University of Reading

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Loddon Valley Garden Village Allocation: Landscape and Visual Review

Wokingham Borough Local Plan Update 2023-2040
Proposed Submission Plan: Consultation

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Appendices

1. Introduction

1.1 Savills have been instructed by the University of Reading to reviews the 'Wokingham Borough Council Local Plan Update 2023 – 2040 Proposed Submission Plan' as part of the Regulation 19 Consultation (the 'LPU') with particular reference to landscape and visual matters. In particular this report reviews how the LPU and its associated evidence base relates to the proposed Loddon Valley Garden Village draft allocation (the 'LGV') and its associated Country Park.

1.2 The focus of our work is within the red line shown on the drawings in Appendix 1. This includes the proposed LGV and Country Park together with the partially complete Thames Valley Science Park ('TVSP'). We refer to this area as the 'site'. Whilst we focus on land owned by the University of Reading, we also consider implications of the LPU on land owned by Gleeson Land and Hatch Farm Land Ltd that form part of the Loddon Valley Garden Village draft allocation.

1.3 The report has been undertaken by Savills Urban Design Studio and carried out by a Chartered Member of the Landscape Institute and Urban Design Group Recognised Practitioner. It is based on a series of desk-based surveys and site visits. The photographs provided in Appendix One were taken in 2022 during the winter months. They were taken with a full frame digital SLR using a 50mm lens, in compliance with Landscape Institute Technical Guidance Note 06/19 'Visualisation of Development'.

1.4 Whilst the report does not constitute a Landscape and Visual Assessment, it has been informed by the 'Guidelines for Landscape and Visual Appraisal' 3rd edition (The Landscape Institute and IEMA, 2013) ('GLVIA3) methodology and takes into account potential landscape and visual receptors that may be affected by the development and the how mitigation may reduce potential effects.

1.5 This report summarises work that Savills has already undertaken in relation to landscape and visual effects and the design of the LGV. It uses this baseline knowledge to review the emerging policies in the Local Plan Update. This includes the LGV proposals set out in Policy SS13 of the Local Plan Update and the associated Figure 8 Concept Plan prepared by David Lock Associates on behalf of Wokingham Borough Council ('WBC') (page 85 of the LPU).

2. Summary of Landscape and Visual Analysis Undertaken to Date

2.1. Introduction

2.1.1. The University of Reading have commissioned Savills to undertake baseline surveys of the LGV and TVSP area and feed into the masterplanning process described in the University's Vision Document for the LGV. We have worked on the project since 2022 and have an in-depth knowledge of the site and the evolving design aspirations for it. This input has sought to ensure that the proposed development would minimise effects on landscape and visual amenity and provide opportunities to make enhancements to the landscape. This has included input to the strategic design of public open spaces within the housing area as well as a new Country Park and Suitable Alternative Natural Greenspace (SANG) along the River Loddon.

2.1.2. The methodology for our work has been informed by the GLVIA3 and we anticipate that a Landscape and Visual Impact chapter would be required within an Environmental Statement that may accompany any future planning applications.

2.1.3. As part of our ongoing work relating to landscape assets and effects we have:

- reviewed existing and emerging landscape designations on and adjacent to the site;
- reviewed published landscape character assessments relating to the site;
- prepared our own more detailed landscape character assessment of land within the site;
- reviewed key landscape features within and adjacent to the site, such as terrain, water features, public rights of way, land use and vegetation;
- undertaken site visits to test the potential extents of visibility of the proposed development.

2.2. Existing and Emerging Landscape Designations

2.2.1. Designations are shown on Figure 1 (Appendix 1).

2.2.2. There are no national designations relating to landscape or visual amenity covering the Site, however parts of the Site lie within the 'River Loddon' and 'Barkham and Bearwood' draft Valued Landscapes, covered by Policy NE6 of the LPA. We consider the implications of this draft designation in Section 3 below.

2.2.3. There are a number of designated heritage assets within and immediately adjacent to the site. These include the Grade II listed St Bartholomew's Church and Hall House Farmhouse and the St Bartholomew's Scheduled Monument, as well as listed buildings on Cutbush Lane, at Carter's Hill and along Mole Road. The Bearwood College Registered Park and Garden lies beyond the site boundary, to the east. The value of these assets, and potential effects on their settings is covered by the RPS Heritage team, however they have been an important consideration in the design of the masterplan and its landscape structure. All listed buildings would be retained, and new development designed to respect the settings of the assets.

2.3. Baseline Landscape Character

2.3.1. Two published Landscape Character Assessments cover the study area:

- National Landscape Character Assessment (Natural England, updated 2014)
- Wokingham Borough Landscape Character Assessment (LUC, on behalf of Wokingham Borough Council, 2019) (the 'Wokingham Landscape Assessment'),

2.3.2. The Wokingham Borough Landscape Character Assessment (2019) forms part of the Evidence Base for the Local Plan Update. We have reviewed this document in Section 3 below.

2.3.3. Published Landscape Character Areas for the site are shown on Figure 3 (Appendix 1).

2.3.4. In addition, Savills has undertaken a more detailed landscape character assessment for the site. These draft landscape character areas are shown on Figure 4 (Appendix 1).

NCA 115 Thames Valley

2.3.5. The site is situated at the south-western edge of National Character Area 115 'Thames Valley' (Natural England, 2015). This is described as a low-lying area where the River Thames provides a unifying feature through a very diverse landscape of urban and suburban settlements, infrastructure networks, fragmented agricultural land, historic parks, commons, woodland, reservoirs and extensive minerals workings. The area is typified by much development, both in the past and planned for the next 20 years, and with 'virtually no undisturbed land'.

