective story of how the layout and the landscape have been developed iteratively, from Terry Farrell Associates earlier work as a starting block (endorsed by all) which set out a number of design principles. The underpinning design principle was the use of the geometry of the field pattern in the layout design.

Place making and quality of environment is an integral element of the design. The root concept for the landscape design of the exemplar site is, where possible, to preserve and enhance the existing green infrastructure, site topography, hydrology and key ecological and cultural assets. The strong agrarian grid inherent in the field pattern, (especially in the north area), is defined by existing hedgerows. These are a critical element of the landscape structure here. Predominantly these have been retained in the proposed scheme to positively influence the layout and orientation of the proposed built form, sympathetically, on broadly the same grid pattern. Many of the hedgerows are also rich in biodiversity and, together with the local river corridors and associated habitat, are the primary ecological asset.

The landscape sensitivity and capacity to accommodate development is a key formative factor in the proposed layout and the landscape design, largely by augmenting the existing green infrastructure and mitigating sensitive views from the nearby setting of St Lawrence's Church and Home Farm by the use of planting buffers.

6.1 LANDSCAPING

Landscape Design Principles

The following design principles have been applied to the proposed landscape structure of the exemplar site, all of which are wholly complimentary to the landscape character and merits of the site (see below) and have informed the conceptual origins of the layout:

- Gently rolling landform, characterised with species-rich hedgerows
- Biodiverse river corridor
- Cultural Heritage, Architectural and Landscape Vernacular
- Strong agrarian grid and field pattern used to compartmentalise site development areas

- retain and enhance existing Green Infrastructure, improving green links through and contextual connectivity
- improve biodiversity through better management and habitat creation
- integrate SuDS, Green Corridors, Cycleways and Community Routes
- create a variety of open spaces (soft and hard / green and grey) and public amenity space
- create a new Village Centre maximising relationship with the River Bure corridor
- maximise retention of species-rich hedgerows, woodland planting and specimen trees
- improve riparian corridor and create areas of new biodiverse wetland
- provide natural play areas including LEAPS and NEAPS to cater for all age groups
- provide a lighting strategy that is mindful of Secured by Design and public safety while remaining sensitive to wildlife (eg bat feeding corridors)
- provide productive, edible landscape through allotment and community gardens and natural foraging areas, including within homezones and school grounds

Site Zoning

Typical of the wider landscape character (described above) the merits of the exemplar site are:

- Gently rolling landform, characterised with species-rich hedgerows
- Biodiverse river corridor
- Cultural Heritage, Architectural and Landscape Vernacular
- Strong agrarian grid and field pattern used to compartmentalise site development areas

Within this landscape structure the exemplar layout proposed can be broadly described as five distinct zones:

1. North Fields
2. River Corridors
3. Non-Residential Core
4. South Field
5. Edges

North Fields – The safeguarding of the strong field pattern and hedgerows here is integral to the proposed layout. Since the early Farrell's concept of the 'green link' the iterative design process has resulted in this being moved from the north west corner of the site to a central location adjacent to the retained middle hedgerow and proposed primary route. This is the primary multifunctional greenspace for the north site area, containing swales, public amenity ponds, new aquatic, marginal and dry habitats, an orchard, and a natural play areas. It is a strong physical extension of the greenery into the site from the north and provide a green umbilical cord as it broadens toward the southern part of the site.
Pedestrian paths along the site perimeter here connect to homezones within the layout and also offer permeability to future phases of the Masterplan.

River Corridors – This area includes the residential layout to the immediate north of the river corridors. By agreement through the 'Biodiversity Workstream' the north / south river corridor has been designed as riparian and wooded, and accommodating a NEAP. A series of footpaths would provide links and circular walks within this corridor. This is the primary greenspace in the southern part of the site. The east / west river corridor has been designed as a marginal or temporal grassland habitat with scattered trees, to promote habitat variety and improve foraging areas for birds and other wildlife. This is where a main badger set is located so public access to will be limited.

Non-Residential Core – The non-residential core is laid out along the primary east / west route, either side of the proposed bridge. On the west side the proposed primary school grounds includes sports pitches, open space and a perimeter nature trail. The traditions of a village green opposite the school have been adapted to incorporate a LEAP, fitting by proximity to the school.

The village 'high street' public realm is sensitively designed as a high quality environment and village retail square, accommodating through traffic and servicing access to the rear of shops and facilities. The proposed shared surface arrangement is consciously designed to reduce traffic speeds and promote free movement of pedestrian and cycle users. The character and footprint of the village high street extends across the proposed Bure Bridge to the other side adjacent to the proposed eco-pub. It is important that the reach of the village high street extends to the west side of the bridge, treating this space at the community route crossing point with equal importance.

South Field – Similar to the layout in the north fields, here the influence of the agrarian grid is again used to inform the housing layout. Being closest to Bicester town the character of the layout here is subtly more 'urban' and the north / south homezone axes that 'cross' the east / west spine lane borrow and compliment the proposed design pattern and character of the village high street public realm.

6.1 LANDSCAPING

Edges – The treatment of the perimeter of the proposed plan has been considered from the outset. The landscape and visual impact assessment and constraints plan identified where landscape mitigation buffers would be required to mitigate sensitive views. These buffers include allotments, biodiversity, planting and movement corridors.

Street Hierarchy
Route hierarchy has been carefully considered in the design development of the layout, and against Manual for Streets and MFS2. Generally, in relation to vehicular traffic, the road system will be designed to control vehicle speeds for the benefit of road safety. The provision of social infrastructure will also promote social interaction that will benefit overall well-being. It has therefore been vital to design as many streets as possible as homezones, with the primary route being a country spine lane.

The streets are arranged to reflect a simple but rich sequential experience, becoming increasingly pedestrian dominant toward the edge of the site and on north / south link spaces where possible, but all areas of the spine lane would be treated as homezones.

A change in surface materials to distinguish the homezones / edge environs of the block layout is encouraged in accordance with OCC's Street Design Manual. Resin bonded gravel or contemporary forms of 'grass paving' (such as golpa block or fibre-turf) might be suitable in some locations to create a distinctive and inviting character.

Spine Lane (Primary Route)
The primary route through the site will be akin to a country lane in proportions and character. This route runs north / south. Large street trees, equally spaced, will help to distinguish the primary route.

Classic Homezones (Woonerf - Secondary Routes)
(See Green Infrastructure Typology, below)

Exemplar Homezones (Tertiary Routes)
(See Green Infrastructure Typology, below)

6.1 LANDSCAPING

Green Infrastructure

In considering the green infrastructure and landscape strategy reference to the following guidance has been made, amongst others:

- eco- towns : A Supplement to Planning Policy Statement 1
- Natural England's Green Infrastructure Guidance
- TCPA's Green Infrastructure Worksheet
- The Landscape Institute Green Infrastructure Position Statement
- Secured by Design and Manual for Streets 1 and 2
- CABE's Open Space Strategies
- Cherwell Recreational Strategy 2007-2012
- Hyder's Landscape Character Assessment of the Exemplar Site

The retention and enhancement of existing Green Infrastructure and biodiversity, improving green links, contextual and habitat connectivity, have been key considerations in the integrity of the proposed landscape structure.

The design layout provides a Green Infrastructure over 44%, with public GI of 37%. This includes some homezone areas in accordance with GI guidance, but by no means all (see below for further details). These figures do not account for the potential and likely contribution that back gardens could offer to the overall GI.
Importantly, the existing landscape features of greatest biodiversity are the hedgerows, which have been retained and augmented with supporting habitat and management. They form a skeletal framework for the green infrastructure, together with the river corridors and local topography. The landscape infrastructure is designed in sympathy with the local landscape character, but also incorporates the philosophy of minimising dominance of cars by claiming streets for people and creating extensive areas homezones (see below).

Green Infrastructure provision on the exemplar site should be considered in context of Bicester's existing green spaces and links, and the planned future provision of the GI on the wider Masterplan site.

Proposed Green Infrastructure typologies for the Exemplar site are as follows:

Hedgerows / Buffers

The retention of species-rich hedgerows and specimen trees has been maximized, being the most important existing land cover and terrestrial habitat corridors. It is proposed to augment the hedgerows by creating a new and adjacent habitat. For example a minimum 3m rough grass 'buffer zone' against hedgerows as a new supporting habitat to improve biodiversity. This grass zone protects the roots of the trees and shrubs in the hedgerows and creates an open area adjacent to the hedgerow of benefit to fauna.

Wide buffers are particularly important where the hedgerows support trees, but there are few, if any, mature trees within the existing hedgerows on the exemplar site. New wider and more diverse buffer areas have been incorporated with other areas of open space or landscape features alongside the hedgerows, such as areas of tree and shrub planting, woodland copses, allotments and SuDS features. These additional habitats add to the diversity of habitat conditions in proximity to the hedgerows. They ensure that significant corridors that allow for the movement of wildlife across the site are maintained. Incorporating the other landscape and SuDS features into areas close to the hedgerows enhances the value of these features for wildlife. Proposed supporting structure planting and habitats that have been located close to the hedgerows will not be lit and thus maintaining dark corridors suitable for nocturnal fauna including light sensitive bat species. (see Lighting).

By design, all breaks in existing hedgerows have been kept to a minimum to maximize continuity of associated feeding corridors (such as for bats) and visual enclosure. Through collaboration with Oxfordshire County Council streets have been kept to a minimum width at break points. All sections of hedgerow to be removed to accommodate the development footprint will be translocated within the site to form part of the green infrastructure elsewhere, supplemented with new planting where necessary.

River & Riparian Corridors

The river and riparian corridors, (the Bure, running north / south and its tributary running east / west) in the southern area of the exemplar site offer topographical variation, wet and ephemeral habitat and diversity within the green infrastructure and a rich landscape experience.

However, there is significant scope to improve the quality of these corridors to benefit existing habitats and enjoyment by future users. Careful creation of areas of new biodiverse wetland, using scrapes and small perched ponds will be included within the riparian corridor. By agreement through the 'Biodiversity Workstream' the Bure river corridor has been designed as riparian and wooded to enhance it's existing habitat, and accommodating a NEAP. A series of footpaths would provide links and circular walks within this corridor. This is the primary greenspace in the southern part of the site. The east / west tributary corridor has been designed as a marginal / emphemeral grassland habitat with scattered trees. This is where a main badger set is located so public access to will be limited. Together the proposed enhancement of these river corridors will offer a more diverse habitat mosaic and create a strong 'green lung' in the heart of the development for recreation and amenity.

6.1 LANDSCAPING

Green Link

This is the primary multifunctional green space in the north fields. It is a collection of green space functions, anchored by the existing retained hedgerow to the west, which offers strong compartmentalization of the development layout. From the north entrance to the site the 'green link' flanks the spine lane, providing a strong visual amenity setting for the exemplar site within its rural context.

