North Selby Leisure Proposal

Design and Access Statement

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Harworth

Contents

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1.0 Introduction

This Design and Access Statement has been prepared by Estell Warren on behalf of Harworth Estates Investments Ltd to accompany their outline planning application for a leisure development at the former North Selby Mine site, near Escrick, York.

This statement is to be read in conjunction with the Environmental Statement and Planning Statement that accompany the application. Planning policy matters related to design and access are set out fully in the Planning Statement.

This statement explains the access and design approach that underpins the proposed scheme and identifies the principal issues that have influenced and generated the proposed design. The scope and content of the statement is laid out as follows:

- a description of the existing site, including its context, access and physical qualities;
- an explanation of the opportunities and constraints presented by the site and identification of the key design objectives that have informed the design of the proposed scheme;
- an explanation of scheme evolution, including responses made in the design to pre-application discussions and public consultation;
- a description of the design and EIA parameters that have been adopted for the proposed scheme;
- an indicative masterplan and outline description of the proposed scheme including access arrangements, landscape design, biodiversity, drainage, lighting and building design aspects of the proposal.

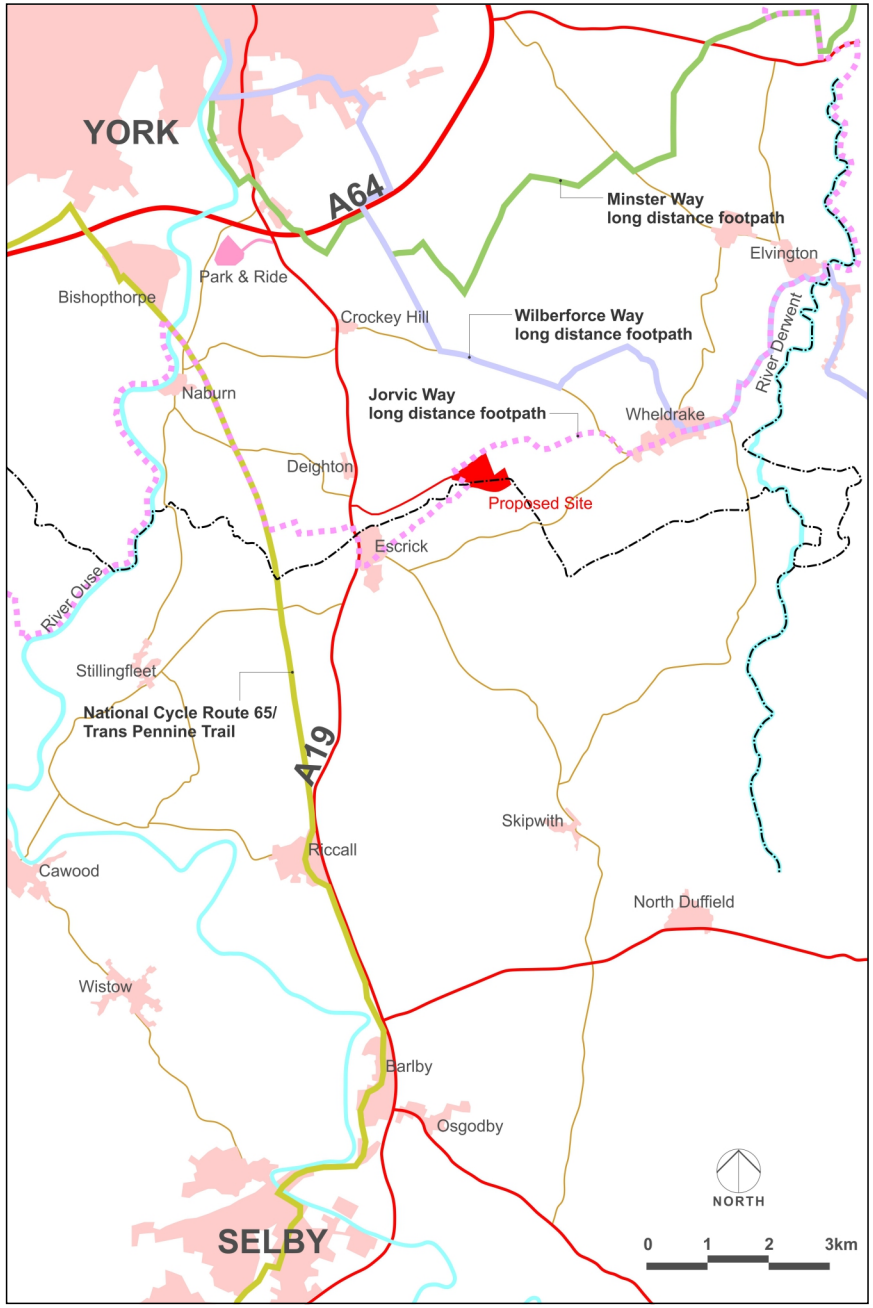


Figure 1: Site Location & Access

2.0 The Existing Site

Location

The site is located broadly midway between the villages of Escrick and Wheldrake, approximately 6.5km south east of York and 12km north of Selby, at approximate Grid Reference 464800 444200. **Figure 1** shows the sub-regional context of the site whilst **Figure 2** shows the local context.

Planning History and Context

The site was operated as a deep coal mine up to 1999 and was abandoned in 2000 following the removal of mine shaft machinery and capping of the shafts.

The site is currently subject to an implemented planning permission for an anaerobic digestion and glasshouse scheme (ref 12/03385/FULM). This permission involves the removal of existing buildings and structures on the site, with the exception of the existing substation and waste water treatment works, construction of an anaerobic digestion plant, combined heat and power plant and a large horticultural glasshouse. This scheme also involves remodelling of the existing northern screening mound and landscape proposals for the site. The footprint of the approved scheme broadly follows that of previous mine development and is contained within the York City Council administrative boundary.

The site access road and the northern part of the main body of the site lie within the York City Council administrative boundary whilst the southern part of the site lies within the boundary of Selby District Council. All parts of the site lie within the York Green Belt and are subject to Green Belt policies (see **Figure 2**).

Access

The site is accessed via a wide, metalled private road (New Road) that runs from an existing junction with the A19 in the west, south of Deighton, and connects into the western edge of the site (see **Figure 2**). Beyond the site, New Road continues north eastwards, providing private access to farms and residences that lie north and north east of the site, including Sheepwalk Farm, Sheepwalk Farm Cottages and Warren House Farm. New Road also provides access to Spring House Farm, west of the site.