2.3.6. Key characteristics of the Thames Valley described in the assessment that are relevant to the site are:

- *"Flat and low-lying land*
- *The underlying geology is dominated by the London Clay which, over much of the area, is overlain by river-lain sands and gravels.*
- *The numerous hydrological features provide unity to an area which otherwise lacks homogeny; these features include the River Thames and its tributaries…*
- *The field pattern is medium-scale and irregular, with smaller fields to the west…*
- *The area has an urban character, and there are very few villages of more traditional character…"*

2.3.7. Statements of Environmental Opportunity (SEO) for the character area that are relevant to the proposals relate to opportunities to enhance biodiversity and links to urban areas:

- *"SEO 3: Maintain existing greenspace and plan for the creation of green infrastructure associated with the significant projected growth of urban areas, to reduce the impact of development, to help reduce flooding issues, and to strengthen access and recreation opportunities. Seek links from urban areas to wider recreation assets such as the Thames Path National Trail, National Cycle Routes, and the river and canal network, and promote the incorporation of best practice environmental measures into any new development.*
- *SEO 4: Protect and manage the area's historic parklands, wood pastures, ancient woodland, commons, orchards and distinctive ancient pollards, and restore and increase woodland".*

2.3.8. The landscape enhancements associated with LGV can be used to create more accessible Green Infrastructure and protect and reinforce these landscape features (complying with SEO3). Whilst areas of farmland (especially arable) will be replaced by development, there will be significant opportunities for extensive of semi-improved grassland to be replaced with more diverse habitats and landscapes such as species-rich meadows, native woodland, mire and orchards (complying with SEO4).

Wokingham Borough Landscape Character Assessment (2019)

2.3.9. The most recent local level Landscape Character Assessment was prepared in 2019. This was published as part of the evidence base for the Draft Local Plan consultation in 2020. The document supersedes the previous Landscape Character Assessment for the Borough (LUC on behalf of WBC, 2004).

2.3.10. Given the size of the Site, its landscape character varies. It is especially influenced by the River Loddon and its associated terraces, that run in an approximate north-south direction through the Site. The landscape is subdivided into four main areas in the Wokingham Landscape Assessment, namely:

- A2 Loddon River Valley
- C1 Arborfield River Terrace
- J2 Arborfield and Barkham Settled and Farmed Clay
- J3 Spencers Wood Settled and Farmed Clay

2.3.11. The majority of the proposed built environment of the LGV is situated within area C1 'Arborfield River Terrace'. The proposed Country Park area is situated primarily in Character Area A2 'Loddon River Valley' while the Thames Valley Science Park is primarily located within Area J3 'Spencers Wood Settled and Farmed Clay'. Relevant key characteristics for these areas are set out in Table 2.1 below.

2.3.12. A review of these characteristics shows that the TVSP area is not reflected in the character of the Spencers Wood Settled and Farmed Clay (J3) and Arborfield River Terrace (C1) areas. Here, the new large studios and University Gateway Building with associated road and parking infrastructure have resulted in a clear change to the land uses, meaning that it is no longer agricultural. We recommend that when the Wokingham Landscape Assessment is updated, this change needs to be recognised as either a new 'key characteristic' for these character areas, removed from the character assessment altogether or form part of a new landscape character area.

2.3.13. Other key characteristics for Areas A2, C1 and J2 (see Table 2.1) are typical of the site and provide a useful basis for appraisal and planning work. It would be beneficial if the boundaries of these character areas could more specifically relate to features on the ground, such as field boundaries, built infrastructure, roads and water features for example. Currently the boundaries appear to have been designed at a relatively strategic level, and a greater degree of accuracy would be helpful.

Table 2.1: Baseline Key Characteristics (Wokingham Borough Landscape Character Assessment, 2019)

Landscape Character Area
A2 Loddon River Valley
Key Characteristics ▪ Broad, flat alluvial floodplain ▪ River Loddon, following a meandering course with streams and tributary rivers ▪ Wooded backdrops with semi-natural woodland with ancient woodland (all designated as LWSs) ▪ Pasture and arable farmland in medium and large irregular geometric fields; pasture and wet meadow closest to the river ▪ Wetland character, including BAP priority habitats of floodplain grazing marsh, wet woodland, lowland fen and lowland meadows ▪ Important historic riverside features include traditional brick humpback bridges and water mills ▪ Tranquil and rural character away from river crossings and visual influence of large-scale settlement in adjacent areas; the south of the area is also a resource of 'dark skies' ▪ Little public access to the floodplain; busy roads cross the flood plain, including the A33, M4 and Winnersh and Shinfield Eastern Relief Roads, and create physical and visual severance along the floodplain ▪ Pylons, residential and commercial development are distinctive visual features in this open and flat landscape **Valuable Landscape Attributes** ▪ The naturalness of the meandering course of the River Loddon and wide floodplain landscape which provide a strong sense of place ▪ The wooded backdrop of mature broadleaved woodland copses and natural riparian corridors, including ancient woodland which provides scenic quality and a sense of place, as well as framing views across, into and out of the area ▪ Important wetland features/ habitats including BAP priority habitats wet woodland and floodplain grazing marsh remnants designated as LWSs, and the nationally important Stanford End Mill and River Loddon SSSI that are uncommon in the borough and provide important ecological habitats ▪ Historic riverside features including medieval moated sites, old brick watermills and bridges... the GHQ Stop Line and associated Second World War features which follow the course of the rivers ▪ Sparse settlement pattern of farmsteads … characterised by a strong local vernacular which contributes to the scenic quality of the area and imparts a sense of time depth ▪ Remote and rural landscape in the south of the area due to the limited access to the floodplain and absence of development on the valley floor ▪ Localised areas with a strong sense of tranquillity particularly in the south, with naturalistic qualities and experience of dark skies away from roads and visual influence of large-scale settlement in adjacent areas.