The safeguarding of the strong field pattern and hedgerows here is integral to the proposed layout. Since the early Farrell's concept of the 'green link' the iterative design process has resulted in this being moved from the north west corner of the site to a central location adjacent to the retained middle hedgerow and proposed spine lane. The 'green link' contains swales, public amenity space, ponds / bogs, new aquatic, marginal and dry habitats, orchard planting, and both a LEAP and an Enhanced LEAP(see Natural Play / Recreation). It is a strong physical extension of the greenery into the site from the north and provides a green umbilical cord as it broadens toward the southern part of the site. Pedestrian paths along the site perimeter here connect to homezones within the layout and also offer permeability to future phases of the Masterplan.

Natural Play / Recreation

Natural play and recreation areas including LEAPs and a NEAP cater for all age groups, and disabled users in accordance with CDC and national guidance. The incorporation of LEAPs,a NEAP and play environments within exemplar homezones, as an integral part of the green infrastructure, will encourage children and young people to interact with their environment and use the landscape for creative learning activity. CDC have encouraged and endorsed LEAPs and a NEAP without formal play equipment, which will encourage greater levels of imaginative play. LEAPs have been designed to include natural play environments for younger children and consist of a variety of stimuli, such as varied surface textures, low and gentle landform, child sized 'doorways', floor or hedge mazes, shallow rills that fill with surface water following rainfall, and edible plants.

Proposed provision is as follows:

1. Neighbourhood Equipped Area for Play (NEAP -Adjacent to River Bure corridor)
Spatial provision included for the 465m2 requirement for ball games, but proposed grass surface not hard surface & 8+ items of 'play equipment' (green gym). 30m buffer to boundary of residential properties.
The NEAP has been designed for all age groups, and includes seating areas, level space for ball games, trim trail, green gym with proprietary 'natural' and timber low key installations, dexterity challenges (e.g. timber posts), natural shelters, etc.

2. Enhanced Local Equipped Area for Play (Enhanced LEAP – in 'Green Link')
This area has been designed to be as flexible and green as possible, using reinforced turf (rather than an artificial surface) and a demarked games fence / kick wall / games wall at one end and to accommodate the equivalent space for a Multi Use Games Area (MUGA) footprint. As with the NEAP in the south, this has been designed to be an integral element of the landscape, complete with green gym / younger children's play items around the periphery and integrated buffers / biodiversity and access for all.
10m buffer for LEAP to boundary of residential properties – compliant.
8 items of 'play equipment' provided + natural play areas included

3. Local Equipped Area for Play 1 (LEAP 1 – near School)
Appropriately sited adjacent to the school this is envisaged to be well used, safeguarded by a low railing to the perimeter.
Approx 5 items of 'play equipment' provided and natural play areas.
10m buffer for LEAP to boundary of residential properties.

4. Local Equipped Area for Play 2 (LEAP 2 – near north site entrance)
Maximising use of the sub surface SuDS storage tank water resource by (micro renewable energy pump feed) and using the local topography this location incorporates a local 'scrape' to create a shallow bog habitat to assist natural play and education 10m buffer for LEAP to boundary of residential properties. Approx 5 items of 'play equipment' provided and natural play areas.

5. Exemplar Homezone Play Environments
Exemplar Homezones will be designed to provide flexible environments to encourage young play, including demarked or subtle surface pavement patterns and textures (for hopscotch, etc). This is a subtle but locally important contribution to play provision, particularly for young children.

School Green Space

Within the school curtilage provision is made for hard and soft play areas. Importantly, the perimeter of the school grounds offers opportunities for a nature trail and learning through landscapes. In particular the area adjacent to the Bure tributary to the north is on the edge of the Badger Set foraging ground, and it may be suitable here to introduce an orchard and rough grassland areas for children to learn and play.

6.1 LANDSCAPING

Sustainable Urban Drainage Systems (SuDS) / Swales

SuDS have been incorporated into the landscape design from the outset to mitigate flood risk from surface water, comprising a system of devices designed to manage both the quality and quantity of surface water runoff, whilst providing biodiversity habitat creation and public amenity.

The SUDS strategy is based on discharge via ground infiltration alone, wherever possible, minimising surface water discharges to nearby watercourses and the risk of surface water flooding. Soakaways have not been considered as feasible in areas of shallow impermeable stratum such as rock or clay. At such locations, surface water runoff would be stored in suitable attenuation structures such as basins and discharged to local watercourses at controlled rates.

Treatment trains have been formed using individual SUDS features to form a chain, each having a variety of attributes and strengths, which have been linked to complement one another to provide the required balance of storage and treatment.

Each property would incorporate a subsurface combined rainwater harvesting and soakaway system within the curtilage. Rainfall would be retained within the rainwater harvesting tank, ready for future reuse within the property, significantly reducing demand on the potable water network. Excess rainwater would discharge to a soakaway structure. Commercial property, the school and other large properties would allow use of a wider range of storage techniques including basins, ponds and other soakaways within open areas.

At locations where shallow impermeable strata prevent the use of a soakaway, excess rainwater within the rainwater harvesting tank would discharge by pipe to a basin, pond or subsurface storage structure nearby via a local pipe network, discharging via pipework to a nearby watercourse at a controlled rate to ensure site discharges remain at greenfield rates.

Basins would incorporate relatively small channels and wetland areas to provide storage for regular rainfall events, whilst a larger area would be provided for inundation during highly infrequent events, allowing the area to be used for amenity with inundation typically once every few years for twelve hours. Ponds would incorporate a permanent water body, and incorporate sufficient volume to store additional rainfall prior to controlled discharge to a nearby watercourse. Ponds and basins would have a minimum of 1:3 slopes to facilitate maintenance, whilst the incorporation of gentle slopes would also provide conditions for wetland / marginal habitat creation to count toward biodiversity net gain. The depth of each pond or basin would respond to the site topography and incoming pipe networks. True swales are limited in number / length. The only proposed swales are in the 'green link' (green corridor) in the north area of the site.

Adopted roads within the site would drain via a mixture of permeable paving, swales and channel features, discharging to the ground or to ponds or subsurface storage to a watercourse. Private roads, parking and other areas of paving would drain surface water via permeable block paving. Typical features include:

Narrow, relatively deep, vertically faced channels formed within the paved area, the base of which would be permeable and the sides formed using suitable impermeable material such as concrete. A grill near the surface would provide a resilient surface through which would protrude vegetation such as reeds planted in the base.

Infiltration trenches comprising an excavation with permeable base and backfilled with granular filter material to provide storage and planting medium, allowing infiltration through the base and sides.

By designing in modest surface channels at specific locations, surface water runoff can be conveyed to supply swales and ponds. There is an opportunity for these features to animate space during and following precipitation (see also Natural Play / Recreation).

Classic Homezones (Woonerf)

These routes predominantly run east/ west and feature classic Dutch Woonerf design principles, such as staggered on street parking to create chicanes to reduce traffic speeds and areas of broadened pedestrian space. These routes will mostly accommodate two-way traffic movements. Small street trees in geometric groups would help to distinguish these homezones, located between occasional on street parking (OCC require only 1 car parking space per 4 / 5 units).

Exemplar Homezones (Incl. Play Environs)

These are enhanced homezones convey the character and spatial qualities of exemplar homezone design, befitting of an eco development.

Typically these are aligned north / south at the periphery of the site, organic in layout and serving only a small number of units. Importantly they have been identified as areas where vehicle access is minimal and usually one way in and out. Clusters of natural tree planting can help characterise these as living streets, and shared surface design will incorporate detailed SuDS features such as narrow shallow rills to animate street space during and following downpours.

Minimal access for vehicles is accommodated but thereby offering much of the shared street for communal spaces such as raised decks, seating, raised planters to support trees, and strong pedestrian and cycle links through to good permeability connections to surrounding footways. 'Sheltered' play environments are incorporated to wholly encourage young children to occupy and claim the homezone as their immediate outdoor natural play realm.

6.1 LANDSCAPING

Community Growing / Allotments

The landscape planting strategy, as far as practicable, is for a productive, edible landscape through allotment and community gardens and natural foraging areas, using either native species or cultivars of natives.

CDC requirement is for 0.31 hectares of allotments per 1,000. There is a designed 0.46 hectares of allotment provision against an assumed1,024 people (based on 394 units at a general assumption of 2.6 people per unit). Local food production has been considered from the outset, and in addition to allotment provision there are localised orchards, natural foraging areas and a wider aspiration for a productive natural, edible landscape. All of this has the potential for a collective social enterprise or local market garden which could be expanded with additional phases of the Masterplan area.

Allotments have been designed with a low hedge and hedge trees surrounding each group of allotments, as agreed with CDC as a fitting alternative to a security fence. Allotment provision is intentionally dispersed across the site, though always with an aspect to the south or east of existing hedgerows to maximize natural light to aid food production.

Connectivity and Permeability

Route hierarchy has been carefully considered in the design development of the layout, and against Manual for Streets and Manual for Streets 2. Generally, in relation to vehicular traffic, the road system will be designed to control vehicle speeds for the benefit of road safety. The provision of social infrastructure will also promote social interaction that will benefit overall well-being. It has therefore been vital to design as many streets as possible as homezones or at least with some homezone design principles.

The streets are arranged to reflect a simple but rich sequential experience, becoming increasingly pedestrian dominant toward the edge of the site and on north / south link spaces where possible.

A change in surface materials (ideally in relation to a change in housing typology) to distinguish the homezones / edge environs of the block layout is encouraged in accordance with OCC's Street Design Manual. Resin bonded gravel or contemporary forms of 'grass paving' (such as golpa block or fibre-turf) might be suitable in some locations to create a distinctive and inviting character.

Lighting

The lighting strategy is simple and reinforces the proposed route hierarchy, thereby strengthening character, minimizing light pollution and ensuring secured by design for primary routes. It is important to note that CDC and the representatives of the 'Biodiversity Workstream' have requested that areas of GI (and habitats within) are retained as unlit corridors to benefit biodiversity and nocturnal foraging. This has been accommodated ,as far as practicable, within the green link, the perimeter hedgerows and buffers and the river corridors.