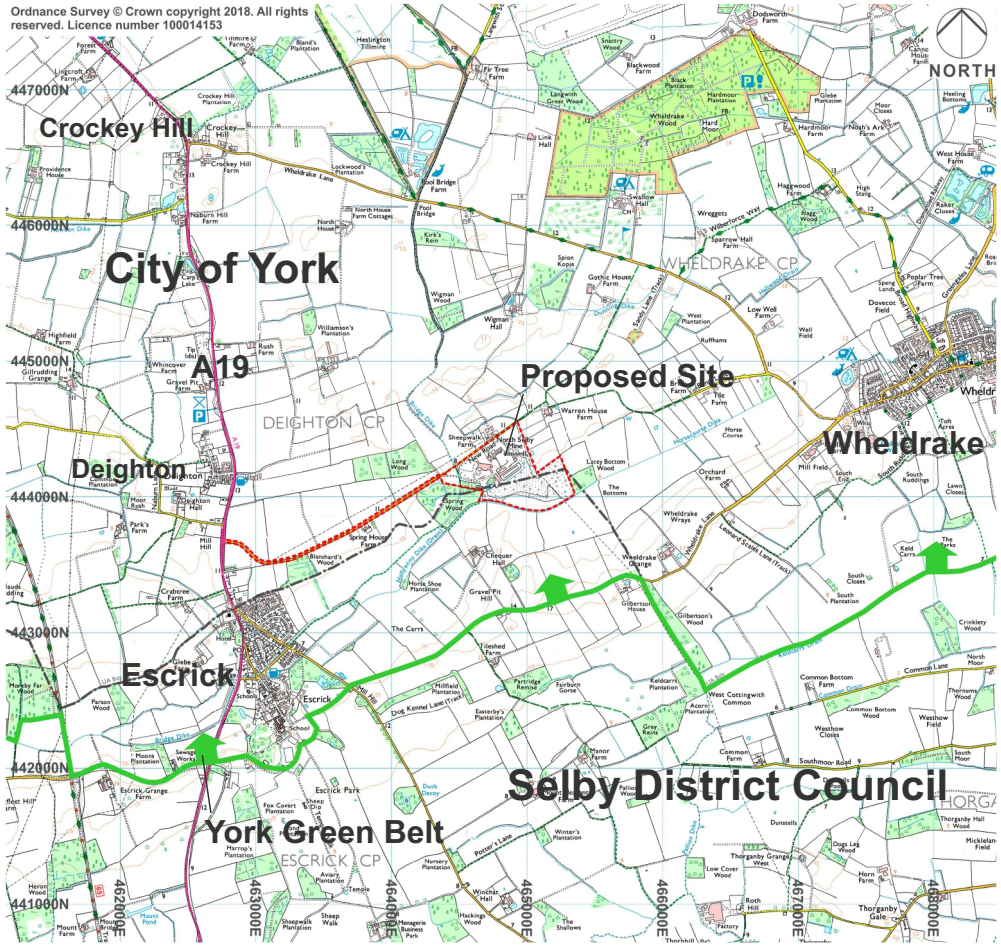


Figure 2: Access and Local Context

Several public rights of way connect into or run through the site as follows:

- footpath 35.28/2/1, which runs from Escrick in the south west and enters the site on its southern edge near the junction of Spring Wood/ Halfpenny Dike;
- bridleway 23/5/10 that runs along the site boundary immediately south of the existing waste water treatment plant before turning north along Bridge Dike through the western edge of the site to New Road in the north;
- bridleway 6/4/20 that runs along New Road, following the northern site boundary.

These rights of way form part of the Jorvik Way, a long distance orbital walking route that runs around York. The site is well connected to the local right of way network and also links to a number of other long distance routes including the Minster Way, the Wilberforce Way and the National Cycle Route 65/ Trans Pennine Trail, all as shown on **Figure 1**.

Public transport connection to the site is available via the 415 York-Selby bus service, with stops at Deighton, to the north of the site access road.

Local Context

Refer to **Figure 3**. The site lies within open countryside that is primarily in arable agricultural use. The land is relatively low lying and gently undulating, rising in the south to a low ridge associated with the Escrick Moraine glacial feature. Mature blocks of mixed woodland are characteristic of the local area and the boundaries of the site are bookended by Spring Wood in the west and Lacey Bottom Wood in the east. The area around the site is intrinsically dark at night.

Physical Site Features

The existing site, as at 2018, comprises the remains of the former deep coal mine including several buildings, former parking areas, extensive areas of hardstanding, lighting masts and columns, security fencing, demolition rubble mounds, surrounding screening mounds and partially restored spoil tip, topsoil and subsoil

Figure 3: Countryside Character

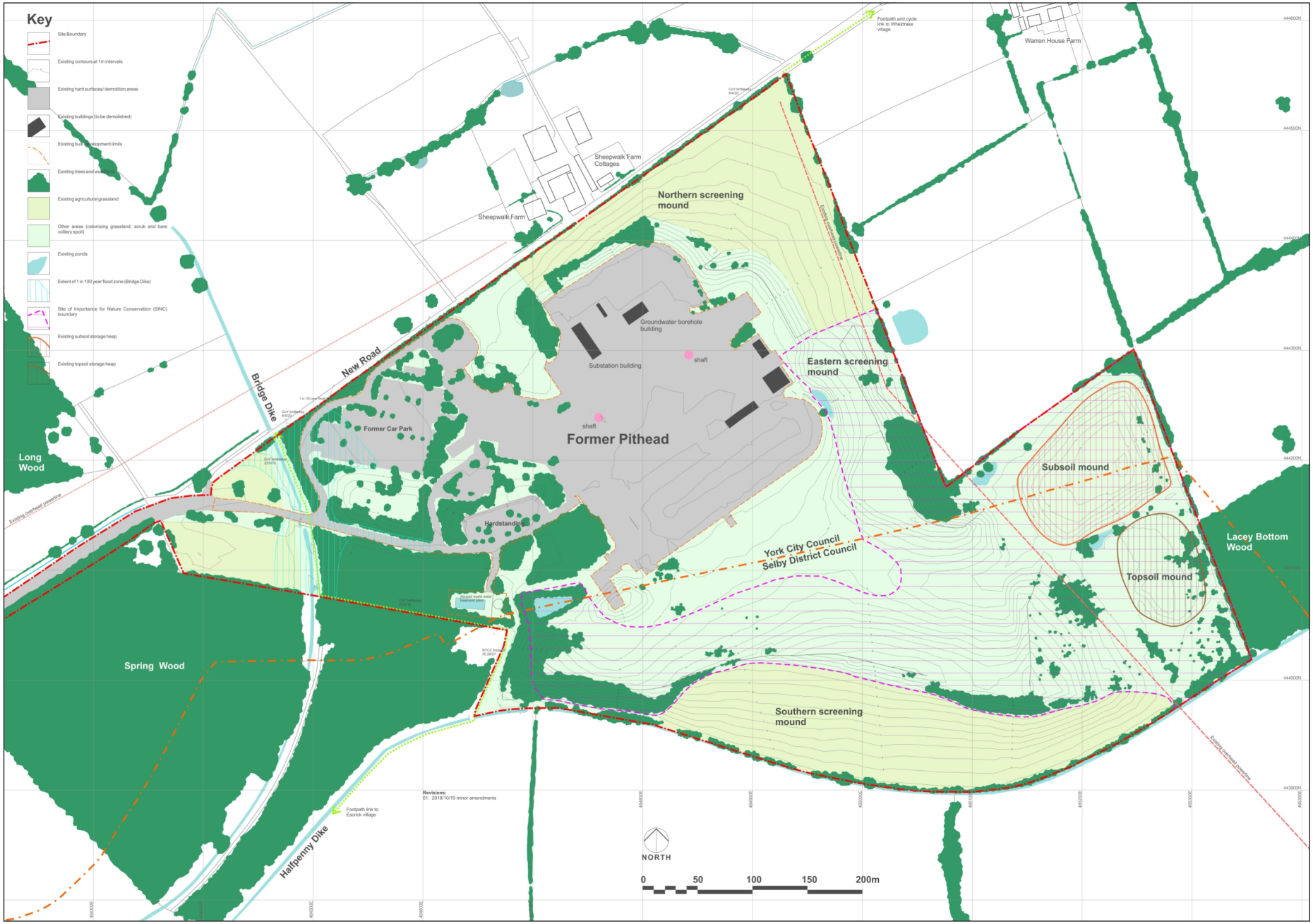


Figure 4: Existing Site

storage mounds, restoration planting, agricultural fields, ponds and woodland areas, extending to 36.4ha in total and as shown on **Figure 4** (drawing 2356.01) and **Figure 5**. **Figures 6-12** show photographs of the site as it stood in 2018. Of the total site area 12.4ha comprise existing built development, as shown on **Figure 4**.

The main body of the site, encompassing the former pithead, is contained by northern, eastern and southern screening mounds, with associated restoration planting. The outer faces of the northern and southern mounds are in use as agricultural grassland. At the eastern edge of the site former subsoil and topsoil storage mounds have been naturally colonised and re-assimilated into the landscape. In addition to the screening mounds, the site is contained by dense, mature or maturing tree and woodland cover (including Spring Wood) on its western and southern edges and by a thick, tall hedgerow along the northern boundary with New Road. Maturing tree and shrub cover now forms a series of interconnected spaces across former parking areas at the west edge of the site. The main body of the site remains relatively open, with large areas of hardstanding, stockpiles of demolition crushings, redundant buildings, lighting masts and fencing remaining. South and south east of the former pithead, a shallow 'valley' is formed between the eastern and southern screening mounds. Part of this area comprises a mosaic of bare spoil, open grassland and dense grassland cover and has been designated as a Site of Interest for Nature Conservation (SINC), as shown on **Figure 4**.