C1 Arborfield River Terrace

Key Characteristics

- Gently undulating river terrace landform between 45-50m AOD to the east of the River
- Loddon floodplain; the area is underlain by London Clay and river terrace gravels which give rise to loamy soils which are better drained than the floodplain, and therefore intensively farmed
- Small water features including tributary stream running through the Holt and drainage channels and ponds
- Intensive arable farmland with medium to large fields bound by indistinct boundaries, mainly post and wire fencing, with occasional gappy remnant hedgerows; some horse paddocks and cattle grazing at the University of Reading Farm and Centre for Dairy Research
- Small woodland and copses break up the agricultural plain; BAP priority habitat mixed lowland deciduous woodland dominates, with some wet woodland designated as LWS (Cuckoo Pen, Gravel Pit Wood/ The Holt, Loaders Copse, Winnersh Woodland); Pound Copse and Great Wood LWS also contain small areas of ancient and semi-natural woodland
- Remnant historic parkland associated with the former Arborfield Hall; the presence of mature oaks provides a strong silhouette against the open sky
- Low-density settlement of farmsteads (typically red brick with weather boarded barns), manor houses and hamlets, except for the area north of the M4 where development has extended onto the river terrace on the edge of Winnersh
- Large, modern agricultural buildings are prominent features of the landscape
- Tree-lined narrow lanes, tracks, byways and footpaths allow recreational access to the river terrace, and access to the Loddon floodplain
- Clear long-distance views across the adjacent floodplain due to the unvaried topography
- The spire of Arborfield Church provides a landmark feature in distant views
- Rural character and sense of remoteness, due to the predominance of narrow lanes and tracks and very low density settlement; this is interrupted by the transport corridors in the north of the area, the M4, and new Winnersh Relief Road, as well as the proposed Arborfield Cross Relief Road in the centre of the area

Valuable Landscape Attributes

- Surface water, including ponds, historic moats and drainage ditches, adds visual interest and provides potential for small-scale wetland habitats
- Small deciduous woodlands, some of ancient origin and containing BAP priority habitat punctuate the agricultural landscape providing visual diversity within the open arable fields, and form a backdrop to views, as well as providing important ecological habitats
- Dispersed settlement pattern linked by tree-lined rural lanes, emphasises the open and rural character of the landscape
- Valued area for recreation with a network of bridleways and public footpaths which allow enjoyment of the landscape
- Historic parkland landscapes at Swallowfield and Arborfield provide time-depth; mature oaks create visual interest and strong silhouettes against the open sky
- Clear views to adjacent character areas due to the gently undulating, open landscape
- A tranquil area with a sense of remoteness, removed from roads and visual intrusion of settlement

J2 Arborfield and Barkham Settled and Farmed Clay

Key Characteristics

- A gently undulating landscape between 50m and 65m AOD, underlain by London Clay with localised areas of River Terrace Gravels; shallow wooded valleys follow the course of the Barkham Brook, which is geologically marked by areas of alluvium
- Consistent pattern of water bodies including streams, drainage channels, ditches and open water bodies of various sizes resulting from the clayey and loamy soils which impede drainage
- Wooded context provided by characteristic mature hedgerow and in-field trees, combined with woodland belts, with BAP priority habitats and ancient woodland, and the wooded horizons of the surrounding hills; this creates a loose sense of enclosure
- Arable farming dominates, with pasture on higher ground and horse paddocks near settlement; fields are large and geometric, bound by fragmented hedgerows supported by post and wire; fields used for paddocks are often subdivided with horse tape
- Small-scale wet woodland and wetland habitats scattered on the edge of the area, often designated as LWS; BAP priority habitat wet woodland and wet meadow and wet grassland
- A dense settled character influenced by modern development including the new garden village on the site of Arborfield Garrison and the southern edge of Wokingham which incorporates an industrial estate; there is little consistent style or form
- Older scattered settlement of farms, hamlets and small nucleated villages at Barkham and Arborfield Cross; the buildings have a traditional vernacular of timber framing and clay tiles, exemplified by the Conservation Area at Arborfield Cross; a number of farmhouses are listed
- A network of busy local roads crosses the area; they tend to be rural in character, with ditches, hedges and hedgerow trees, sometimes opening directly onto the arable fields
- Public rights of way run between the settlements, and provide access for recreational use
- A rural character away from development and roads, with views across to adjacent character areas including across the Loddon Valley
- A historic road, now represented by footpaths, lanes and Victorian carriageways, that appears on Norden's map of 1607, connecting Swallowfield Park via Arborfield Cross and the Coombes (in LCA L1), with Wokingham

Valuable Landscape Attributes

- Barkham Brook and associated wetland which provide important ecological habitats including wet meadow and BAP priority habitat wet woodland
- Pattern of arable and pastoral fields, which provides a rural character away from settlement and creates an important separation between settlements
- Mature hedgerow trees and in-field trees which provide a wooded character and visual interest within the landscape
- Historic Second World War pillboxes and other defence works, which are now a scenic part of the landscape
- Rural settlement pattern of farms, hamlets and small nucleated villages outside the urban area which provides a rural character and a link to the past
- Recreational value of the network of rights of way between settlements
- Views across the landscape to surrounding character areas, particularly across the river valleys to the west and to the wooded hills to the north and south provides a loose sense of enclosure

J3 Spencers Wood Settled and Farmed Clay

Key Characteristics

- Rolling clay ridge above the Loddon Valley to the east and the lowlands to the west, rising to a flat sandy plateau at 66m AOD
- Small scattered mixed deciduous woodland blocks and copses including some of ancient origin, many designated as LWS, most located on the steep west and south facing slopes of the ridge.
- Fragmented unimproved meadow habitats, with BAP priority habitat lowland meadow, are found on lower slopes, for example Clare's Green Road LWS
- Large arable fields with some pasture, with an intact hedgerow network and hedgerow oaks; horse paddocks feature on the edge of settlements or around large farmsteads; smaller and irregular field boundaries are still evident, indicating early enclosure
- Remnant parkland at Shinfield Grange, Loddon Court, Shinfield Lodge etc; a number of these are clustered along the top of the ridge overlooking the clay lowlands of Grazeley to the west; these parklands contain BAP priority habitat lowland wood pasture and parkland and ancient woodland; visually prominent parkland veteran trees include many Wellingtonias, there is a prominent avenue of these trees along the drive to Wellington Court, originally the Stanbury Park estate
- The GHQ Stop Line and associated Second World War features built during the summer of 1940 to contain the threatened German invasion
- Densely settled landscape, with new large-scale residential estate development around the substantially 20th century settlements of Shinfield, Spencers Wood and Three Mile Cross, as part of South of the M4 SDL
- To the south of the area, settlement is more scattered with traditional farmsteads many with a strong vernacular of polychromatic Reading brick and weatherboarding; a number of farmhouses are listed including Grade II* Sheepridge Court; there is a permanent mobile home site at Loddon Court Farm and some agricultural buildings have been converted to other uses e.g. Lambs Farm Business Park
- Network of rural lanes bordered by water-filled ditches connect the original settlement pattern; some B roads have urbanised features including kerbs and pavements; the A33 forms the western border and is very busy, while the M4 crosses the area north of Shinfield, and introduces noise and movement
- Sense of elevation from the ridgeline and good views over surrounding lowlands including to the Loddon valley and over West Berkshire