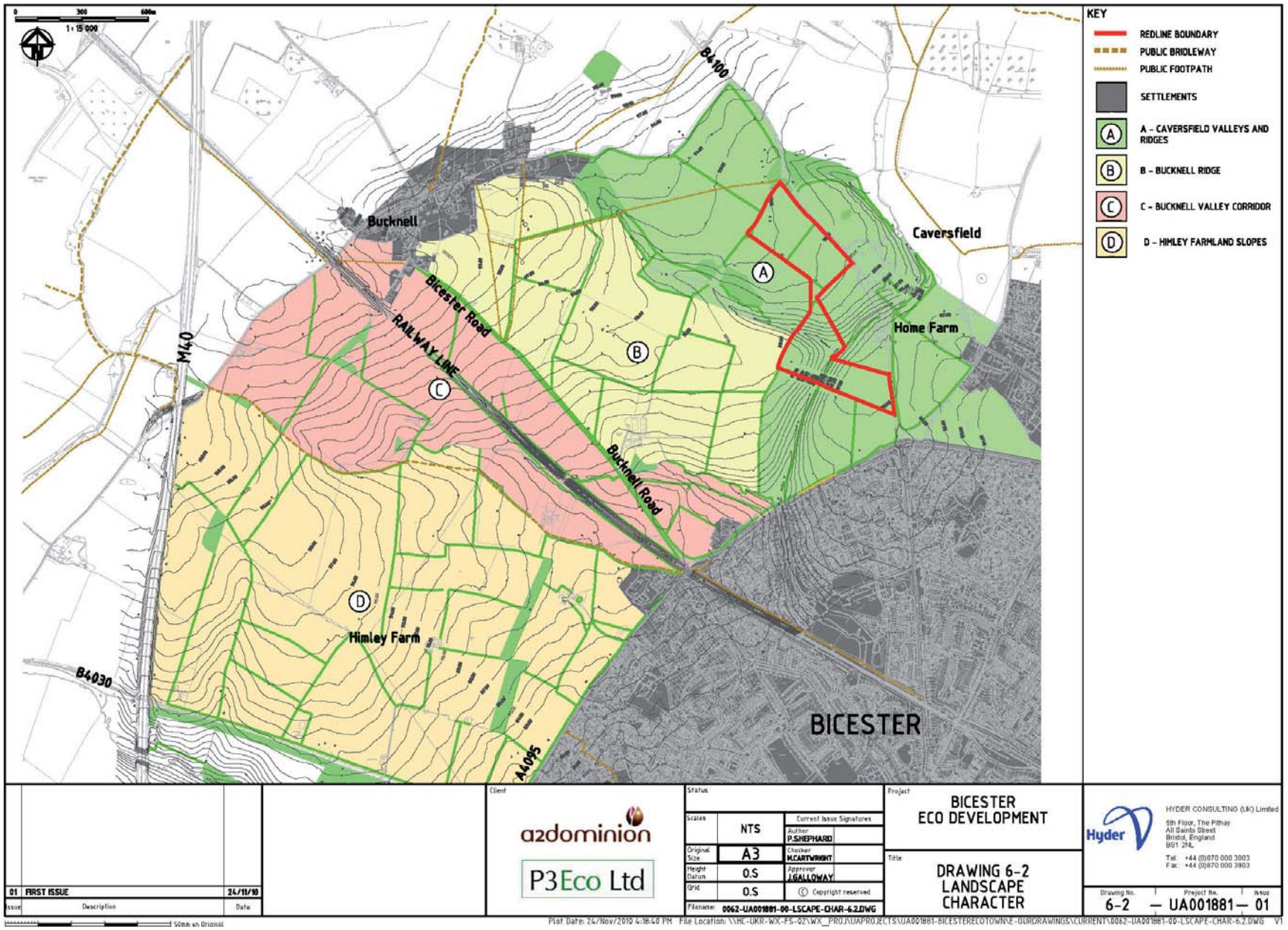
Against BS5489 & BSEN13201, CE2 (8m columns) category has been applied for the spine lane and village centre. Within classic homezones and minor access ways category S7 (5m columns) has been applied. Within exemplar homezone areas lighting class S7 incorporating 5m columns supplemented by building mounted luminaires and bollard or ground lighting is proposed. In addition the village centre would benefit from some feature lighting to render building facades

Summary

The creation of well connected, good quality open spaces and public amenity space including recreation is a key ingredient to the success of the exemplar layout. It is an integral part of the green infrastructure. The Exemplar Site includes the provision of attractive and safe walking and cycling routes which will help reduce the need to travel by vehicle and support the pursuit of healthy lifestyles. Access to open space and play areas is also achieved through the green infrastructure strategy for the site.

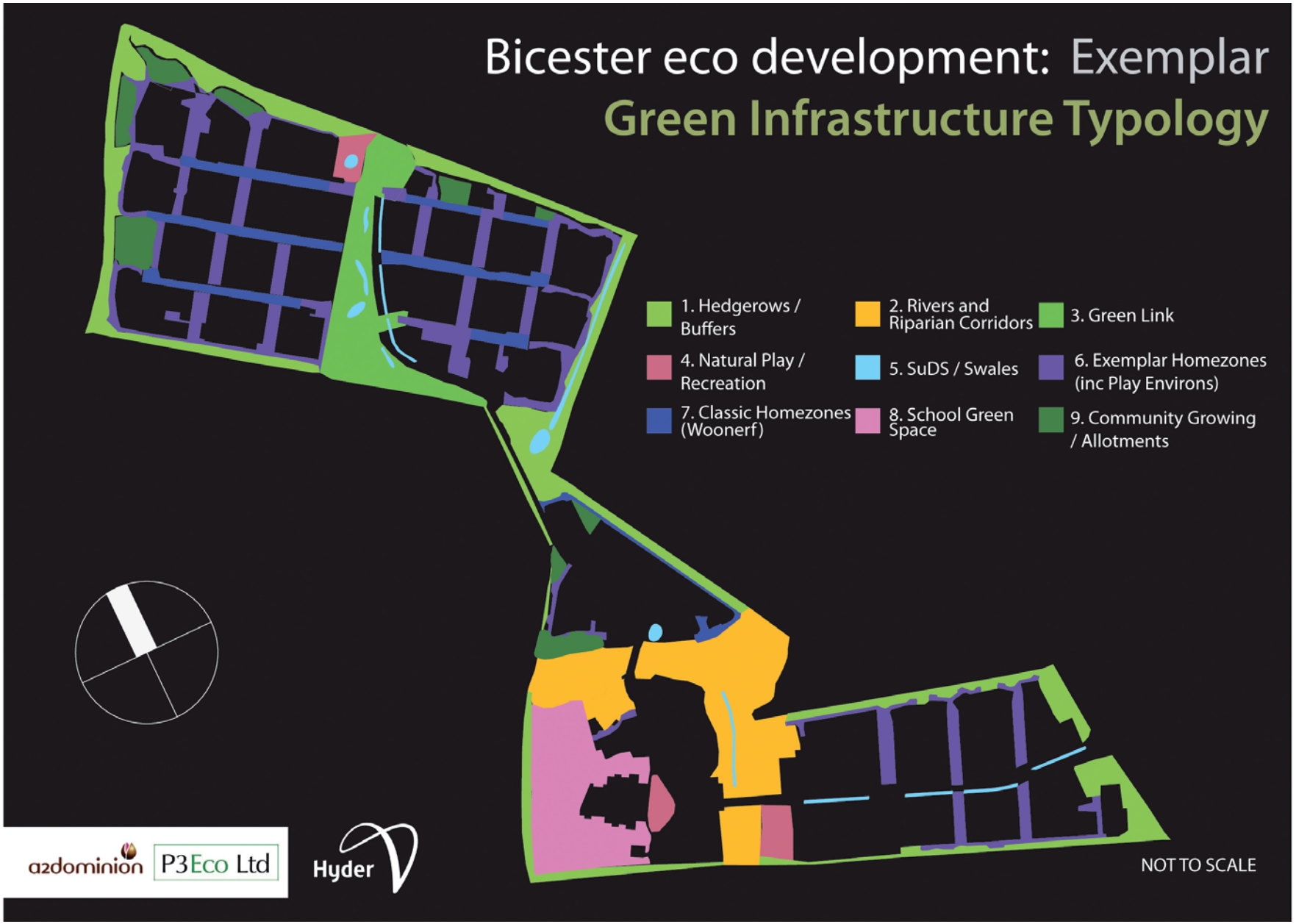
See appendix for species guide.