Landform

Refer to **Figure 5**. The landform of the site comprises relatively flat, low lying areas, at levels between 8-10 metres Above Ordnance Datum (m AOD) extending from the New Road entrance in the west and across the internal 'bowl' of the former pithead area. Several shallow mounds, rising to 11m AOD are present within former car park areas. Screen mounding ranges in height from 14.5-15m AOD along the northern boundary, between 16.8-17m AOD along the eastern boundary and between 14.7-21.3m AOD along the southern site boundary. Between the eastern and southern screening mounds a shallow valley, at levels between 9.6-11m AOD, extends south and east from the former pithead area. The valley landform peters out to low lying areas at original ground levels near Lacey Bottom Wood at the eastern edge of the site. Topsoil and subsoil storage mounds at the eastern edge of the site have created modified ground levels, rising to 10.9m AOD and 14.8m AOD respectively compared

Figure 5: Existing Site, Aerial Photograph & Levels

Figure 6: Site Entrance

Figure 7: Former Car Park

to original ground at levels between 6.4-8.2m AOD along the eastern site boundary. At the southern site boundary ground levels fall to 8.4m AOD along Halfpenny Dike.

Drainage

Refer to **Figure 4**. Bridge Dike cuts north-south through the westernmost edge of the site and Halfpenny Dike forms the southern site boundary. Surface water from the site is discharged to Halfpenny Dike.

A 100-year flood zone associated with Bridge Dike runs through the western edge of the site and affects the access road into the site. As part of the approved scheme proposals were approved to raise the site access road above the 100-year flood level and provide compensatory flood water storage capacity within fields at the western edge of the site.

Utilities

Refer to **Figure 4**. A 33kV overhead powerline, supported on wooden poles, runs broadly north-south through the eastern edge of the site. At the northern edge of the site, to the south of Sheepwalk Farm and Sheepwalk Farm Cottages, a section of this powerline runs below ground at the foot of the northern screening mound.
An electricity substation and groundwater borehole supply are contained within existing buildings at the northern edge of the former minehead within the site.
The former water treatment plant for the mine is located within young woodland on the south west edge of the site, near Spring Wood. Water from the treatment plant is discharged to Halfpenny Dike.

Figure 8: Former pithead from the eastern mound

Figure 9: Former pithead from southern mound

Figure 10: Former pithead from northern mound

Figure 11: Looking east from the southern mound

Figure 12: 'Valley' and former pithead from the southern mound

2.0 Site Analysis & Design Objectives

Development Requirements

The proposed scheme is intended to provide leisure accommodation at the site. Specialist market advice has confirmed that demand for leisure accommodation exists in the area and that the site is well located for this purpose being close to York and within easy reach of the North York Moors National Park and the Yorkshire Wolds. Access into York is available by public bus transport or by using the nearby Designer Outlet Park and Ride.

Leisure specialists have advised that the development should contain the following key elements:

- a hierarchy of zones for touring caravan/ campervan/ camping and glamping uses, static caravans and lodges and that these zones should preferably be accessed separately beyond the site entrance and should be visually independent of each other where possible;
- an emphasis should be placed on the static caravan element of the scheme, with this being the most important commercial driver for this type of development;
- a site reception facility supported by a small shop, café/ bar and toilet/ shower/ washing facilities;
- a well treed and green setting with water features if possible.

Supporting power supplies, water supply and waste water treatment facilities should also be provided.

The quantum of development at the site is to be guided by the natural carrying capacity of the site, using typical unit densities as follows:

- caravan/ campervan/ camping/ glamping – 25 pitches/acre (62/ha);
- static caravans – 15 pitches/ acre (37/ha);

Overall, a strongly man-made character is present across the core of the site. In contrast, well-developed tree cover, developing restoration planting, greened up screening mounds and naturally colonised soil storage mounds around the site perimeter combine effectively to assimilate the site into its rural setting within external views. **Figure 13** shows an analysis of the existing site.

Constraints

A number of specific constraints are present within the site that have a bearing on development. These include:

- the 100-year flood zone associated with Bridge Dike at the western edge of the site, where permanent built development within the flood zone would be undesirable;
- an overhead powerline running through the eastern edge of the site, where easement constraints would restrict development;
- capped former mine shafts, that should be avoided by permanent roads or permanent built development;
- public rights of way running through the western edge of the site, where obstruction or diversion of the rights of way should be avoided if possible.

Existing buildings and developed areas are not seen as a constraint to development and would be removed as part of site clearance and remediation works.

The relatively close presence of residential property at Sheepwalk Farm and Sheepwalk Farm Cottages, to the north of the site indicates that residential amenity should be taken account of during the design process to minimise or avoid adverse effects on residents. Discussion with residents has indicated that reinforcement of existing screening provided by the northern mound should be considered.

At a broader scale the central southern and easternmost part of the site has been designated as a SINC for its open mosaic habitat value. Ecology surveys have identified that the open mosaic habitat is more intact towards the eastern edge of this