Valuable Landscape Attributes

- Remnant historic parklands and visually prominent parkland trees, including many Wellingtonias, especially the avenue of this species which provides time-depth, visual diversity and a sense of orientation to the landscape
- Pattern of arable and pastoral fields, which provide a rural character away from the urban areas and provide an important separation between settlements
- Small-scale woodlands provide visual diversity in the landscape, as well as ecologically important habitats
- Strong hedgerow network with standard oaks provides a wooded character and visual interest within the rural landscape
- Network of rural lanes bordered by water-filled ditches provide evidence of the original settlement pattern
- Views to the surrounding lowlands provide a sense of place and of orientation
- Undeveloped slopes of the clay ridgeline which is visually prominent and provides separation between settlements
- The GHQ Stop Line and associated Second World War features which follow the course of the Foundry Brook crossing the southern end of the clay ridge and along the River Loddon
- Isolated traditional farmsteads and their associated buildings, particularly in the south of the LCA

Savills Landscape Character Assessment

2.3.14. Savills has compiled a more refined landscape character assessment for the site (see Figure 4, Appendix 1). The character areas here have some similarities with those of the Wokingham Landscape Assessment, however they take on board varying land use changes and utilise recognisable boundary features.

2.3.15. Savills Character Area CA1 'Thames Valley Science Park' acknowledges the employment related characteristics of this area which were not reflected in the Spencers Wood Settled and Farmed Clay area and Loddon River Valley areas of the Wokingham Landscape Assessment. It includes areas with new and consented development as well as adjacent areas which have views of recently constructed buildings.

2.3.16. To the south of CA1 Savills Character Area CA2 occupies a similar area to that of the Wokingham Landscape Assessment Area A2, but excluding the TVSP land.

2.3.17. Savills has subdivided the main area proposed for occupation by the LGV, (and covered by Area C1 Arborfield River Terrace within the Wokingham Landscape Character Assessment) into three smaller landscape character areas. This recognises that this linear character area has some distinct sub-areas. These include the remnant heritage characteristics of the landscape, listed buildings and scheduled monument at the southern part of the site (Area CA3 'Arborfield Hall River Terrace'), the arable farmland character around the Centre for Dairy Research ('CEDAR') (Area CA4 'Loddon East River Terrace') and equestrian characteristics and M4 corridor character of the northern part of the site (Area CA6 'Hatch Farm River Terrace').

2.3.18. Savills has placed the land along the Mole Road corridor and Carters Hill within CA5 'Mole Road and Sindlesham'. This partly reflects the characteristics of the Wokingham Character Assessment Area J2 Arborfield and Barkham Settled and Farmed Clay but has boundaries that follow field recognisable features on the ground. In particular it recognises the visual connectivity across some of the fields here and removes potential confusion where the Wokingham Landscape Assessment places single fields into two different character areas.

2.3.19. In summary, the Wokingham Landscape Assessment provides a helpful summary of the varying landscape character of the River Loddon landscape, which can help describe and guide future development in this area. In part however the generalised nature of the assessment and recent changes within the TVSP area in particular mean that it would benefit from updates in places. Currently for example, the Assessment incorrectly describes the TVSP area as having a rural landscape and also inaccurately demarcates the boundaries between the various character areas.

2.4. Baseline Landscape Features

2.4.1. As demonstrated in the landscape character assessments, the site is primarily covered by extensive areas of arable and pasture farmland, interspersed with mature hedgerows and trees and occasional buildings.

The latter include veteran trees, ancient woodland and non-ancient woodland (see Figures 2 and 3, Appendix 1).

2.4.2. At its southern end, the site has an area of remnant parkland adjacent to the site of the previous Arborfield Hall, however areas of arable cultivation and the relatively low quality of trees in this area have eroded its value and character.

2.4.3. At the northern end of the site at Hatch Farm, there is an area of equestrian grazing and stables. Land here also has a closer visual relationship with the M4 motorway.

2.4.4. The centre of the site is more strongly influenced by the River Loddon and its floodplain topography (see Figure 5, Appendix 1). This also includes the Barkham Brook to the south, and numerous other streams and ditches along the flood plain to the north. To the south-east and north-west, the terrain of the wider area rises towards more elevated areas at Arborfield Cross and Lower Early/Reading respectively.

2.4.5. The site benefits from a number of Public Rights of Way (PRoWs) (see Figures 4 and 5, Appendix 1). These include a number along and close to Cutbush Lane to the north and a route along the southern river terrace between Sindlesham and Arborfield via Carters Hill. A few further routes connect to this corridor from Mole Road. Only one route crosses the River Loddon, linking Cutbush Lane with Hall Farm and beyond to Arborfield. A large part of the site to the north of the River Loddon is currently inaccessible to the general public.

2.5. Visual Baseline

2.5.1. As part of our preliminary work we have walked all footpaths within the site as well as privately accessible fields and woodlands. We have also driven and walked public highways and footpaths around the site boundary, including Lower Earley Way, Shinfield Eastern Relief Road and the area around Arborfield and Arborfield Cross including the Arborfield Relief Road. These surveys have been undertaken during the winter months when vegetation was sparse, as recommended by GLVIA3

2.5.2. A sample of views are shown in Figures 8 to 22 in Appendix 1, however a more comprehensive visual appraisal will be provided to accompany any planning application going forward.