6.1 LANDSCAPING



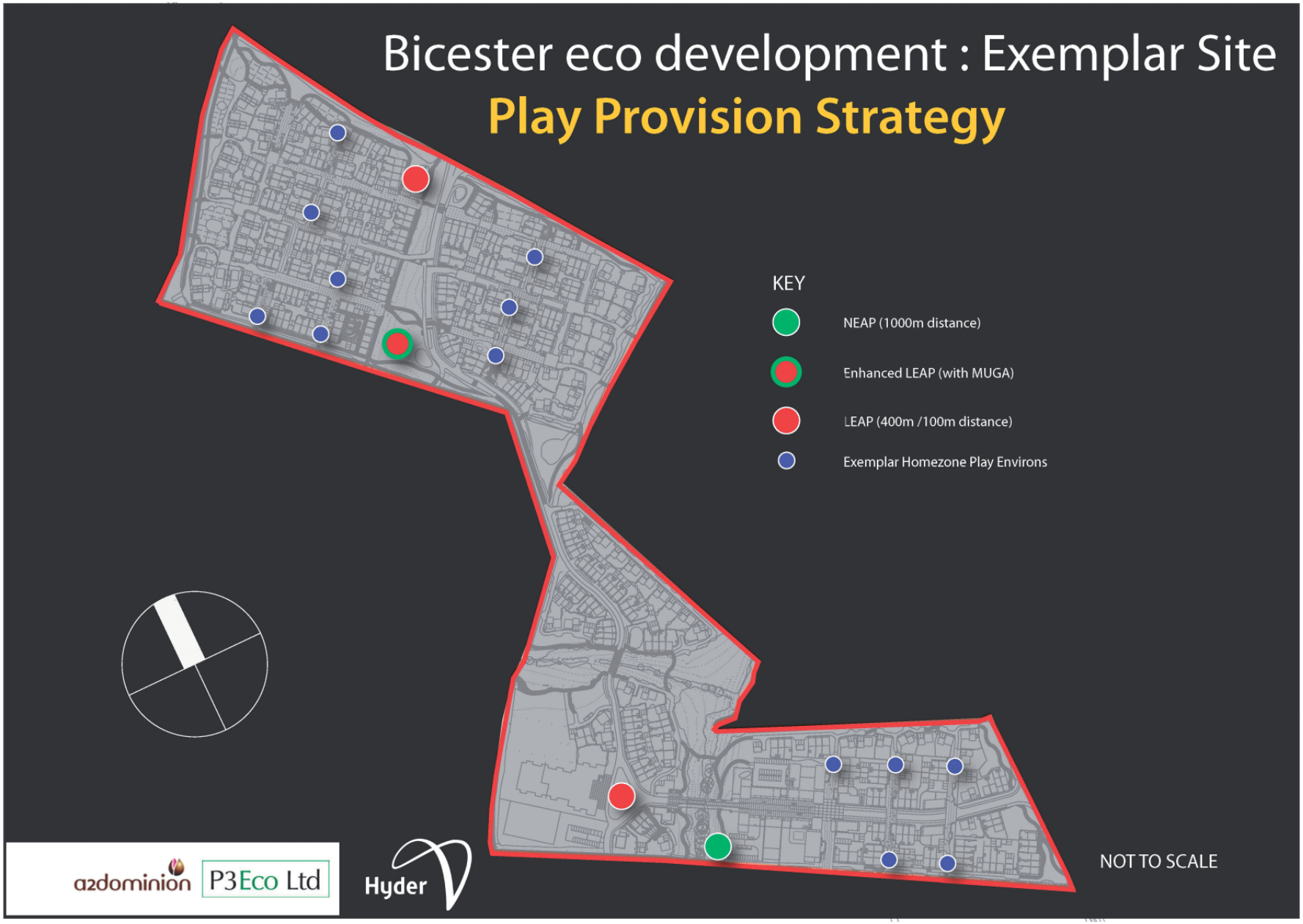
6.1 LANDSCAPING

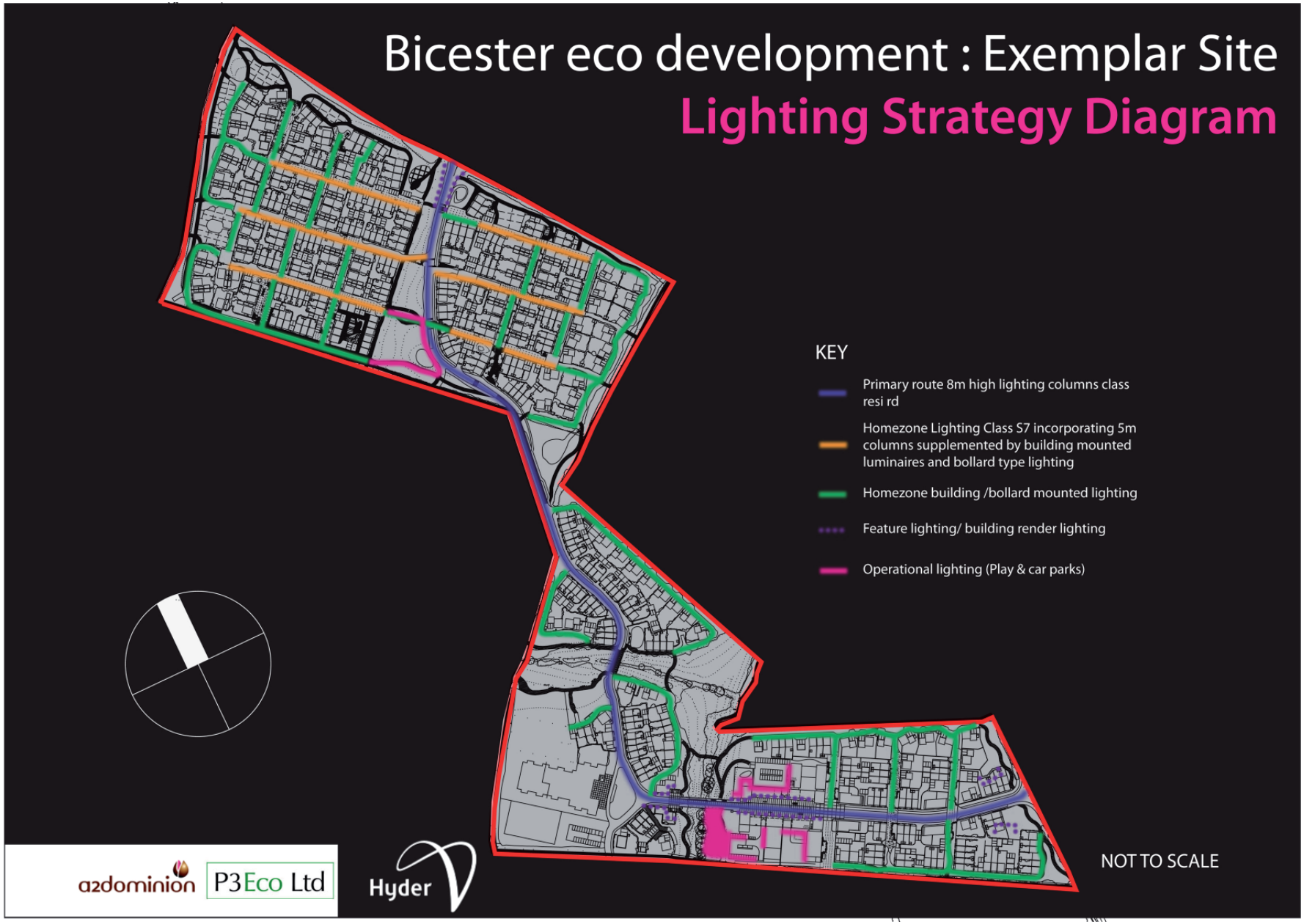
6.1 LANDSCAPING



PUBLIC/PRIVATE	Areas for Exemplar	m2	ha	% GI % EXEMPLAR SITE	% GI % OF TOTAL GI
	Exemplar boundary	211246	21.1246	**100%**	
PUBLIC	**Hedgerows / Buffers**	**26311**	2.6311	**12.46%**	27.72%
	Rivers & Riparian Corridors	**17093**	1.7093	**8.09%**	18.01%
	Green link	**8561**	0.8561	**4.05%**	9.02%
	Natural Play / Recreation (to incl. all LEAPs & NEAP)	**5326**	0.5326	**2.52%**	5.61%
	SuDS / Swales	**2249**	0.2249	**1.06%**	2.37%
	Exemplar Homezones (incl. play environs)	**20085**	2.0085	**9.51%**	21.16%
	Classic Homezones (Woonerf)* * (not included toward total GI contribution)	**6219**	0.6219	**2.94%**	
PRIVATE	**School Green Space**	**10197**	1.0197	**4.83%**	10.74%
	Community Growing / Allotments	**5079**	0.5079	**2.40%**	5.35%
	Domestic* av 50m2 at 394 units * (not included toward total GI contribution)	19700	1.97	**9.33%**	
	SUB-TOTALS	**120820**	**12.082**	**57.19%**	**100.00%**
	(Classic Homezones)	6219	0.6219	**-2.94%**	
	(Domestic)	19700	1.97	**-9.33%**	
PUBLIC & PRIVATE (Excluding Classic Homezones & Domestic Private Gardens)				**44.92%**	
PUBLIC				**37.69%**	
PRIVATE				**7.23%**	

6.1 LANDSCAPING




Bicester eco development : Exemplar Site
Lighting Strategy Diagram
KEY
Primary route 8m high lighting columns class resi rd
Homezone Lighting Class S7 incorporating 5m columns supplemented by building mounted luminaires and bollard type lighting
Homezone building /bollard mounted lighting
Feature lighting/ building render lighting
Operational lighting (Play & car parks)
NOT TO SCALE
a2dominion
P3Eco Ltd
Hyder

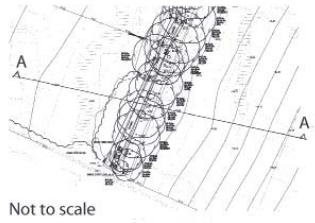
6.1 LANDSCAPING

Bicester eco development : Exemplar

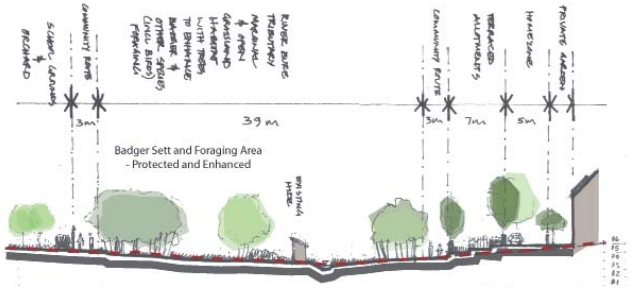
Enhanced LEAP (north)

Drawing no: 8012-UA001881-UP23D-01

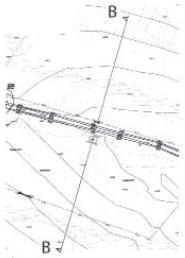
Section A-A
River Bure Riparian Corridor - View North
Scale 1:250@A2