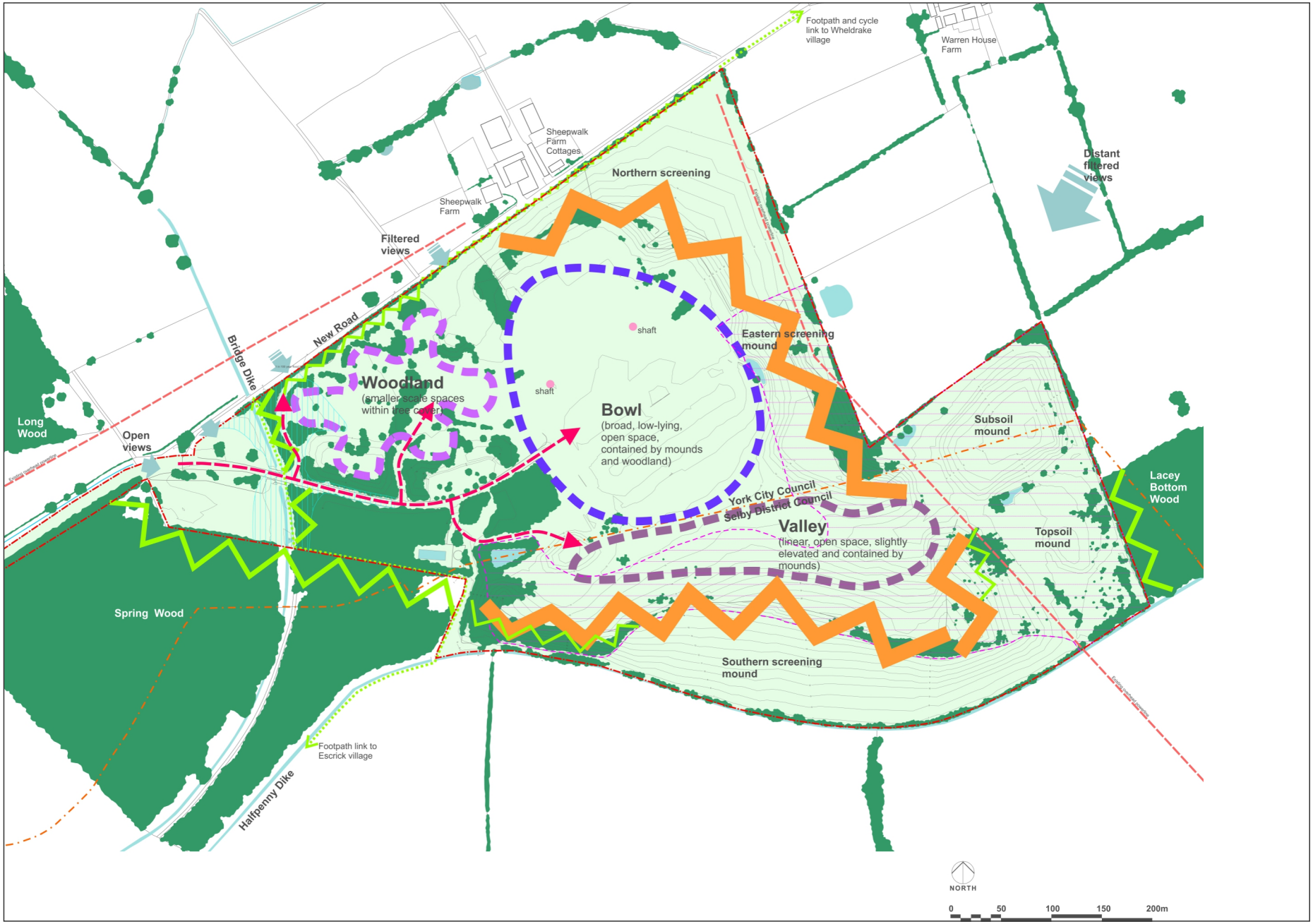


Figure 13: Site Analysis

area and less intact towards the west. Whilst the habitat associated with the SINC (open grassland mosaic) is transitory, scheme design should seek to minimise impact on the SINC and identify ways in which any impact could be mitigated and the open mosaic habitat managed in the long term.

The whole of the site lies within the York Green Belt, presenting a constraint to development in terms of avoiding impact on the openness of the Green Belt. In general, the core of the site is well-contained from surrounding views but fields at the westernmost edge of the site are clearly visible within close range views from New Road and public rights of way. The proposed design should seek to minimise adverse impact on surrounding countryside and on the Green Belt.

Agricultural fields on the outside flanks of the screening mounds are in beneficial use. Whilst not seen as a major constraint, design proposals should seek to retain agricultural use if possible.

Opportunities

The site presents a number of important opportunities that have been used to guide scheme design and that would help to integrate the proposed scheme into its setting:

- New Road provides good vehicular access to the wider road network and existing internal site access roads create an armature from which to extend access to different parts of the site;
- the site contains a well-screened core, enabling development to be accommodated within the heart of the site without significant impact on surrounding countryside character or perceived Green Belt openness;
- Woodland, Bowl and Valley character areas within the site lend themselves naturally to sub-dividing the identified leisure use hierarchy of touring pitches, static caravans and lodges into distinct zones;
- the site contains a good degree of mature and developing tree and shrub cover, creating an attractive setting for the proposed development and
- seek to balance potential impact on the SINC open mosaic habitat with development requirements, retain existing grassland and wetland habitats where possible, provide new habitats across the site and use locally native species throughout;
- provide specific visual screening measures for residents at Sheepwalk Farm and Sheepwalk Farm Cottages;
- use minimal lighting within the site to conserve local dark skies character;
- avoid placing permanent development within the 100-year Bridge Dike floodplain and raise the access road where it crosses the floodplain;
- retain surface water runoff within the site and only release to watercourses at normal agricultural runoff rates;
- provide walking routes within the site and create connections to surrounding public rights of way;
- retain existing agricultural uses within fields on the outer flanks of screening mounds.
- relocation of a proposed footpath connection to New Road including screening with a new hedgerow and provision of fencing to deter users of the site from walking up the inside face of the northern mound and avoid potential overlooking of residential properties.

Design Objectives

Using a combination of development requirements and the constraints and opportunities presented by the site a series of design objectives have been developed to guide scheme design. These objectives have informed the parameters plan and indicative masterplan for the site and should also be considered during the detailed design and reserved matters approval process. Design objectives adopted for the site are as follows:

- locate proposed leisure accommodation types (touring pitches, static caravan, lodges) within the three character zones identified at the site (Woodland, Bowl, Valley), provide separate access to each, provide visual separation between the zones and develop a different landscape identity for each zone;

- reuse the existing vehicular access road into the site and provide a single reception point, from where access to the different zones is then possible;

- ensure that proposed roads, accommodation units and buildings are located below existing mound ridgelines or are screened by existing tree and shrub cover, to minimise impact within surrounding views;

- retain and reinforce the existing landscape structure across the site, including reinforcement of woodland/ scrub planting on screening mounds to further reduce views into the site, increase wooded character within external views and improve habitat connectivity between existing woodlands;

- seek to balance potential impact on the SINC open mosaic habitat with development requirements, retain existing grassland and wetland habitats where possible, provide new habitats across the site and use locally native species throughout;

- provide specific visual screening measures for residents at Sheepwalk Farm and Sheepwalk Farm Cottages;

- use minimal lighting within the site to conserve local dark skies character;

- avoid placing permanent development within the 100-year Bridge Dike floodplain and raise the access road where it crosses the floodplain;

- retain surface water runoff within the site and only release to watercourses at normal agricultural runoff rates;

- provide walking routes within the site and create connections to surrounding public rights of way;

- retain existing agricultural uses within fields on the outer flanks of screening mounds.

4.0 Consultation & Design Development

The proposed scheme design has been developed in response to emerging project information and the following consultee and consultation responses:

- York City Council, pre-application letter of 20 August 2018;
- York City Council, EIA scoping opinion dated 11 October 2018;
- Public consultation events at Escrick (24 September 2018) and Wheldrake (26 September 2018).

In addition to the above, several meetings were held with residents of Sheepwalk Farm and Sheepwalk Farm Cottages to address potential visual impact within views from first floor rooms, potential visual impact on New Road and potential for overlooking from proposed footpaths within the site or from the northern mound.

The following iterative changes have been made to the scheme design as a result of the above consultation responses:

- removal of touring caravan areas and ancillary buildings from areas at the western edge of the site that lie outside existing woodland and landform enclosure;
- pulling back of the Valley lodges area at its eastern and southern edges, to reduce impact on nature conservation interests and reduce potential visual impact within filtered views from the north east;
- avoidance of clear felling within woodland glamping areas in favour of selective tree removal to create glamping glades whilst maintaining an overall woodland cover and increasing habitat diversity;
- enhancement of the northern screening mound including planting measures, partial extension of the mound and provision of a close board timber fence on part of the mound to enhance visual screening from residential properties;
- enhancement of screening along New Road including provision of enhanced planting and a close board timber fence along the northern site boundary, to reduce visual impact along New Road;
- relocation of a proposed footpath connection to New Road including screening with a new hedgerow and provision of fencing to deter users of the site from walking up the inside face of the northern mound and avoid potential overlooking of residential properties.

Figure 14 shows how the consultation process has influenced the extent of development being proposed at the site.

Escrick Public Consultation Event

Figure 14: Scheme Development

5.0 The Proposed Scheme

Parameters Plan

Figure 15 (drawing 2356.02) shows the parameters that have been assessed in the EIA process and that should be used to control detailed design proposals.

Footprint parameters are shown for the proposed accommodation zones. These extend to the following areas and translate to the following maximum numbers of accommodation units or pitches:

- Woodland, touring caravans/ campers – 1.49ha (92nr pitches);
- Woodland, glamping – 0.75ha (47nr pitches);
- Bowl – 6.87ha (254nr pitches);
- Valley – 1.64ha (41nr units);
- total development area – 10.75ha (434nr pitches/ units).

Maximum development height parameters for each zone are as follows:

- Woodland – 14m AOD to ridge (with the exception of site facility buildings);
- Bowl – 14.6m AOD to ridge;
- Valley – 5m above existing (2018) ground levels and up to a maximum ridge height of 19m AOD.

For future flexibility of design, and response to potential market conditions, the extent and boundary of character areas may be adapted as follows:

- the Valley area (lodges) may be extended into the Bowl area (static caravans), with associated adjustment of the internal screening provided between the two zones;
- touring and static caravan pitches within the Woodland and Bowl areas may be interchanged;
- only lodges may be sited within the Valley area indicated on the parameters plan;
- only glamping accommodation may be sited within the woodland glamping areas shown on the parameters plan.