2.5.3. Our surveys show that the site is generally very well concealed from the wider area due to the presence of vegetation and undulating terrain. Key public views into the site are from the short stretches of the surrounding roads, namely the M4 (Appendix 1, View 1), Lower Earley Way (View 2), Mill Lane (View 3 and 5), Hatch Farm Way (View 4), Park Corner Lane (View 8) Mole Road (Views 10 and 11) and Reading Road.

2.5.4. There are also views from a relatively limited number of public rights of way that run through the site (see Appendix 1 Views 12 – 22).

2.5.5. There are also glimpsed private views from a small number of existing houses in Arborfield along Mole Road, Mill Road, Hatch Farm Way, Carter's Hill and from the eastern side of Shinfield as well as a small number of homes within the development area at Hall Farm.

2.6. Consultation and Engagement

2.6.1. Savills landscape architects have met with Wokingham Borough Council officers in December 2023 as part of a workshop to discuss the Green Infrastructure design for the LGV. This included discussion with the Council's Landscape and Planning Officers and high-level feedback on where views should be assessed.

2.7. Potential Landscape Effects of the Emerging Loddon Garden Village Masterplan

2.7.1. The proposed LGV has been subject to design work by a multi-disciplinary team led by Savills Urban Design Studio. A further design has been prepared by David Lock Associates on behalf of Wokingham Borough Council. The David Lock Concept Plan for Loddon Garden Village is provided at Figure 8 of the LPU Policy SS13 (the 'Figure 8 Concept Plan'). Supporting paragraph 5.108 of the LPU states that the council recognises that the areas shown on the Figure 8 Concept Plan are indicative and that the masterplanning will establish where building will occur in more detail. The Figure 8 Concept Plan shows a layout that is similar to the emerging Savills Urban Design Studio masterplan presented in the Vision Document, in terms of the focus for the new development and the location of new access points for example.

2.7.2. Based on our site appraisals and a review of the Figure 8 Concept Plan, we make the following conclusions with regards to potential effects on landscape character and features:

- The proposed development should not generally result in significant adverse effects on landscape features along and to the north of the River Loddon. Key existing elements such as hedgerows, veteran trees, drainage channels and PRoWs can be retained as part of the layout and further landscape enhancements can take place in association with the proposed Country Park.

- New road infrastructure will be introduced across the valley floor to the south of the M4 motorway. This will include a road bridge over the motorway which will connect to Lower Earley Way to the north. This stretch of road and bridge infrastructure will be accompanied by planting and ecological mitigation to help screen the structures, however this will inevitably lead to a degree of fragmentation of the fields in this area. The significance of the effects will be reduced however, given that the strength of the landscape character here is already compromised by the presence of the M4 motorway, electricity pylons and cables as well as a proposed pumping station enclosure.

- To the south of the River Loddon, the change from arable fields, pasture, farm research buildings and pony paddocks to an area of new homes, streets and community infrastructure will inevitably result in a change to the landscape character. The Concept Plan shows that this can be designed to retain important landscape features such as hedgerows, ancient woodland and veteran trees however and use these to form the structure of the overall layout. This retained landscape structure will also include the avenue and remnant parkland trees within the old Arborfield Hall area and vegetation along the River Loddon.

- Existing Public Rights of Way will also be retained and incorporated within the layout. These will be supplemented by additional pedestrian and cycle routes throughout the proposed housing area as well as into the new Country Park to the north. These will also connect to Lower Earley and the new SANG

extension to the south. The proposed development will therefore be associated with a far greater accessibility to and through the landscape.

- In addition, views to local landmarks such as St. Bartholomew's Church can be retained within the masterplan and the historic cluster of buildings at Hall Farm also retained within a distinct leafy character area set back from newer contemporary properties.

- Whilst there will be a loss of farmland, the baseline character of this land and its historic landscape characteristics has already been eroded over recent years. This has included the replacement of pasture and parkland with arable fields and pony paddocks as well as the construction of modern dairy and equestrian buildings. At the north-eastern end of the site there are some views to the M4 motorway and also an associated reduction in tranquillity which has also further reduced the rural character.

- To mitigate these changes to landscape character, the proposed development will be set within a new structure of generous open spaces incorporating new tree and shrub planting, meadows and amenity grassland, orchards, community gardens and green-blue corridors. The latter will include rain gardens and attenuation basins including some permanently wet ponds and seasonally flooded areas, with their accompanying diversity of habitats. The settings of the existing River Loddon and Barkham Brook can also be retained as undeveloped green corridors.

- The settings of listed buildings and the homes within the hamlet of Carter's Hill and along Mole Road will be respected, with undeveloped space retained around these areas. This can include a neighbourhood park, community food growing and areas retained as pasture and arable fields. This includes the triangular field to the south of Parkcorner Lane which is shown as a 'Protected Higher Ground Area' in the Concept Plan in the LPU Figure 8 Concept Plan. This terminology is not defined elsewhere within any LPU policies or supporting text and it is recommended that this hatch/definition is removed and replaced with an open field.

- In addition, the effects of the new built infrastructure on the rural landscape will be mitigated by compensatory landscape enhancements within the new Country Park area. This will be focussed to the north of the River Loddon, making it accessible to users of the Thames Valley Science Park as well as the new homes within the LGV. This could include:

    - The restoration of the historic riverside landscape, with new species rich meadows and wet woodlands for example, Biodiversity Net Gain (BNG) and wildlife habitat enhancements.
    - Increased accessibility and opportunities for wildlife/landscape interpretation through the retention of the landscape within a new Suitable Alternative Natural Green Space (SANG)
    - Long term commitment to the landscape management and maintenance through the SANG and Country Park designations
    - Associated recreational, education and research benefits, including play facilities, interpretation, trails, bird hides, a Forest School area, parking and a café/visitor centre

2.7.3. In summary, whilst it is inevitable that a new village will result in the loss of an associated area of farmland, it is important to recognise that the value of some of this existing landscape character has already been compromised. The new village will be associated with a commitment to deliver an extensive area of green spaces and landscape enhancements, including a Country Park and SANG. These can help restore the river valley landscape character of the site, with new meadows, tree and woodland planting and ponds for example, as well as providing social opportunities such as play, food growing and exercise.