Not to scale



Section B-B
River Bure Tributary - View West
Scale 1:250@A2



Not to scale

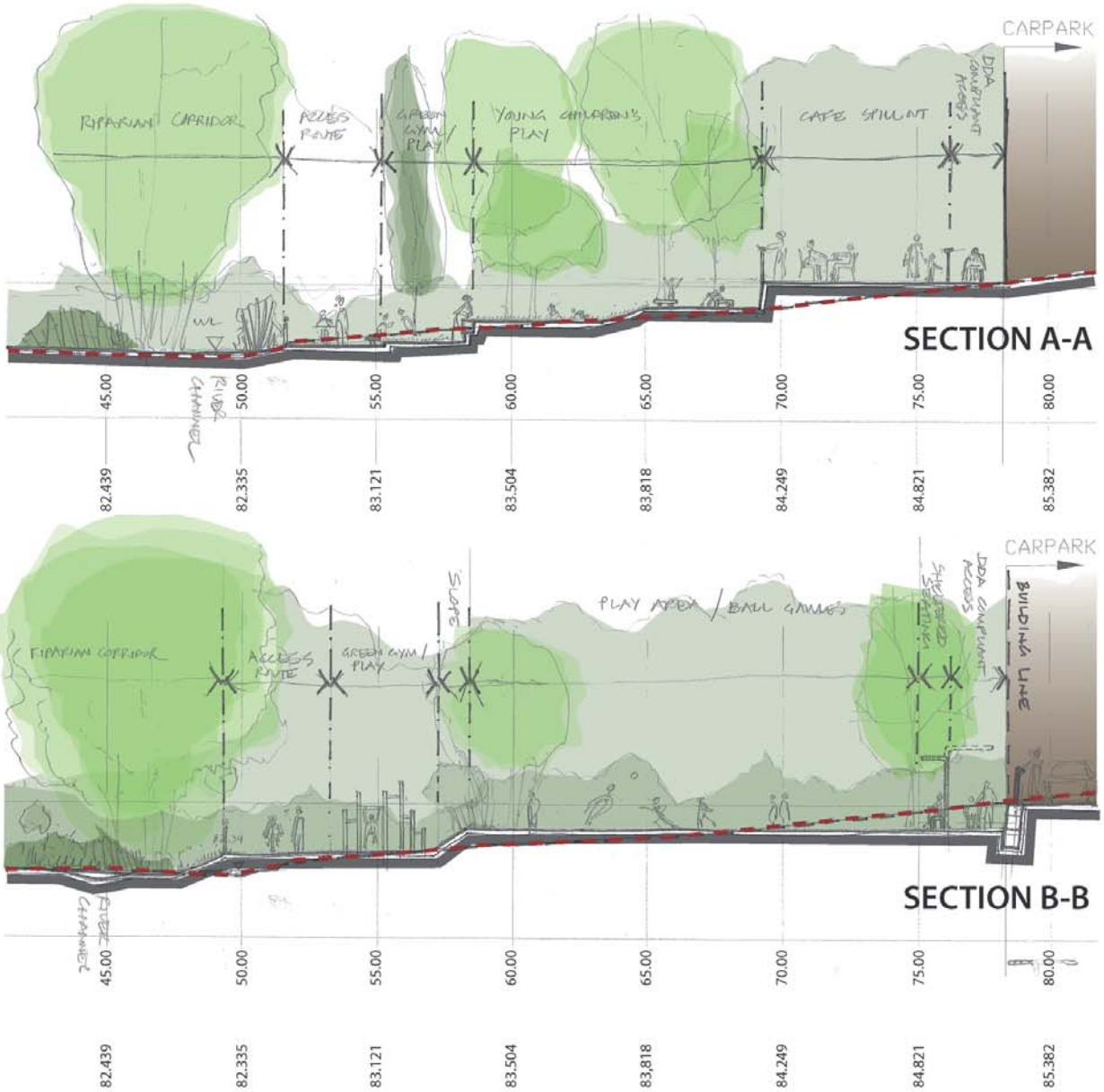
Bicester eco development : Exemplar

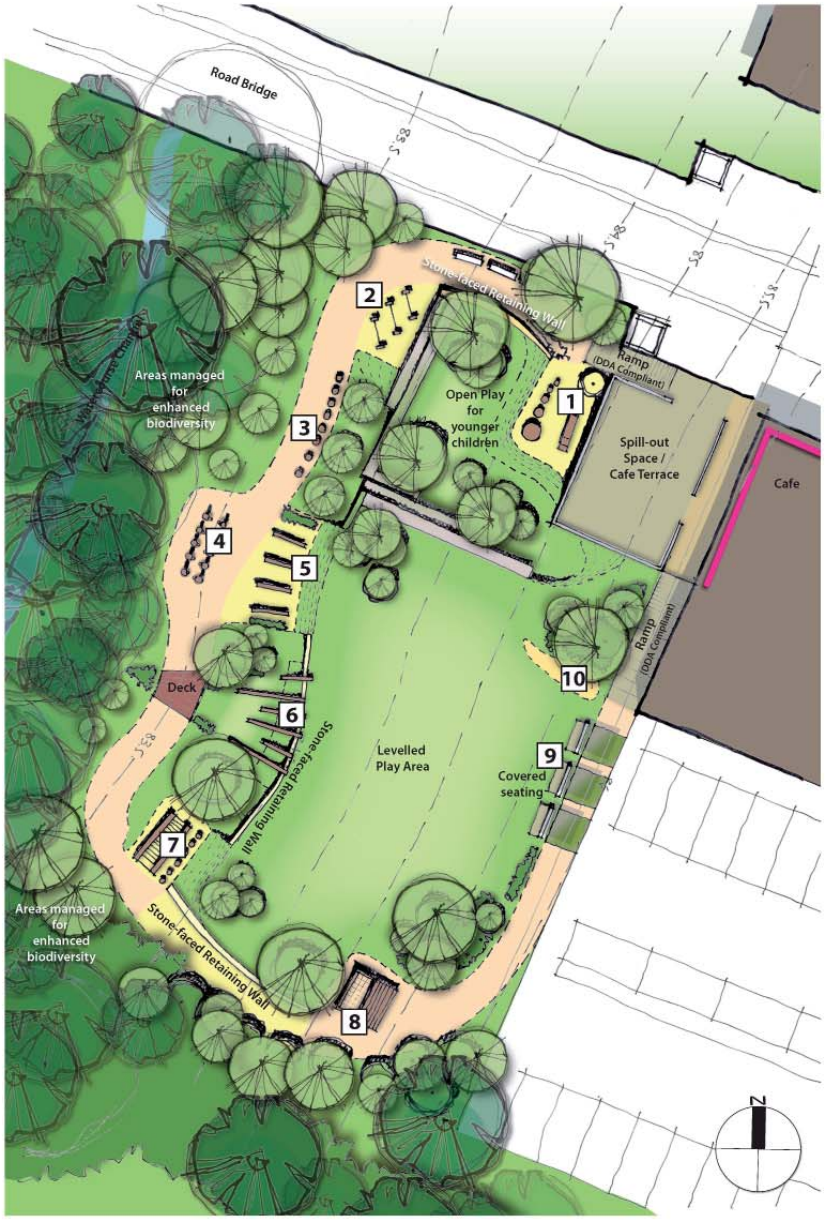
River Corridor Sections

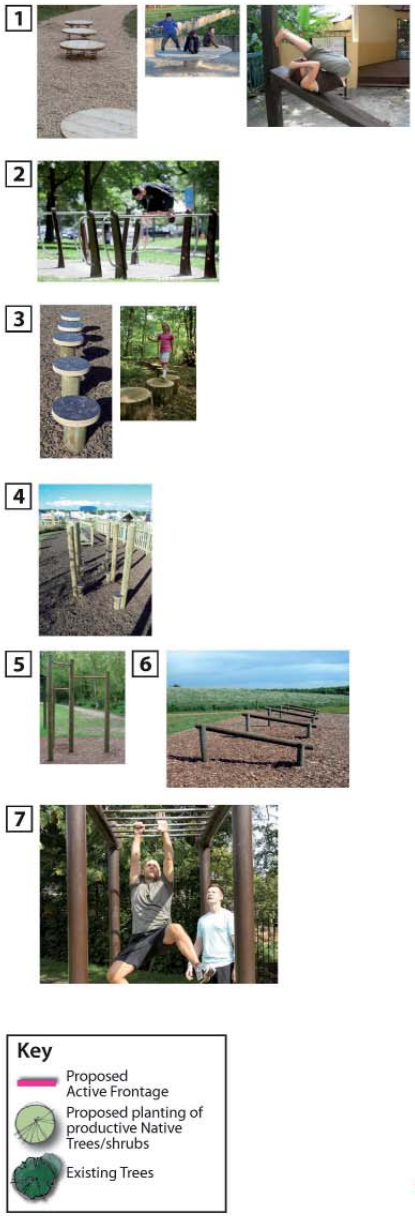
Drawing number 8014-UA001881-UP23D-01

a2dominion P3Eco Ltd Hyder

6.1 LANDSCAPING







Refer also to Drawing number
8011-UA001881-UP23D-01 River Corridor Sections

Bicester eco development : Exemplar

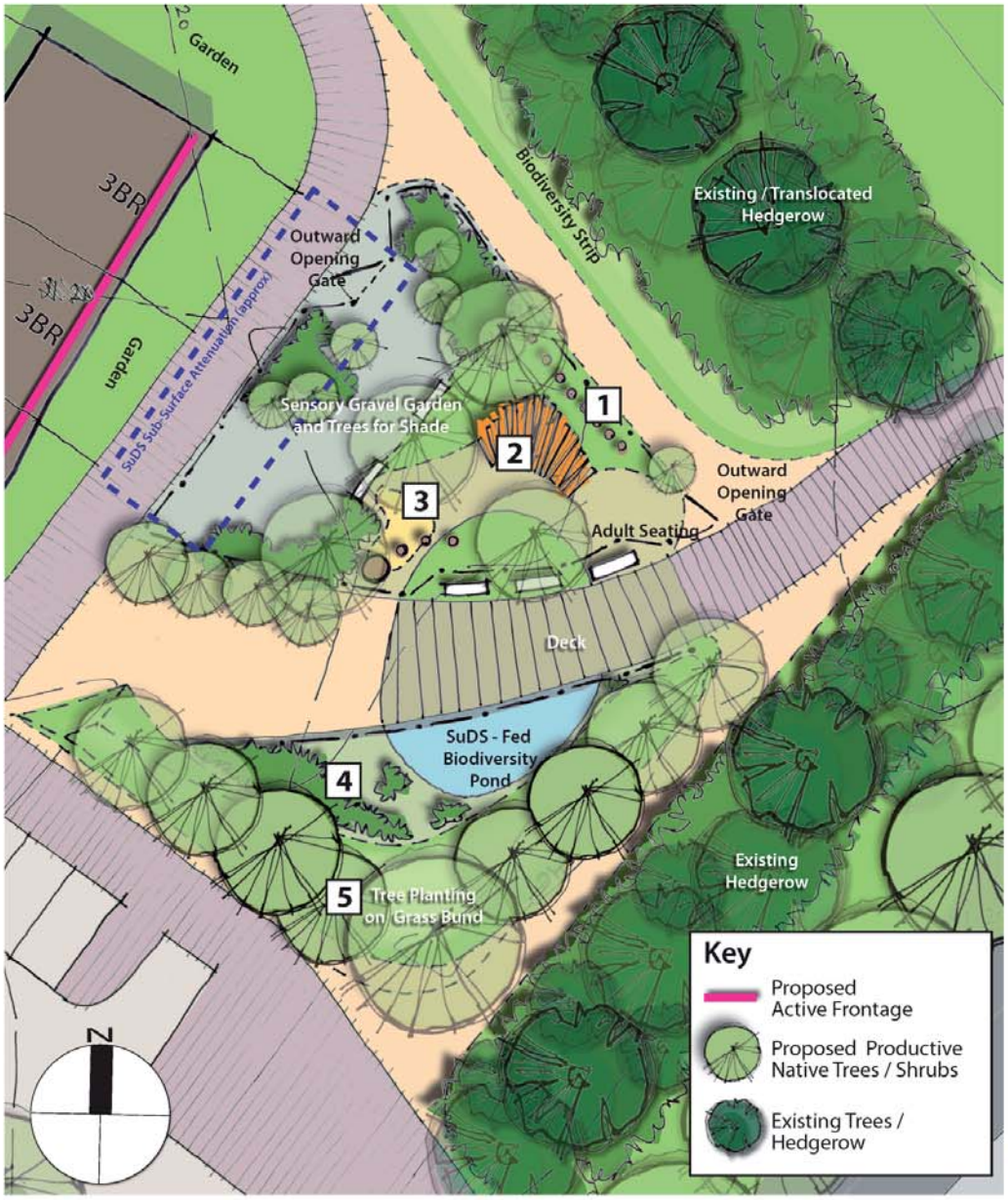
River Corridor NEAP

Drawing no: 8010–UA001881-UP23D-01

Scale 1:125 @ A1

a2dominion P3Eco Ltd Hyder

6.1 LANDSCAPING



Bicester eco development : Exemplar

LEAP (north)

Drawing no: 8013-UA001881-UP23D-01

Scale 1:125 @ A2

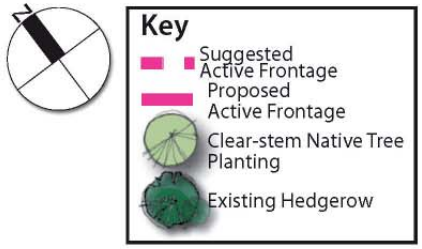
a2dominion P3Eco Ltd Hyder

Bicester eco development : Exemplar

Classic Homezone (Woonerf)