Proposed site facility buildings would be subject to the following parameters:

- single storey design, maximum 7.5m height to ridge or 18m AOD;
- maximum total footprint (all buildings combined) of 350 square metres.

The northern mound extension and 2m high close board timber fence are incorporated as minimum fixed screening parameters.

Proposed woodland and shrub planting parameters are as shown on the drawing but would be subject to local variation at detailed design stage, subject to retaining the overall quantum of planting shown.

Drawing 2356.03, cross sections shows the development zone parameters related to existing and proposed mounding and planting.

Figure 15: Parameters Plan

Indicative Masterplan

Based on the parameters plan, an indicative masterplan has been prepared to illustrate the potential layout of the site, refer to **Figure 16** (drawing 2356.04).

The proposed scheme would re-develop the former mine site as a leisure proposal. The site would be developed as a visually self-contained scheme using existing landform and vegetation cover combined with new landscape interventions, to create three distinct character zones:

- Woodland, developed amongst existing mature tree and woodland cover at the western edge of the site;
- Bowl, developed across the flat, enclosed bowl created by the former pithead within the middle of the site, with a light woodland character to be created;
- Valley, formed along the valley landform created by mining to the south and east of the site, with a more open character of trees adjacent to lodges with open grassland between.

Each character zone would accommodate a different type of leisure accommodation. The Woodland area would contain touring caravan, camper van and glamping uses, the Bowl would hold static caravans and the Valley would contain lodges. An internal landscape buffer, incorporating tree planting, ponds and grassland would be provided to create separation between the Bowl and Valley zones.

The scheme would be constructed in phases, broadly from west to east, with part of each character zone being initially developed, supported by appropriate facilities buildings. The pace of implementation would be dependent on market conditions and the demand for each type of accommodation.

Existing hard surfaces and foundations would be broken out and existing buildings demolished. Arisings would be crushed and graded as recycled aggregate for use within the site with any surplus exported to market.

Access to the development would be from the A19, utilising the existing New Road junction and road. Existing approach roads within the site would be retained and extended using recycled site aggregate to create an informal network of stone surfaced routes allowing vehicle access to accommodation and pitches. Pitches, parking areas and footpaths would also be surfaced with recycled site aggregate. For glamping areas, access to pitches would be by foot only, with car parking provided elsewhere within the Woodland zone.

Site facilities buildings would be low key, only containing uses typically required to support this type of leisure development. These uses would include a reception and small shop at the site entrance, toilet/ wash blocks and a possible café/ licensed bar, all set within the Woodland zone. Architectural design of the facility buildings would either be of traditional red brick and red pantile construction (as seen at Sheepwalk Farm) or contemporary design incorporating natural and/or visually recessive materials (for example timber clad walls with cedar shingle or matt aluminium/ zinc roof cladding). Crushed stone and precast concrete paver surfaces would provide local access to facility buildings. Proposed lodges would be single storey and constructed from natural and visually recessive materials.

A series of informal footpaths would be created through the site, with links to the surrounding public right of way network, including the Jorvik Way and other long distance routes, and providing access to nearby villages including Escrick and Wheldrake. Existing public rights of way running through the site would be retained on their existing alignments. Subject to detailed design, permissive public access would be provided to footpath routes around the perimeter of the site, including to the wildlife area.

Utility supplies would either re-use or adapt existing facilities or would be brought to site via the existing access road. Waste water management would involve adaptation or replacement of the existing treatment plant. Surface water and treated waste water outfall would be to Halfpenny Dike, using existing arrangements.

Part of the site, including a section of the access road, lies within the 100-year flood zone associated with Bridge Dike. Road levels would be raised locally and compensatory flood storage capacity provided within fields west of Bridge Dike. No permanent structures would be placed within the floodplain; however, parts of the floodplain would be used for mobile caravan/ camper van pitches.

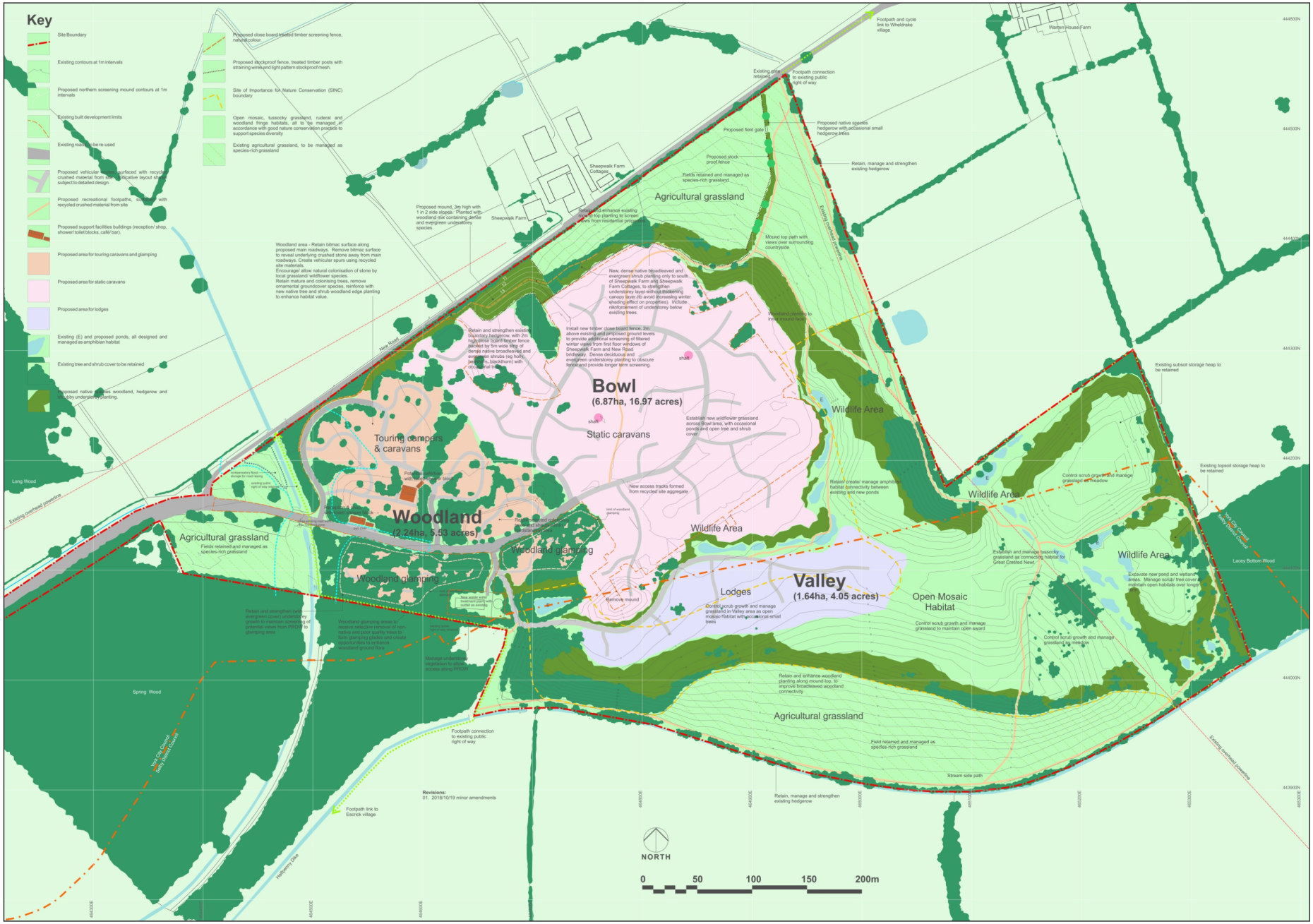


Figure 16: Indicative Masterplan

The site landform would be retained primarily as existing. Localised regrading would be undertaken to remove occasional mounds and stockpiles, form ponds and to create level platforms for structures. Existing landscape mounds within the Woodland area would be regraded to shallower gradients where necessary to allow access to pitches. A small extension of the northern mound, with associated close board fencing and screen planting, would be provided, to improve visual screening and privacy for properties to the north of the site, as agreed with residents.