2.8. Potential Visual Effects of the Emerging Loddon Garden Village Masterplan

2.8.1. Our preliminary review of the visual context and potential effects of the site, based on the Local Plan Update LGV Concept Plan shows that the site is well-screened from the wider area. Key changes will be from roads immediately adjacent to the site. This will include views of the new spine road and bridge over the M4 when seen from the Lower Early Way corridor and M4 and views of the new access points on to Reading Road, Mill Lane, Mole Road and Hatch Farm Way from these respective highways. Whilst this will bring a more urban character to some of these views, given that they are already dominated by foreground highway infrastructure and receptors will be classed as 'low' sensitivity, the overall effects may not be significantly adverse.

2.8.2. The other main changes to views will be from the existing public rights of way that run through the site. The routes running to the south of the River Loddon, connecting with Arborfield and adjacent to the Dairy Research Farm for example will experience changes with the introduction of new homes, open spaces and infrastructure, however this would be partially mitigated through the retention of existing hedgerows and trees and introduction of new vegetation for example. To the north of the River Loddon, the existing footpath corridor will experience changes, as views will incorporate enhancements associated with the new SANG and Country Park. These changes to views need not be negative however, depending on the nature of the detailed landscape and architectural design.

2.8.3. Finally, there may be some changes to the views of a small number of private homes, as set out in paragraph 2.35 above. In planning terms there is no 'right to a view' from a private house, however the Figure 8 Concept Plan shows that proposed development can be laid out to retain undeveloped, open areas around existing properties at Carter's Hill, Arborfield, Sindlesham and Mole Road. Where land ownership permits, these areas can incorporate additional tree planting to soften views of new development and help conserve the setting of existing buildings.

2.8.4. In summary, the visual effects of the proposed development will extend to a very limited area. The design of the masterplan can help conserve the rural setting of the limited number of existing homes and footpaths that would have views, although it is inevitable that there will be some changes to the visual context of these visual receptors within the site boundary. With sensitive landscape mitigation and high quality architectural design, any visual changes may be beneficial or neutral however, rather than adverse.

3. Delivery of Loddon Valley Garden Village: Review of Emerging Landscape Policy

3.1. Compliance with Emerging Policies and Designations

3.1.1. The site is not covered by any adopted landscape amenity designations.

3.1.2. The Bearwood College Registered Park and Garden ('RPG') lies close to the north-eastern boundary of the site. This designated area includes the Reading FC training complex, which has eroded its rural character in this area. The rest of the RPB is generally screened from the site due to a high proportion of mature trees and vegetation, both along Mole Road and within the wider designated area.

3.1.3. The LGV Concept Plan ensures that no new buildings are located close to this designation, and instead ensures that an open area of fields is retained. This could include additional tree planting if required, to strengthen the visual separation between the proposed LGV and the RPG.

Emerging Policy SS13: Loddon Valley Garden Village

3.1.4. Policy SS13 provides a series of requirements relating to the design and delivery of the LGV and Country Park. These are accompanied by an indicative Concept Plan at Figure 8.

3.1.5. With regards to landscape and green infrastructure requirements, the policy reflects the emerging design for the site as tested by Savills on behalf of the landowners, namely the provision of:

"f) A multi-functional country park which is accessible to settlements beyond the garden village; and

g) A solution to avoid or mitigate the impact of development upon the Thames Basin Heaths Special Protection Area through the provision of sufficient Suitable Alternative Natural Greenspace (SANG) (subject to monitoring of the quality and quantity standards)."

3.1.6. Policy SS13 (3) provides requirements for the siting, layout, and form of development, including landscaping. Of particular relevance to landscape are requirements to:

"a) Draw on and enhance the site's context, changes in topography and its considerable natural assets such as the River Loddon and Barkham Brook, irreplaceable habitats, and hedgerows, trees, woodland and other features;
b) Protect and retain the permanent physical and visual sense of separation of Arborfield and the defined settlements of Arborfield Cross and Shinfield;
c) … Where important local facilities are necessarily located beyond the neighbourhood, these should be linked by accessible and attractive routes which support and encourage active travel. The promotion of community facilities for shared use, such as outdoor and indoor sports and leisure provision will be strongly encouraged;
d) Establish a comprehensive and integrated network of high-quality and attractive active travel routes, greenways and bus services within the garden village and to destinations in the wider area;

e) Incorporate measures to protect the separate identity of Carter's Hill;
f) Incorporate measures to conservation and enhancement of heritage assets, including listed buildings, through appropriate design and the provision of sufficient space;
…
h) Locate higher development densities around the district and local centres, transport nodes, and along public transport routes subject to site specific sensitivities such as landscape, character and heritage;
j) Draw on the recreational and ecological opportunities of the River Loddon and Barkham Brook to create a multi-functional country park which provides coherent ecological networks, recreational opportunities and active travel connectivity."

3.1.7. We consider that these are appropriate aspirations for the design of the LGV in landscape and visual terms, and the Concept Plan begins to show how these can be achieved.

3.1.8. Within Policy SS13: 5(a), there is a requirement for a landscape-led approach to masterplanning which we also agree is appropriate to the site.

3.1.9. Within emerging Policy SS13: 6 there is a series of requirements for landscape and green and blue infrastructure. This requires:

"… a comprehensive strategic landscape and green and blue infrastructure strategy that:

a) Provides a new country park incorporating the River Loddon and Barkham Brook that contributes to, and enhances, coherent ecological networks and habitats, which are integrated into the wider green and blue infrastructure beyond the garden village;
b) Protects and enhances the identified attributes of the River Loddon Valued Landscape and Barkham and Bearwood Valued Landscape;
c) Provide a network of connected, accessible and high-quality open spaces that includes tree lined streets, opportunities for local food growing and natural play, that integrate with the wider green and blue infrastructure network;
d) Retains, and incorporates appropriate buffers for, ancient woodland, ancient or veteran trees, watercourses, hedgerows, and other trees into the connected green and blue infrastructure of the site;
e) Provides a network of safe, attractive, landscaped and accessible public rights of way across the site, and where appropriate demonstrates how they connect into the existing rights of way network;
f) Contributes to establishing the Loddon long distance footpath for active travel; and
g) Establishes clear and robust arrangements for future maintenance.