Drawing no: 8008-UA001881-UP23D-01

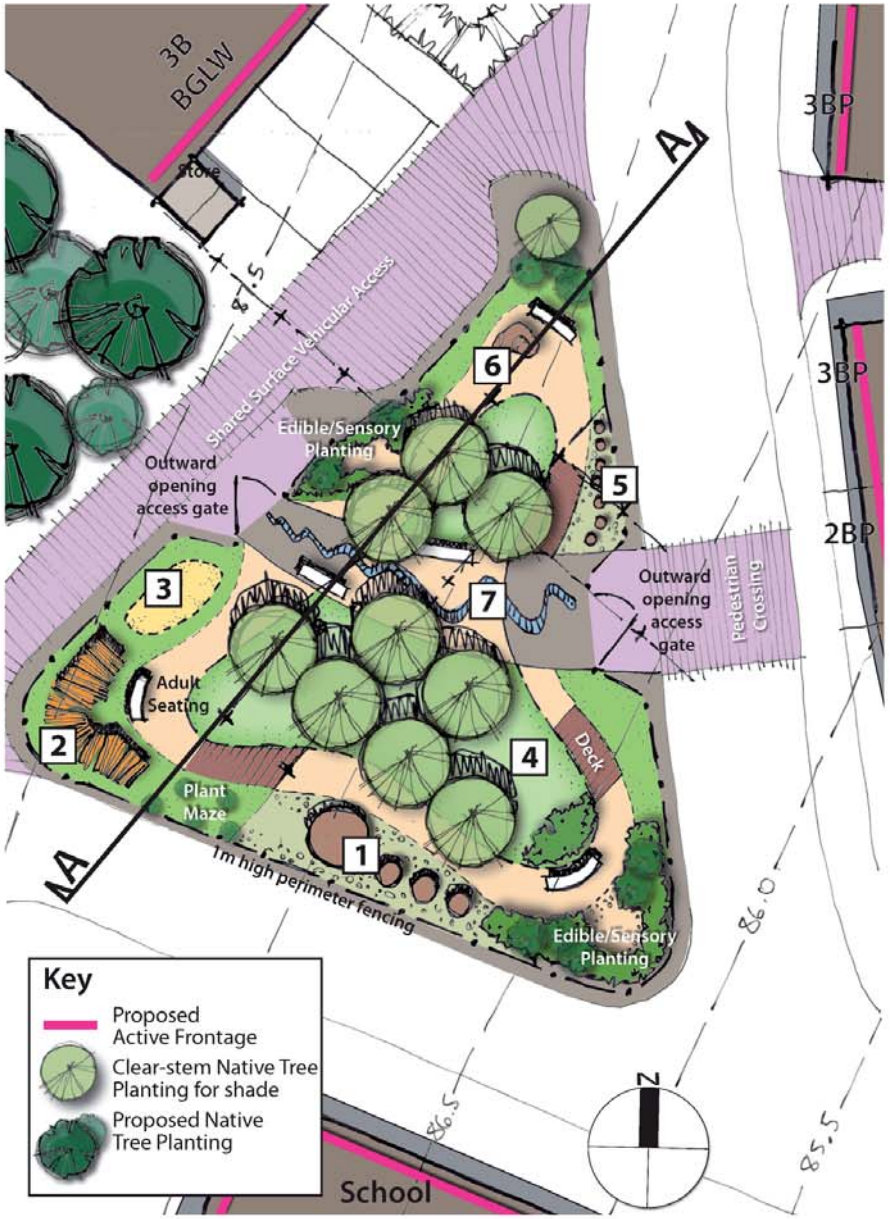
Scale 1:250 @ A3

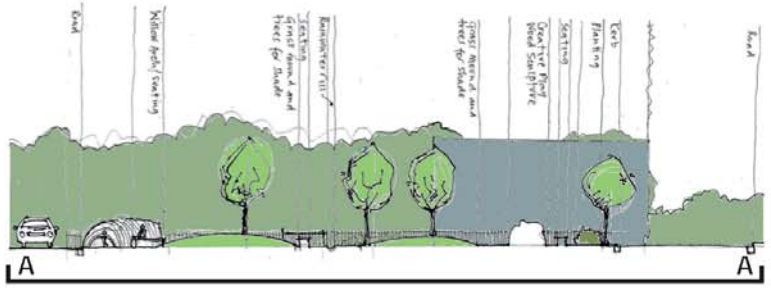


Exemplar Homezone Area

a2dominion P3Eco Ltd Hyder

6.1 LANDSCAPING





NOTE : Revision of Layout for Village Green shown in insert below - principles set out in layout will be applied to revised footprint

Bicester eco development : Exemplar

Village Green LEAP

Drawing no: 8009-UA001881-UP23D-01

Scale 1:125 @ A2

a2dominion P3Eco Ltd Hyder

%	Wild Flowers
8	Betony Stachys officinalis
3	Common Bird's-foot-trefoil Lotus corniculatus
4	Cowslip Primula veris
2	Devil's-bit Scabious Succisa pratensis
1	Fleabane Pulicaria dysenterica
5	Lady's Bedstraw Galium verum
12	Common Knapweed Centaurea nigra
2	Greater Bird's-foot-trefoil Lotus pedunculatus
8	Meadow Buttercup Ranunculus acris100
7	Meadowsweet Filipendula ulmaria
2	Meadow Vetchling Lathyrus pratensis
3	Oxeye Daisy Leucanthemum vulgaris
6	Ragged Robin Lychnis flos-cuculi
9	Ribwort Plantain Plantago lanceolata
9	Self-heal Prunella vulgaris
6	Common Sorrel Rumex acetosa
2	Tufted Vetch Vicia cracca
4	Yarrow Achillea millefolium
7	Yellow Rattle Rhinanthus minor

%	Grasses
29	Red Fescue Festuca rubra
9	Common Bent Agrostis capillaris
35	Crested Dog's-tail Cynosurus cristatus
5	Meadow Fescue Festuca pratense
5	Meadow Foxtail Alopecurus pratense
15	Smooth Meadow-grass Poa pratensis
1	Sweet Vernal Grass Anthoxanthum odoratum
1	Meadow Barley Hordeum secalinum

Wild Flowers	Grasses and sedges
Common Knapweed Centaurea nigra	Pendulous Sedge Carex pendula
Wild Angelica Angelica sylvestris	Hard Rush Juncus inflexus
Meadowsweet Filipendula ulmaria	Soft-rush Juncus effusus
Creeping Buttercup Ranunculus repens	Yorkshire-fog Holcus lanatus
Greater Burnet Sanguisorba major	Tufted Hair-grass Deschampsia cespitosa
Meadow Crane's-bill Geranium pratense	
Red Campion Silene dioica	
Field Scabious Knautia arvensis	
Oxeye Daisy Leucanthemum vulgare	

1. SUDS feature on eastern boundary

Ditch next to landscape tree and shrub planting, likely to be dry for much of the time. Plant with a wet grassland mix that likes calcareous soils– this should tolerate drying out but will not suffer if under water during the winter months. Ready made mix from Charles Flower, Flower Farms below:

2. SUDS feature on eastern side of access road in northern part of site

Gravel filled trench with strip of soil adjacent, soil 450-600mm deep. Plant soil with tall herbs and grasses associated with damp soil that will tolerate drying out, species include:

6.1 LANDSCAPING

3. SUDS feature on western side of access road in northern part of site

Wide feature with ephemeral pools, assuming that there is soil suggest and mixture of tall and short wetland plants:

Wild Flowers	Grasses and sedges
Yellow Iris Iris pseudacorus	Pendulous Sedge Carex pendula
Wild Angelica Angelica sylvestris	Reed Canary-grass Phalaris arundinacea
Meadowsweet Filipendula ulmaria	Soft-rush Juncus effusus
Purple Loose-strife Lythrum salicaria	Yorkshire-fog Holcus lanatus
Water Mint Mentha aquatica	Tufted Hair-grass Deschampsia cespitosa
Yellow Loosestrife Lysimachia vulgaris	
Ragged Robin Lychnis flos-cuculi	
Marsh Marigold Caltha palustris	

4. SUDS feature-pond on western side of access road in northern part of site

Marginal and aquatic plants

Marginals	Marginal Grasses and sedges
Yellow Iris Iris pseudacorus	Lesser Pond-sedge Carex acutiformis
Wild Angelica Angelica sylvestris	Reed Canary-grass Phalaris arundinacea
Meadowsweet Filipendula ulmaria	Floating Sweet-grass Glyceria fluitans
Purple Loose-strife Lythrum salicaria	
Water Mint Mentha aquatica	
Flowering Rush Butomus umbellatus	
Ragged Robin Lychnis flos-cuculi	
Water Forget-me-not Myosotis scorpiodes	
Aquatics	
Yellow Water-lily Nuphar lutea	
Frogbit Hydrocharis morsus-ranae	
Spiked Water-milfoil Myriophyllum spicatum	

Around the edge plant a mix of wild flowers as a buffer between the pond and the amenity grassland:

%	Wild Flowers
5	Common Bird's-foot-trefoil Lotus corniculatus
7	Common Vetch Vicia sativa
7	Field Scabious Knautia arvensis
12	Lady's Bedstraw Galium verum
12	Common Knapweed Centaurea nigra
4	Meadow Buttercup Ranunculus acris
10	Musk Mallow Malva moschata
10	Oxeye Daisy Leucanthemum vulgaris
15	Self-heal Prunella vulgaris
5	White Campion Silene latifolia
8	Wild Carrot Daucus carota
5	Yarrow Achillea millefolium

%	Grasses
40	Red Fescue Festuca rubra
20	Crested Dog's-tail Cynosurus cristatus
30	Sheep's Fescue Festuca ovina
10	Smooth Meadow-grass Poa pratensis

5. SUDS feature-small ponds in southern part of site
Nothing too big

Marginals	**Marginal Grasses and sedges**
Wild Angelica Angelica sylvestris	Reed Canary-grass Phalaris arundinacea
Meadowsweet Filipendula ulmaria Lesser Spearwort Ranunculus flammula	Floating Sweet-grass Glyceria fluitans
Purple Loose-strife Lythrum salicaria	
Water Mint Mentha aquatica	
Gypsywort Lycopus europaeus	
Ragged Robin Lychnis flos-cuculi	
Water Forget-me-not Myosotis scorpiodes	
Marsh Marigolds Caltha palustris	
Aquatics	
Frogbit Hydrocharis morsus-ranae	

Wild Flowers	**Grasses and sedges**
Yellow Iris Iris pseudacorus	Red Fescue Festuca rubra
Wild Angelica Angelica sylvestris	Reed Canary-grass Phalaris arundinacea
Meadowsweet Filipendula ulmaria	Soft-rush Juncus effusus
Purple Loose-strife Lythrum salicaria	Yorkshire-fog Holcus lanatus
Water Mint Mentha aquatica	
Yellow Loosestrife Lysimachia vulgaris	
Ragged Robin Lychnis flos-cuculi	
Marsh Marigold Caltha palustris	
Water Forget-me-not Myosotis scorpiodes	
Greater Bird's-foot-trefoil Lotus pedunculatus	
Common Valerian Valeriana officinalis	
Gypsywort Lycopus europaeus	

6. SUDS feature-ditch along main access road in southern part of site

Having thought about it my suggestions regarding the design are either:
a) Plant in soil adjacent to the feature possibly with the ground at a gentle gradient to the ditch so that at low flows the water flows through the soil first.
b) Plant in soil on a shelf within the ditch with a water permeable vertical partition between the soil and the ditch. The partition will allow the flow of water but prevent the soil from washing away into the ditch.

To create the desired screen I suggest:
Common Reed Phragmites australis
Reed Canary-grass Phalaris arundinacea
Purple Loosestrife Lythrum salicaria (for some colour)

7. Bog garden/temporary pond in the school grounds

8. Calcareous grassland within exemplar site (stream corridor)
This mix will need to be sown on sub-soil since the topsoil will be too nutrient-rich.

9. Orchard trees suitable for badgers
Badgers like all windfallen fruit but given that the birds get the cherries suggest you plant apples plums and pears.

10. Native wildflower grassland to use in the school grounds
If its possible tocreate areas of long grass habitat in the school nature trail use the wildflower meadow mix that I suggested should provide a buffer for the pond (Area 4).