Surface water drainage within the site would be managed through a combination of using green and permeable surfaces to allow natural infiltration, supplemented with collection swales and ponds. Existing permitted discharge points and flow rates would be retained in the proposed scheme.

Lighting within the site would be low key, for guidance purposes only. Low level bollard lights would be used to indicate the main access road within the site. Downlights would be used to identify toilet/ shower blocks. Existing light columns and masts would be removed.

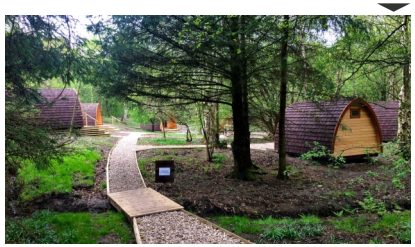
Landscape and biodiversity are major components of the scheme, creating an attractive setting for the development and assimilating the development and the site into the surrounding countryside and habitat network. Existing nature conservation interests would be protected through ongoing management and compensatory habitat creation and/or management measures. Open mosaic habitat would be managed to improve existing value. Existing amphibian ponds and habitat would mostly be retained with new ponds and terrestrial habitat provided within linked corridors. Existing agricultural grassland on the outer flanks of the site would be managed to encourage sward diversity and wildflowers. Locally native tree and shrub species would be used throughout the scheme and existing non-native or inappropriate species near the former pithead would be progressively removed and replaced with native species. Landscape design of the site, and the location of accommodation units and pitches, would create an external appearance of woodland and open countryside, in keeping with existing surrounding landscape character and Green Belt setting.

Within the woodland glamping zones selective removal of non-native, inappropriate or poor specimens would be undertaken, to establish space for glamping units,

Figure 17: Woodland Zone - Indicative Layout

Touring caravans & camping

Woodland glamping



footpath access and to allow improvement of understorey and ground flora habitats. No-dig construction techniques would be used within tree root zones. Habitat diversity would be achieved though ongoing management, with an emphasis on encouraging the spread of ground flora from adjoining semi-natural woodland at Spring Wood.

For indicative layouts and landscape treatments of the three accommodation zones refer to **Figure 17** (drawing 2356.05, Woodland), **Figure 18** (drawing 2356.06, Bowl) and **Figure 19** (drawing 2356.07, Valley).

Appendix 1 sets out typical planting and seeding mixes, including species, size and density, that would inform detailed design proposals.

Management of landscape and biodiversity resources within the site generally would be provided to ensure that design and EIA objectives are met, enabling the site to contribute positively to its landscape and ecological context in addition to providing a high-quality setting for leisure use.

Typical static caravans

Traditional lodges

Contemporary lodges

Figure 18: Bowl Zone - Indicative Layout

Figure 19: Valley Zone - Indicative Layout

Appendix 1: Landscape Treatments

1. Introduction

This statement provides an outline specification for of proposed landscape treatments including basic cultivations; types, species, sizes and densities of planting; plant protection measures; seeding works and establishment maintenance operations. Full details of landscape works would be submitted and agreed as part of reserved matters applications, subject to approval of the outline planning application.

2. Factors Affecting Design

The existing site is located in a rural setting and is expected to be subject to predation by rabbits, hares and voles. Fields around the edges of the site are used for agricultural grassland cultivation but may be used by grazing livestock from time to time.

The site is located inland at relatively low levels and is therefore not expected to be subject to extreme level of exposure.

Ground conditions at the site range from natural soils to thin soil cover over coal measures substrates (shales, clays and colliery spoil washings remaining from previous mining activity) or exposed coal measures substrates. Acidic ground conditions may be experienced across coal measures substrate areas with neutral soil conditions expected in other areas.

Public access into parts of the site, and access by site occupants in all areas of the site is expected. User numbers are not expected to be high enough to affect normal planting measures and high levels of vandalism are not predicted, being located away from urban areas.

Planting and seeding design will respond to site conditions including substrate, moisture and aspect conditions in addition to meeting design objectives such as achieving effective visual cover and biodiversity aims. Within this general context, detailed landscape design will aim to develop different vegetation characters across the proposed woodland, bowl and valley development zones.

3. Implementation Techniques

Tree Survey and Establishment of Root Protection Zones

At the outset of the detailed design process a tree survey conforming to BS 5837 would be prepared, identifying trees of particular merit and root protection areas (RPA) for all groups of trees proposed to be retained. RPAs would be demarcated with appropriate temporary protective fencing and mobile plant access, storage of plant or materials and ground level changes would not be permitted within the RPAs.

Non-native tree species would be identified, with a view to removal during initial construction works or targeting for removal through longer term management where it is desirable to retain existing cover/ maturity until such time as replacement native planting has been established.

Site Clearance and Protection Works

All site clearance and construction works would be subject to ecological survey and checking and seasonal timings including:

- felling of trees and removal of unwanted colonising vegetation outside the bird nesting season;

- checking for ground nesting birds in areas of proposed earthworks and cultivations;

- checking of mature trees with potential for roosting bats before felling or other tree surgery works;

- checking for amphibians and water vole burrows in wetland areas and adjoining terrestrial habitats.

Root protection zones (RPZ) would be established around the outer canopies of all existing trees and hedgerow to be retained where they abut proposed brook diversion works or employment park works. No mobile plant access, storage of plant or materials and ground level changes would be permitted within the RPZ.

Large section (>100mm in diameter) felled timber would be cut to 2m lengths and stacked to form deadwood habitat piles close to ponds and within existing woodland areas.

Rubble arisings and timber would also be used to form hibernacula for amphibians at regular interval across the site, to encourage movement between ponds.

Soils and Cultivations

All operations would be carried out during suitable weather conditions in accordance with standard industry guidance (eg "Good Practice Guide for Handling Soils", MAFF, 2000, or successor document).

Within more heavily used parts of the site where original soils are present neutral grassland areas would be established directly onto existing soils using a proprietary seed mix. For grassland areas on existing exposed coal measures substrates are present or where these are exposed by regrading works areas a mosaic of substrates would be established, ranging from bare coal measures material to areas receiving thin subsoil cover (0-150mm), with the purpose of establishing patchwork of low nutrient acidic grassland, neutral grassland and bare substrates. Existing naturally colonising acidic grassland would be retained where possible and natural colonisation of exposed soils encouraged. Across large parts of the site, demolition and clearance works would expose underlying subsoils, clays and areas of these materials mixed with crushed stone or demolition crushings. Within these areas the aim would be to establish species-rich low nutrient neutral grassland, again with the aim of encouraging natural colonisation. A low sowing density of native grassland nurse species may be used to provide initial binding of soils and greening of the site. This mix would be designed to support ongoing natural colonisation.

The above principles would be adapted to encourage the development of different sward types across the three development zones, broadly as follows:

- Woodland zone – shady neutral grassland and woodland edge/ ground layer species;
- Bowl – neutral grassland;
- Valley – acid grassland/ neutral grassland/ bare ground mosaic.

The proposed northern mound extension would be formed from a core of compacted inert material capped with a 300mm deep layer of topsoil placed using loose tipping methods, to avoid surface

compaction. The surface of the inert core would be loosened/ scarified to 300mm depth prior to placing the topsoil layer. Prior to planting the mound would be sown with a woodland area mix, to bind the soil surface, green up the mound and reduce weed competition for young plants.

Within proposed woodland planting areas existing soils would be inspected to determine the degree of surface compaction present. Where compaction is not identified as being a problem planting would be direct into existing soils. Where compaction is identified as a problem, planting areas would either be ripped to 600mm depth at 1000mm centres with a winged tine followed by surface cultivation using 300mm curved tines at 300mm centres or would be loosened to 600mm depth by excavator bucket. The aim of both techniques would be to loosen the soil surface to relieve compaction ahead of planting.