3.1.10. In general we consider that these requirements are appropriate and deliverable. There is however, an inconsistency with the policy wording relating to the River Loddon Valued Landscape and Barkham and Bearwood Valued Landscape (SS13: 6(b) and that set out in Policy NE6. We review the Valued Landscape policy below (paragraphs 3.15 to 3.28).

Proposed Changes:

Policy SS13 .6 (b) relating to Valued Landscape values should be updated to ensure consistency with the wording of Policy NE6

Figure 8 Concept Plan. Whilst we understand that this is an indicative plan we propose that the ''Protected Higher Ground Area' hatch is removed from the plan and key. This terminology is not used or defined elsewhere in the LPU policies or text (see paragraph 2.38 above)

Policy NE5: Landscape and Design

3.1.11. Policy NE5 part 1 requires development to take a landscape led approach which protects and enhances the character and distinctiveness using the most up-to-date landscape studies (including the Landscape Character Assessment and Design Guide. Whilst we agree that a landscape led approach should be taken, it may not always be possible to protect and enhance the character of the landscape, as there may inevitably be a degree of change resulting from the introduction of built development. We therefore proposed that Policy NE5 part 1 is amended as follows:

Proposed Changes:
Policy NE5, part 1. Development proposals will be supported where they adopt a landscape led approach which seeks to protect~~s~~ and enhance~~s~~ the character and distinctiveness of landscapes using the most up-to-date landscape studies (including the Landscape Character Assessment and Design Guide and any successor document).

3.1.12. Policy NE5 part 2 requires development to be demonstrably informed by and respond to the distinctive characters set out in the landscape Character Assessment and other relevant assessments, providing an understanding of the valued characteristics, features and quality of local landscape character areas. We consider this to be an appropriate approach, albeit recognising that the existing landscape character assessment should be updated going forward.

3.1.13. Policy NE5 part 3 requires development proposals to be accompanied by a landscape and visual impact assessment, proportionate to the scale and nature of the development. We consider this to be an appropriate approach.

3.1.14. Policy NE5 part 4 requires landscape schemes to be set within an overall masterplan for the proposed development and incorporate appropriate landscape structure, spaces, public realm, green and blue infrastructure, landscape transitions and a long term landscape establishment and management plan. We consider this to be an appropriate approach in general, however the policy should acknowledge that landscape spaces, public realm and green and blue infrastructure may not be deliverable for very small developments.

Proposed Changes:

Policy NE5, part 4 (b). Incorporates a landscape structure that ~~spaces, public realm and green and blue infrastructure to~~ achieves a sense of place, improves health and wellbeing and mitigates and adapts to the impacts of climate change;

Emerging Policy NE6: Valued Landscapes

3.1.15. The LPU has introduced a new designation, Valued Landscapes within the borough, covered by Policy NE6. These are designated 'in recognition of their distinctive character to the Borough's landscapes' (draft Policy NE6, 1). Supporting paragraph 14.57 states that "All landscapes are important, but some will have particular value and exhibit specific attributes and characteristics that lift them above the rest." This implies that Valued Landscapes have this elevated value, attributes and characteristics, though this is not expressly stated.

3.1.16. There is one Valued Landscape Areas within the proposed LGV, the 'River Loddon' (see Appendix 1, Figure 1). This covers much of the proposed country park area as well as some of the proposed housing area to the south of the River Loddon. Beyond the site, to the east of Mole Road there is also the 'Barkham and Bearwood' Valued Landscape.

3.1.17. Draft Policy NE6 states:

"…
2. Development proposals located within or affecting a valued landscape should have particular regard to the following attributes:

a) Landscape quality (condition);
b) Scenic quality;
c) Rarity;
d) Representativeness;
e) Conservation interests;
f) Recreation value;
g) Perceptual aspects; and
h) Associations.

3. Development proposals affecting Valued Landscapes will only be supported where they protect, and where appropriate, integrate with and / or enhance the special features, characteristics and qualities of the landscape, unless the benefits of the development in that location clearly outweigh the harm"

3.1.18. Part 2 of Policy NE6 is informed by the Landscape Institute and IEMA's Guidelines for Landscape and Visual Impact Assessment (GLVIA3, Box 5.1, page 84). The GLVIA3 therefore provides a little more clarity on the meanings of these attributes, however in reality this is a relatively complex range of characteristics that are difficult to measure in either qualitative or quantitative terms.

3.1.19. The boundaries of the Valued Landscapes have been guided by the Borough Landscape Character Assessment and a further WBC topic paper, "Valued Landscapes Assessment" (September 2024). An earlier Topic Paper (Valued Landscapes Topic Paper, January 2020) also set out draft boundaries and associated 'buffer' areas that required further testing.

3.1.20. The boundaries of the 'River Loddon' Valued Landscape has changed and made larger since the 2020 Topic Paper. This has resulted in the Valued Landscape boundary overlapping with some of the proposed

built infrastructure elements identified by the LPU Figure 8 Concept Plan. This means that the draft River Loddon Valued Landscape boundaries now include:

- Proposed development parcels and spine road to the north of Reading Road/north-west of Arborfield.
- Proposed development parcels to the immediate south of the River Loddon and north of the existing CEDAR.
- Proposed development parcels and spine road to the north of Carter's Hill and along Betty Grove Lane.

3.1.21. As with the 2020 draft, the Valued Landscape still also covers the alignment of the access road that would connect with Lower Earley Way, including the proposed bridge over the M4 motorway and the proposed road crossing the valley to the south of the M4 connecting with the northern part of the LGV.