11. Native trees and shrubs for landscape planting
Based on what Arup have recorded in the hedgerows on the wider eco-town site, Native planting would comprise:

All of the above bare fruit, seeds or nuts of value to wildlife

They also recorded Elm in the hedgerows but unless you can get varieties that are resistant to Dutch Elm disease I wouldn't plant them.

Other trees likely to be on site- but not recorded in hedgerows:
Likely to be on the streams Crack-willow Salix fragilis, White Willow Salix alba and Alder Alnus glutinosa* if we do plant any Alders they would need to be guaranteed free of Phytophera.

Other shrubs likely to be on site Grey Willow Salix cinerea and Goat Willow Salix caprea again in damp areas.

%	Wild Flowers
5	Common Bird's-foot-trefoil Lotus corniculatus
3	Burnet Saxifrage Pimpinella saxifraga
4	Perforate St. John's Wort Hypericum perforatum
7	Cowslip Primula veris
5	Greater Knapweed Centaurea scabiosa
8	Hoary Plantain Plantago media
7	Kidney Vetch Anthyllis vulneraria
5	Common Knapweed Centaurea nigra
4	Meadow Buttercup Ranunculus acris
10	Lady's Bedstraw Galium verum
1	Oxeye Daisy Leucanthemum vulgaris
10	Salad Burnet Sanguisorba minor
9	Self-heal Prunella vulgaris
3	Small Scabious Scabiosa columbaria
4	Wild Carrot Daucus carota
5	Wild Marjoram Origanum vulgare
2	Yarrow Achillea millefolium
2	Glaucous Sedge Carex flacca
6	Yellow Rattle Rhinanthus minor

%	Grasses
35	Red Fescue Festuca rubra
5	Common Bent Agrostis capillaris
28	Crested Dog's-tail Cynosurus cristatus
5	Sheep's Fescue Festuca ovina
5	Smooth Meadow-grass Poa pratensis
2	Yellow Oat-grass Trisetum flavescens
100	

Trees	Shrubs
Pedunculate Oak Quercus robur	Crateagus monogyna
Ash Fraxinus excelsior	Blackthorn Prunus spinosa
Wild Cherry Prunus avium	Dogwood Cornus sanguinea
	Elder Sambucus nigra
Small trees	Guelder-rose Viburnum opulus
Field Maple Acer campestre	Holly Ilex aquifolium
Crab-apple Malus sylvestris	Hazel Corylus avellana
	Wild Privet Ligustrum vulgare
	Wayfaring-tree Viburnum lantana
	Dog-rose Rosa canina agg
	Field-rose Rosa arvense
	Alder Buckthorn Frangula alnus

11.

7 ENERGY WASTE AND WATER

7.1 Energy Waste and Water

Energy

The energy hierarchy has been adopted as a starting premise to ensure the site can achieve its Eco-town zero carbon target. This requires the development to meet all energy used by and within buildings across the site through energy efficiency, clean and green energy.

This means that achieving high energy efficiency levels has been a fundamental design principle, and one that P3Eco and A2Dominion Group have embraced through committing to develop all homes to Code for Sustainable Homes (CSH) level 5 homes, rather than the required level 4, across the Exemplar site. These homes will be built from highly thermally efficient materials and exhibit extremely high levels of insulation, to ensure they require less space heating than traditional homes. In addition, each home will be fitted with low energy lighting and appliances throughout.

To complete the strategy, a robust and economically viable zero carbon energy solution will also be employed across the eco-development that will incorporate:

- District heat network that will provide space heating and hot water to all homes, businesses and community facilities. This will be powered by a biomass boiler, sized efficiently to meet baseload heat demand. The remaining baseload and peak heat demand will be met by a gas fired combined heat and power system to maintain efficiencies. This will all be located within an energy centre located on the site.

- Building integrated photovoltaics will be placed on all southward facing roofs to generate green renewable electricity.

- Ground source heat pumps will be located in the school and commercial centre to provide additional heating and cooling options.

Waste

Achieving zero construction waste to landfill is a key requirement and has been actively promoted through the design process; and will continue to be so through both materials selection and construction. As part of this, using locally sourced material with high recycled content; along with careful management, ordering and storage of material stock will be important to prevent wastage. On-site reuse and recycling of materials throughout the construction period will also minimise waste.

The Contractors selected to deliver this eco-development will belong to the Considerate Construction scheme, and in addition, the site will be submitted to the CEEQUAL (Civil Engineering Environmental Quality) assessment and award scheme to monitor the developments sustainability through improved environmental quality and social performance.

Minimising waste during the lifetime of the eco-development will follow the waste hierarchy of reduction, reuse and recycling of materials and products. All properties will be supplied with separate recycling bins for organics and recyclables, along with a smaller bin for residual wastes. An ambitious recycling target of 70% will be set for the development; rising to 80% in the future. As well as kerbside recycling collection, bring banks will be located within the centre of the development for glass and textiles. In addition, a community swap shop will be established that will enable other goods to be reused and recycled.

The community governance organisation will promote awareness of waste minimisation, reuse and recycling initiatives across the site; including providing information packs, active promotion, campaigns and education programmes.

Water

A sustainable approach to the supply, efficient use, drainage and treatment of water across the Exemplar site has been adopted. Potable water supply infrastructure is under considerable strain as the area is considered to be water-stressed. To meet this challenge, significant water efficiency measures will be introduced, including rainwater harvesting and reuse (for toilet flushing), water efficient fixtures, fittings and appliances. These measures will enable the homes to achieve far less consumption of potable water than the regional average. A target of no more than 80 l/p/d of potable water will be achieved.

The design of the site has respected the River Bure and its tributary, which flow through the site and their limited flood risk potential. The widespread use of Sustainable Drainage Systems (SuDS), incorporating rainwater harvesting, permeable drainage and swales, will provide storm water management and help recharge the underlying groundwater resource, whilst ensuring that flood risk is reduced. The rate of discharge to the River Bure will be greatly reduced during large rainfall events when compared to the natural state of the site, offsetting historical development within Bicester, and reducing the potential flood risk for areas downstream.

The use of SuDS will also enhance the creation of new wildlife spaces including wetlands, ponds and marginal habitats; as well as improve water quality standards through natural attenuation and biological treatment of storm waters.

Foul water will, through agreement, be discharged to Thames Water Utilities sewerage network and Bicester wastewater treatment works.

8 COMMERCIAL AND EMPLOYMENT

8.1 COMMERCIAL AND EMPLOYMENT

The exemplar will create over 460 new jobs over a period of 4 four to five years, with the potential for another 200 over a slightly longer timescale. It will also begin a transformation the economy and image of Bicester that will only be fully realised through the full eco development.

The exemplar will begin to position Bicester as a hub for 'eco activity', leading to the development over time of a cluster of sustainable construction and other eco- businesses, and related training provision. It will also help Bicester build on existing strengths such as advanced manufacturing and motorsports and to develop a distinctive role within the Oxfordshire high tech cluster.

The exemplar will put in place some of the key building blocks in this process, including; a partnership between P3Eco and Oxford and Cherwell Valley College (OCVC) to develop courses for the eco-economy; an innovative partnership with the Co-Operative, and an Eco-Bicester Research and Innovation Centre (EBRIC), a partnership between P3Eco, Oxford Brooks University and Oxford Innovation.

The construction of the exemplar itself will provide construction jobs. Working on a basis of 0.7 person years per dwelling and an indicative rate of 100 dwellings a year, this equates to 70 FTE jobs. On site facilities are expected to provide 249 additional jobs. These will be primarily located in the eco-business centre, other office provision, retail units, a primary school, nursery and community facilities. Indirect job creation will result from spend by the exemplar's residents, mainly in service jobs. These are expected to equate to 40 FTE jobs based on a multiplier of 0.4.

The exemplar homes will include flexible space to encourage home working, alongside next generation broadband and social spaces within the development. These aspects will be marketed actively to encourage home-working amongst residents. Given this, and national trends for increased home working, an assumption of one FTE home worker for every three dwellings is reasonable. Allowing for those delivering services locally (and therefore already counted), this equates to 105 FTE jobs on site once full occupancy is reached.

As one of a handful of approved eco-towns, Eco Bicester constitutes an attractive location for inward investment, particularly in high-tech manufacturing, engineering and environmental industries. It is too early to quantify these jobs, but given the appeal of Bicester's offer and the mechanisms already under discussion to attract firms into the area, they could significantly boost local employment opportunities.

The exemplar development will also contribute to the wider economic context in three ways. First, it will provide an attractive and supportive environment for people to live and work locally, benefitting from Bicester's excellent connectivity and the strong economic opportunities in the wider Oxfordshire area. Second, the exemplar will kick start the development of a new eco economy in the town, capable of serving a wider area. Third, the exemplar will begin a transformation of the image of Bicester, which in turn will change the town's economic relationship with the wider area. The exemplar provides the opportunity to support the strong and distinctive growth of 'high tech Oxfordshire', northwards from Oxford, rebalancing the southwards biased influenced by the location of research institutes, and major business and science parks.

9 TRANSPORT AND ACCESS

9.1 TRANSPORT AND ACCESS

The design of the site and the provision of walking, cycling and public transport links is such that a high level of non-car use is anticipated for the development and many trips to the school, employment and local shops and services will be contained within the development as the village centre is in a reasonable walking distance of both the northern fields and the southern part of the site.

Two access points are proposed to the development from Banbury Road, the southern access south of Home Farm and the northern access to the south of the Banbury Road lay-by. Both junctions are proposed as priority junctions with protected right turning facilities, to minimise the road space required but provide a safe point of access. In the longer term, the southern access may be upgraded to a traffic signal controlled junction to access the further development to the south and west.

The whole of the site once accessed from the main road network will be designed to a speed of 20mph or lower, with appropriate alignment and traffic calming features to maintain low vehicle speeds. The central 'spine' route will provide access to the development from each of the junctions on Banbury Road. In the short term this will be for all traffic, in the longer term as more development takes place then it will become a bus, cycling and walking only link (as well as emergency vehicles). The middle section to the south of the northern fields, will be a lane in character with passing places to discourage through trips and short journeys from houses in the north to the village centre. The spine route has two bridges which will be narrow with one way priorities and serve as calming features on the route length.

Leading off the spine route will be streets designed to 15mph vehicle speeds. There will be access streets allowing all vehicle movements and with some on street parking within the street design. There will be home zones with a small number of properties fronting a public space which will be restricted in access by physical design to accommodate occasional drop off/ pick up parking, walkers and cyclists. These areas will be serviced from the adjacent access streets, thus giving a high priority to pedestrians and children's play.

The northern fields development is based on a permeable network of low traffic routes which will have priority for pedestrians and cyclists by virtue of speed, surfacing and layout. There are also a number of pedestrian/ cyclist only links proposed to provide direct connections leading to the focal open space and via a direct alignment to the school and village facilities to the south. Pedestrian routes will be surfaced and lit with directional and distance signing.