Woodland and Scrub Planting

Where existing surface vegetation cover is not present woodland planting areas would be sown with a grass mix to bind the soil surface and reduce weed competition. Wild white clover and bird's-foot trefoil would be included in the mix to fix nitrogen and provide nectar sources. Seeding would be by broadcast methods using low ground pressure tractors to minimise soil compaction. No fertiliser would be applied.

Woodland Area Grass Mix (application rate 3gms/m2)		
Festuca arundinacea	tall fescue	10%
Festuca rubra	red fescue	35%
Festuca filiformis	fine-leaved sheep's fescue	25%
Poa pratensis	smooth stalked meadow grass	20%
Trifolium pratense	red clover	8%
Lotus corniculatus	bird's-foot trefoil	2%

Based on a combination of NVC W10 habitat typology and inclusion of rapid growing willow and poplar species as a nurse crop woodland mixes are proposed below. Ash is not included within any mixes at this stage due to the potential effects of ash dieback disease. Should ash dieback recede or suitable immune plants become available during the course of the project planting mixes would be amended to include ash.

Native Broadleaved Woodland Mix, average density 2500nr plants/hectare				
Botanical Name	**Common Name**	**%**	**Size (cm)**	**Type**
Quercus robur	pedunculate oak	30	20-40	BR*
Betula pendula	silver birch	25	45-60	BR
Crataegus monogyna	hawthorn	15	20-40	BR
Salix caprea	goat willow	15	60-90	BR
Corylus avellana	hazel	5	45-60	BR
Ilex aquifolium	holly	5	30-45 min 3 breaks	2L pot
Prunus avium	wild cherry/ gean	5	45-60	BR

The above woodland mix would be used on the northern mound extension at a density of 5000nr plants/ hectare to achieve early cover and knitting of plant growth across the mound.

Subject to further investigation of soil conditions on the existing screening mounds part of the oak component of the mix may be replaced with Alnus glutinosa if it is considered that this would enhance initial growth rates and establishment of cover across these areas.

*BR denotes bare root planting stock

Within woodland edge and open scrub/ grassland areas the following mixes would be used:

Native Broadleaved Woodland Edge Mix (adapted from NVC W10), average density 1500nr plants/hectare, in random groups and clumps with open grassland between				
Botanical Name	**Common Name**	**%**	**Size**	**Type**
Crataegus monogyna	hawthorn	30	20-40	BR
Betula pendula	silver birch	20	45-60	BR
Salix caprea	goat willow	15	60-90	BR
Corylus avellana	hazel	10	45-60	BR
Prunus spinosa	blackthorn	10	20-40	BR
Ilex aquifolium	holly	5	30-45 min 3 breaks	2L pot
Malus sylvestris	crab apple	5	45-60	BR
Viburnum opulus	guelder rose	5	45-60	BR

Native Dense Scrub Mix, average density 3000nr plants/hectare				
Botanical Name	**Common Name**	**%**	**Size**	**Type**
Crataegus monogyna	hawthorn	45	20-40	BR
Prunus spinosa	blackthorn	25	20-40	BR
Salix caprea	goat willow	20	60-90	BR
Rosa canina	dogrose	10	45-60	BR
Viburnum opulus	guelder rose	5	45-60	BR

Native dense scrub mix would be used to supplement existing tree cover on the northern mound to the front of Sheepwalk Farm Cottages, where strengthening of the shrubby layer is desirable but thickening of the canopy layer is to be avoided (to avoid reducing winter light reaching the properties).

Several areas of the site are low lying and may be expected to develop wetland or damp woodland characteristics. Planting mixes for these areas and zones adjacent to proposed ponds would be as follows:

Native Broadleaved Wet Woodland Mix (adapted from NVC W6), average density 1500nr plants/hectare				
Botanical Name	**Common Name**	**%**	**Size**	**Type**
Alnus glutinosa	alder	50	45-60	BR
Salix cinerea	grey willow	20	60-90	BR
Salix fragilis	crack willow	20	60-90	BR
Betula pubescens	downy birch	10	45-60	BR

All plant species to be planted direct into spread soils, including excavation of planting pit to allow roots to be fully spread. Plant handling and planting operations would be carried out in accordance

with good horticultural practice during the November – March planting season during periods when the ground is not waterlogged or frozen.

UK origin planting stock would be used throughout. If available, local nursery stock, grown from local seed sources, would be used as a preference.

All plants would be protected from rabbit and vole damage with suitable clear or green plastic grow tubes with support stakes. Rabbit proof fencing may be appropriate across parts of the site, for example along the northern mound and northern mound extension, and may be used in favour of grow tubes in these areas.

Individual Trees and Tree Groups Within Development Zones

Individual feathered trees would be established within the development zones to soften the appearance of proposed structures and establish varying degrees of longer-term woodland and tree cover across the site, as follows:

- Woodland zone – Quercus robur (Oak);
- Bowl zone – Betula pendula (Silver Birch), Alnus glutinosa (Alder), Salix caprea (Goat Willow) and occasional Quercus robur (Oak);
- Valley zone – Betula pendula (Silver Birch) and Salix caprea (Goat Willow)

Individual trees would be planted at a range of sizes between 1.5 – 2.5m height and as bare root stock. Trees would be planted into pits excavated to 900mm diameter x 600mm and backfilled with a mixture of excavated soils, 20L of tree and shrub planting compost and 130gms of general-purpose slow release fertiliser. Trees would be supported by treated softwood knee stakes with adjustable rubber ties and blocks. Tree planting stations would receive bark mulch covering 900mm diameter x 75mm settled depth.

Hedgerows and Hedgerow Trees

Planting details for new hedgerows and supplementary hedgerow planting (for example reinforcement of existing boundary hedgerows) are as follows:

Hedgerow Planting Mix, 6 plants per lin/m

Botanical Name	**Common Name**	**%**	**Size**	**Type**
Crataegus monogyna	hawthorn	50	20-40	BR
Prunus spinosa	blackthorn	20	20-40	BR
Corylus avellana	hazel	10	45-60	BR
Salix caprea	goat willow	10	60-90	BR
Viburnum opulus	guelder rose	5	45-60	BR
Ilex aquifolium	holly	5	30-45 min 3 breaks	2L

Occasional Hedgerow Trees (at an average rate of 1nr tree per 10m length of hedgerow)

Botanical Name	**Common Name**	**Size**	**Type**
Malus sylvestris	crab apple	1.8 - 2.4m feathered	BR
Prunus avium	wild cherry/ gean	1.8 - 2.4m feathered	BR
Quercus robur	pedunulate oak	1.2 – 1.5m feathered	BR

Hedgerow species would be planted direct into existing ground after clearance of existing weed and grass cover to 900mm wide along the line of the hedge, rotavation to 200mm depth and incorporation of 50mm settled depth approved type planting compost. 75mm settled depth approved type bark mulch would be applied 900mm wide along the line of the hedge after planting. All species would be protected with approved type grow tubes except Ilex, which would be enclosed in 200mm diameter staked mesh guards.

Hedgerow planting would be in double rows, 300mm apart, in random groups of 3 – 7 of any single species, with Ilex planted individually at random distances. All species would be cut back to 200mm after planting to encourage strong bushy growth.

Hedgerow trees would be planted direct into existing ground in prepared pits 600mm diameter x 600mm deep, including incorporation of 15 litres approved type tree and shrub planting compost and 60gms compound slow release fertiliser into pit backfill. Angled knee stake support with adjustable rubber tie would be provided. A 75mm diameter x 2000mm treated softwood stake with white painted tip would be driven firmly into the ground beside each tree, to act as marker to prevent cutting of tree during hedge trimming works in early stages of tree growth.

New hedgerows would be allowed to reach a design height of 2m before commencing cutting, after which they would be developed in shape to match existing adjoining hedgerows.