A 3m wide walking and cycling route is proposed on both sides of Banbury Road southwards from the southern access junction. Part of this will be segregated from the carriageway by the hedgerow, with the remainder alongside the road. Toucan crossings are proposed to link to the eastern side of Banbury Road and connect to Caversfield and as a crossing of Lord's Lane connecting to the main cycle route on the northern side of Bure Park and on to town centre linkages. In the longer term there will be linkages through the fields to the south of the proposed development, connecting to the public footpaths through Bure Park and adjacent to the rail line.

The central spine road will form a bus route through the development, giving access to the majority of properties within 400 metres walking distance. Bus stops are proposed in the village centre and in the northern residential area.

9.2 PARKING PROVISION

Parking provision

The approach to parking in each aspect of the development has required a careful balance between meeting the needs of residents/ businesses and not unduly encouraging car use. Whilst Eco-town good practice recommends a much reduced provision of parking over standard developments, it is recognised that the NW Bicester site is in a predominately rural County where car ownership levels are (often by necessity) high.

The provision of parking provides a balance whereby the Exemplar Site is vibrant and commercially successful but excessive parking provision does not encourage the use of the car for short or regular trips.

Residential Car Parking Provision

The parking strategy for residents recognises that the majority of households will own at least one car. It therefore seeks to ensure that the residential development does not significantly under-provide for parking and then suffer from problems of inappropriate/ overspill parking but does not encourage car use by providing parking immediately in front of every household's front door.
The Cherwell DC standards set a maximum level of providing 1 space per dwelling for 1 bed properties, 2 spaces for 2, 3 or 4 bed properties plus an optional garage. With the anticipated mix of properties, the maximum would give rise to an average of 2 spaces per property plus garages. For the Exemplar Site, it is proposed that there is an average of 1.38 spaces per property plus garages. The parking for residential accommodation is as follows:

Private Accommodation

2 & 3 bed housing: predominately 1 parking space and 1 single garage, some 2 parking spaces (in parking courts);
4 bed detached housing: 2 parking spaces and 1 single garage (on plot); and
5 bed detached housing: 2 parking spaces and 1 double garage (on plot).

Social Accommodation

1 parking space for 1 and 2 bed flats;
2 & 3 bed housing: predominately 1 parking space and 1 single garage, some 2 parking spaces (in parking courts);
2 parking spaces to disabled bungalows. Bungalows to have on plot parking whilst parking facilities to social houses provided in parking courts;
4 bed detached housing: 2 parking spaces and 1 single garage (on plot); and
5 bed detached housing: 2 parking spaces and 1 double garage (on plot).

Visitor spaces are to be provided in parking bays within the street design, primarily in Home Zone B (access streets) with a maximum of 87 spaces provided across the development, representing one space per 4.5 residential units

Non Residential Car Parking Provision

Parking provision for other uses recognises the level of trips that will be on foot, cycle or by bus and the aim to discourage trips by car. The table to the right shows the provision of parking for each of the non-residential uses on site.

Land Use	Floorspace / pupils	Parking Provision	Max Provision in CDC standards
Primary School	135 pupils	9	9
Eco Business Centre	1,800sqm	20	60
Community Centre	350sqm	14	17
Children's Nursery	350sqm	Shared with above	Unspecified
Co-Operative Food store	550sqm	22	39
Non Food Shops	220sqm	Shared with above	11
Offices	1,100sqm	Shared with above	37
Eco Pub	190sqm	3	18
Total	**Above**	**68**	**191**

10 SECURED BY DESIGN PRINCIPLES

10.1 Design Response

Secured by Design Principles were closely considered from an early stage in development design.

A series of informal pre-application consultations were undertaken to discuss the designs and reference was made to Thames Valley Police's 'The Compendium' publication. In turn we used guidance from CABE's 'By Design-Better Places to Live' and 'By Design-Urban Design in the Planning System', 'The Urban Design Compendium', the Home Office's 'Safer Places-The Planning System and Crime Prevention', The Department of Communities and Local Governance's 'Manual for Streets', English Partnerships' 'Car Parking- What works where?' and Secured By Design 'New Homes 2010'.

Throughout the layout care has been taken to clearly define private and non-private areas. The design response to the southern and northern fields, in particular, has been to create a legible network of streets and spaces that facilitate movement and self orientation, making the development welcoming to visitors and residents alike. Trees and shrubs throughout public areas will be specified to allow unobstructed sight lines to facilitate this legibility, whilst shrubs are approximately 1m in height to eradicate hiding places.

The Village Centre has been designed to be a vibrant and welcoming space with the impact of vehicles minimised to promote the public realm. The positioning of the car parks has been carefully considered and the provision is divided into two, to relate to different functions provided. Each is gated and it is proposed that when the business centre, nursery and community spaces are not being used, the gates to the northern car park are closed. This means in the evening when the village store is still open the southern car park is in sole operation and therefore can be more easily monitored. The provision of an A3 unit to this side of the street also provides a greater level of activity which helps self policing. In addition CCTV ducting will be provided to the car parks, it is noted that Thames Valley Police's preference is for data to be fed to the County Council system control room.

Lighting has also been considered and this is documented in the Landscape chaper. The amount of lighting has been carefully balanced against the ecological impacts on bat commuting zones and habitat creation.

The housing has been organised to maximise overlooking and to create active frontages to the building plots. As a rule, throughout the development, housing is placed to face hedgerows and this helps for the maintenance of the planting, brings the vegetation into the public realm so that it is monitored and it removes hedgerows being used as insecure boundaries to back gardens.

In a move to encourage interaction and overlooking to the streets, housing is placed close to back of pavement. Defensive zones are created using low level planting to ensure occupant privacy. Subsequently, cars are placed behind the housing but a number of measures have been introduced to ensure the car parking courts are safe and well monitored. The car courts have been considered not as car parks but as places that have parking with them and an amenity to the surrounding properties. Refuse and cycle storage are accessible from these spaces which increase activity to these zones. The entrance to each is gated (full height) whilst the size of the provision and the number of car spaces has been carefully controlled to limit the number of occupants using each. The familiarity of such an arrangement will alert occupants of people outside of their immediate circle. In addition, low level hedges and 45 degree spaced fencing to the courtyards will provide enclosure but allow for glimpse views and awareness of sounds coming from these areas.

Play areas have been designed generally within the guidelines for NEAP's and LEAP's but with adjustments agreed by the local Planning authority, with proprietary installations fitting to aid natural play.

Housing will also meet Secured by Design criteria in terms of the detail specification of the doors, windows and their locks.

11 ACCESS STATEMENT

Accessibility

The design of the development seeks to provide accessibility for all. The design layout inherently offers high permeability in all directions within the Exemplar Site and also to the surrounding landscape and future wider Masterplan site. The aim and objectives for the development in terms of access and travel are set out in the Draft Travel Plan and provide the applicant's policy on access. These objectives have been developed in accordance with good practice for travel plans and support the specific requirements of the Annex to PPS1. The overarching aim for the development is to:

"Reduce the need or desire to travel through integrated design and provide sustainable travel choice options that have less reliance on private cars and seek to relieve congestion."

The specific objectives are:

- To create a high quality place in which people want to live and work
- To reduce the need to travel whilst ensuring access to a full range of facilities and services
- To promote the use of non-car modes – walking, cycling and public transport
- To manage traffic to reduce vehicle speeds and give priority to pedestrians, cyclists and public transport over cars
- To ensure there are no undue congestion impacts on the wider town and road network arising from the development

The aim and objectives for the development are met in the design of the development by the following:

- Creation of a permeable network of streets together with segregated walking and cycling routes between parts of the development;
- Provision of a range of facilities and services which meet many of the day to day needs of residents;
- Provision a bus service through the site to and from the town centre, with stops (with high quality shelters and information) providing access for residents within 400 metres;
- Providing a hierarchy of streets with a central spine road designed for a 20mph speed limit and linking access streets and home zones designed for a 15mph speed limit and designed to discourage car use through alignment, width, hard and soft landscaping and traffic calming features;
- Providing a balanced approach to parking, which recognises that residents are likely to own cars but seeks to encourage sustainable travel to and from the site, particularly by limiting parking for non-residential uses;
- To reduce impacts on the wider road network by travel planning measures and provision of public transport, walking and cycling linkages; and
- Mitigating impacts of traffic through junction improvements on the local road network.

The principles of accessibility for the site have been developed taking into account the planning policies of Cherwell District Council (prepared in conjunction with Oxfordshire County Council) as contained in the Non-Statutory Cherwell Local Plan 2011. Specifically, in relation to Policy TR19, the roads to serve the proposed development have been designed and constructed to give priority to pedestrians, cyclists and bus operators and to ensure a maximum design speed of 20 mph on principal estate roads and 15 mph on all other roads.

In addition, proposals for home zones are included which in accordance with Policy TR19a are located within a predominantly residential area and would result in a significant reduction in vehicle speeds. They are designed as areas where, as stated in the policy commentary "children can play or ...people can stand talking in safety, even if they have to move occasionally to allow vehicles to pass."

The layout of footways and walking routes to facilities has been designed to ensure that they comply with the Disability Discrimination Act and relevant guidelines, in terms of gradient, widths and surfacing. Where there are short sections of paths which are of steeper gradient, then there is an alternative fully accessible route. The public areas of the village centre and around the school will be well lit, surfaced in suitable materials to assist orientation for those with visual impairments and will meet requirements for slip resistance.

Road crossing points and junctions will be identified with tactile paving and dropped kerbs or raised tables. Access to the non-residential buildings will comply with the DDA, including provision of ramped access, where necessary and appropriate standard lifts to upper floors. Within the village centre, a proportion of the parking spaces will be of extra width (3.6m) and set aside for blue badge holders. Bus stops will be kerbed to allow level access onto buses for wheelchairs as well as for prams and pushchairs. Bollards and other street furniture will comply with guidance to assist the visually impaired. Street furniture will be designed to minimise street clutter to retain clear space within the public realm as far as is practicable.

Several community routes have been designed in to the overall route provision, the main route being on road as it is required by Oxfordshire County Council to be well lit at all times. Off road provision is also included, without lighting, to retain unlit corridors for biodiversity benefit.

Home zones are designed to be shared surfaces to reduce the potential dominance of the motor vehicle and create streets for people, by design. Flush surfaces and / or low kerbs and drop kerbs promotes access for all including wheelchair users. Similarly, all play provision is designed for access for all and to accommodate wheeled activity as required by guidance.

The street network has been designed for emergency vehicles in accordance with Oxfordshire County Council Residential Design Guidance. The development has two access points to ensure that the 393 proposed homes are not served off a single access point (Section 6.38). Access for fire tenders is provided to within a distance of less than 45 metres from all parts of the ground floors of all homes (Section 6.41-6.44). Swept path analysis of the street layout has been undertaken and used as the basis for the design of turning areas and routes through the hierarchy of streets for refuse vehicles and emergency vehicles, in accordance with OCC guidelines. Where there are short sections of street which are designed to be generally vehicle free, sufficient area is provided for the occasional use by removal vehicles, emergency vehicles etc. In such home zones, it is proposed that refuse is collected from the ends of the streets. This also applies where there are private drives serving up to five properties.