Neutral and Acidic Grassland

Neutral and acid grassland areas would generally be established by allowing natural colonisation of soils to occur.

In some areas, however, including steeper slopes, track verges and areas close to accommodation units, seeding would be required. In these locations a proprietary seed mixture would be used with the aim of achieving MG1/MG5 swards, subject to management operations.

Neutral Grassland & Wildflower Mix (application rate 3gms/m2)		
Grasses (82% by weight)		
Festuca rubra ssp rubra	strong creeping red fescue	22%
Cynosurus cristatus	crested dogtail	18%
Agrostis capillaris	common bent	14%
Dactylis glomerata	cocksfoot	14%
Festuca pratensis	meadow fescue	6%
Trisetum flavescens	golden oat grass	6%
Anthoxanthum odoratum	sweet vernal grass	2%
Wildflowers (18% by weight)		
Plantago lanceolata	ribworth plantain	2%
Achillea millefolium	yarrow	1%
Centaurea nigra	common knapweed	1.5%
Filipendula ulmaria	meadow sweet	1.5%
Galium verum	lady's bedstraw	1%
Leucanthemum vulgare	ox-eye daisy	1.5%

Knautia arvensis	field scabious	1%
Prunella vulgaris	selfheal	1.5%
Ranunculus acris	meadow buttercup	1.5%
Ranunculus bulbosus	bulbous buttercup	1%
Agrimona eupatorium	agrimony	1%
Leontodon autumnalis	autumn hawkbit	1%
Rhinanthus minor	yellow rattle	1%
Lotus corniculatus	bird's-foot trefoil	0.5%
Daucus carota	wild carrot	1%

Seeding would be undertaken during the spring or autumn sowing periods.

Herbicide treatment would be used to kill any existing perennial or pernicious weeds (eg couch grass, creeping thistle, ragwort, dock, nettle) prior to cultivation and sowing. Use of herbicides near ditches and ponds would be in accordance with Guidelines for the use of Herbicides on Weeds in or near Watercourses and Lakes" (PB 2289), September 1995 or successor guidance.

A fine seed bed would be prepared through harrowing and rolling. Seeding would be carried out using tractor mounted broadcasters followed by rolling to ensure good contact between the seed and soil. No fertiliser would be applied to seeded areas.

A first cut would be undertaken approximately 8-12 weeks after sowing or when the sward reaches a height of 150mm, to encourage tillering. Arisings would be removed.

Access Tracks, Pitches, Footpaths, Fencing and Gates

Vehicular access tracks, bridleways and footpaths would be constructed as follows:

- vehicular access tracks – 3m wide with passing places, with 300mm compacted depth of recycled Type 1 stone surface on Terram 1000 geofabric laid directly on compacted subsoil, with additional Type 1 stone sub-base to be provided where existing soils cannot support vehicle loading requirements;

- footpaths/ bridleways/ cycleways – 1200mm wide with 150mm compacted depth of recycled Type 1 stone surface on Terram 1000 geofabric laid directly on compacted subsoil or overburden.

Accommodation pitches would be surfaced with recycled Type 1 stone aggregate to 150/200mm compacted depth on Terram 1000 geofabric, laid directly onto compacted ground.

Existing topsoil would be removed from all access tracks and paths before construction, with arisings spread locally or re-used in other parts of the site.

Proposed hedgerows adjoining existing fields would be protected using stockproof fencing. 150mm diameter treated timber straining posts with 100mm diameter intermediate posts would support standard pattern stockproof mesh supported on tensioned wires with two strands of barbed wire.

Proposed close board timber fencing along the northern boundary would be constructed from sawn treated softwood, with 100mm x 100mm posts and triple 100mm x 50mm rails supporting 25mm x 100mm vertical close-butted boards facing outwards, to achieve 2m height above proposed ground levels. Posts would be set in 300 x 300 x 900mm deep concrete footings.

A standard pattern galvanised heavy duty steel field gate would be provided to link the two agricultural fields where a hedgerow is proposed at the eastern edge of the north mound. The same gate style would be used should external gates be needed elsewhere on the site.

Ponds, Wetlands and Ditches

Proposed amphibian ponds would be excavated to varying profiles from 0.1m to 1m deep, with varied edge gradients (between 1 in 1 and 1 in 10) and limited sections of deeper sumps or trenches, to create a wide range of permanent ponds, seasonal ponds and fringing marsh and bog areas. Ponds would be placed at varying densities, with interlinking tall grassland, open scrub and woodland edge areas to provide habitat continuity and amphibian movement corridors across the pond network.

New ponds would either be formed by compacting existing substrates where clay subsoils are present or by installing a new compacted clay lining 300mm deep using material excavated from elsewhere on site.

Proposed pond and marsh areas would generally be left to colonise naturally. Advance planting with selected species could be undertaken to provide some ponds with an initial structure to establish an emergent zone (eg using common reed *Phragmites* and reed canary-grass *Phalaris arundinacea)* or to establish submerged oxygenators (eg spiked water milfoil *Myriophyllum spicatum*). Inoculation with plants and mud from existing site or nearby ponds would also be considered if a suitable donor site is available. Donor sites would be checked for invasive aquatic species including fish before being considered suitable.

Bird and Bat Boxes

Bird and bat boxes would be installed at secure locations to support target species and encourage bird and bat movement across the site.

9. Maintenance and Management

The proposed scheme would be subject to a period of initial establishment maintenance followed by ongoing long-term habitat and site management. An integrated landscape and ecological management plan would be produced to guide development of the site. It is anticipated that production of the management plan would be required by conditions attaching to any outline planning permission. The typical range of issues covered by a management plan is set out below.

Establishment Maintenance & Aftercare

All areas of the site would be subject to a 5 year aftercare period to ensure correct establishment of proposed habitats. Key establishment and maintenance operations would include:

- beating up of woodland and woodland edge planting areas to ensure a 100% minimum establishment rate of the original planting numbers;

- maintenance of a 900mm diameter weed and grass free zone around each tree and shrub planting station for 36 months after planting;

- maintenance of a 900mm wide weed and grass free zone along newly planted hedgerows for 36 months after planting;
- checking and firming of grow tubes, stakes ties;
- checking and repair of access tracks, footpaths and stockproof or rabbitproof fencing;
- annual mid-late July or August cutting back of species-rich grassland areas, after seed has set and fallen, with arisings to be removed;
- eradication of notifiable or pernicious weeds across all parts of the site;
- no fertilisers or other nutrients would be applied to any areas;
- making good of path surfaces should settlement or erosion occur;
- litter picking and removal of any rubbish would be undertaken at regular intervals.

Long Term Management

All habitats would be managed for nature conservation purposes and to achieve landscape objectives (for example screening or character development). Management would be guided by a management plan that would be flexible and targeted towards supporting key habitat types, eg oak/birch woodland, acid grassland, neutral grassland, wetlands and key species eg bat, amphibian and bird populations.

Woodland thinning would be undertaken at approximately year 15 after planting, with the aim of increasing habitat diversity and establishing oak as the climax species. Sufficient woodland density would be retained to maintain visual screening capacity.

Hedgerows would generally be cut annually, with weak areas replanted or layed to maintain cover. Some sections of hedgerow would be allowed to grow tall and bushy to increase biodiversity value.

Some management of tree and shrub cover would be required along the overhead powerline corridor through the site, to maintain safe electrical clearances.

Watercourses and ditches would be cleaned and cleared to maintain flow with specific waterside habitat management undertaken to encourage local amphibian populations including cutting back of excess scrub growth and cutting to create a layered mosaic of bankside grassland. Pond side vegetation would be cut back on a rotational basis (20% per annum) to develop structural and age diversity.

Species-rich grasslands would be managed as low-nutrient/ species-rich swards through annual cutting with removal of arisings and no application of fertilisers. Some areas of rank grassland or tall ruderal vegetation may be allowed to develop subject to biodiversity objectives.

General repair and maintenance operations across the site would include litter collection and repair of fencing and paths.