3.1.22. Beyond the LGV, the emerging 'River Loddon' Valued Landscape boundary now also covers a potential future Employment area to the south of the TVSP at the western end of Cutbush Lane as well as additional parcels of land to the north of Lower Earley Way.

3.1.23. Given that parts of the 'River Loddon' Valued Landscape have already been compromised by the adjacent road corridors, such as the Lower Earley Way, M4 and London Road, and also have little visual connectivity with the River Loddon, they do not actually have distinctive characteristics "*that lift them above the rest*." (LPU supporting paragraph 14.57). We therefore recommend that some of these areas are removed from the designation.

3.1.24. Paragraph 6.64 of the Council's Valued Landscape Assessment (2024) describes the Council's approach to the boundary review (underlining our emphasis):

"Following review of the responses to the consultation, the boundaries of the proposed valued landscape areas have all been reassessed. It should be noted that landscape is a continuum, and boundaries will often represent zones of transition, but to make the valued landscape designation clearer and to simplify its use, t<u>he boundaries have been refined so that, wherever possible, they follow identifiable features on the ground such as field boundaries or roads. A consequence of this is that the valued landscapes may, therefore, include some areas that may not 'exhibit any of the demonstrable physical features' but nonetheless form an integral part of the wider valued landscape."</u>

3.1.25. The changes to the emerging 'River Loddon' Valued Landscape boundary are in some places significantly different to the 2020 version (see Appendix 2 for the 2020 boundaries). These changes go beyond the original 'buffer' areas and generally are not just a result of the area being amended to follow 'identifiable features on the ground'.

3.1.26. To avoid confusion and allow consistency with the LGV concept plan, the 'River Loddon' Valued Landscape boundaries require further refinement. In particular, it would be preferable for the land proposed for development to be re-considered in relation to whether the attributes of the land complies with the definitions set out in NE6 (1), where this conflicts with the proposed development shown on the Figure 8 Concept Plan, as described in paragraphs 3.20 and 3.22.

3.1.27. There is further inconsistency between the wording of the supporting text to Policy NE6 and the wording supporting paragraph 14.60 that creates uncertainty about the circumstances under which development will be allowed within an area designated as a Valued Landscape. Paragraph 14.60 states that "*Where development is deemed appropriate, it should appropriately respond to the landscape through location, layout and high quality design."* Part 3 of Policy NE6 is however more prohibitive of development proposals affecting Valued Landscapes, unless the benefits of the development in that location clearly outweigh the harm.

3.1.28. This creates an inconsistency between the wording of Part 3 of Policy NE6 and its supporting text that must be addressed. Text should be incorporated to the wording of Policy NE6 text relating to development that is deemed appropriate.

Proposed Changes:

Valued Landscape Boundary: *Redraw boundaries of the 'River Loddon' Valued Landscape to make consistent and compatible with the LGV Figure 8 Concept Plan and remove areas of landscape that do not have particular value, attributes and characteristics "that lift them above the rest" (LPU supporting paragraph 14.57) such as those along road corridors.*

Policy NE6, part 3. *Development proposals affecting Valued Landscapes should ~~protect, and where appropriate,~~ integrate with and / or enhance the special features, characteristics and qualities of the landscape. Where development is deemed appropriate, it should appropriately respond to the landscape through location, layout and high quality design. ~~unless the benefits of the development in that location clearly outweigh the harm~~*

4. Review of Local Plan Update Evidence Base

4.1. Introduction

4.1.1. Section 4 reviews a number of background documents that WBC have used within their LPU evidence base. These all have relevance to either landscape and visual amenity or open space provision.

4.2. Wokingham Landscape Character Assessment (2019)

4.2.1. The character area boundaries of the Wokingham Borough Landscape Character Areas are shown in Appendix 2, Figure 2.

4.2.2. We have reviewed and summarised the character area boundaries and key characteristics for the Landscape Character Areas that relate to the LGV in paragraphs 2.15 - 2.25 above. In summary, the character assessment generally exhibits a set of key characteristics that reflect the landscape character of the LGV and areas to the north and south, however it is now out of date in the vicinity of the TVSP. In addition, the boundaries of the landscape character areas do not follow clearly distinguishable boundaries 'on the ground'.

Proposed Changes:

The Landscape Character Assessment should be reviewed and updated to provide:

- *Updated boundaries that follow clearly recognizable features on the ground where possible*
- *Updated key characteristics and character area boundaries where recent development has taken place, such as the Thames Valley Science Park and residential and infrastructure development on the eastern side of Shinfield (Area J3)*

4.3. Wokingham Borough Council PPG17 Open Space, Sport & Recreation Audit Update: Final Amended Open Space Assessment Report (February 2012)

4.3.1. This Audit was based on PPG17 methodology. PPG as replaced by the National Planning Policy Framework in March 2012. The Assessment was based on consultation with local stakeholders and included reviews of the value and quality of a number of existing green spaces. Given that the assessment was undertaken over 12 years ago, its findings may not be reliable.

4.3.2. Whilst the findings of the Open Space Audit may no longer be accurate, it does highlight that in 2012 the Borough had a shortfall of 67 ha of natural greenspace (page 53). Most parks scored low for quality against the Green Flag criteria (page 51) and most play area equipment needed updating to meet the current DDA standards. Nearly a third of young people considered that there was a lack of teenage play facilities in the borough (page 87). Whilst there was an more allotment space than required by PP17, there were relatively long waiting lists, indicating that demand wasn't being met by supply (page 99).

4.3.3. Overall, based on the 2012 findings, the LGV therefore provides opportunities to enhance both the quantum and quality of a variety of public open space typologies within the Borough. It is recognised that the reliability of the Open Space Audit may be relatively limited however.

Proposed Changes:

The Open Space Audit Assessment should be reviewed and updated to comply with any changes to open space standards and take on board changes to supply and demand that have arisen since the Assessment was undertaken in 2012.

4.4. Wokingham Valued Landscapes Assessment (Wokingham Borough Council, 2024)

4.4.1. The Valued Landscape Assessment (2024) provides an update to the Valued Landscapes Topic Paper (2020). The Assessment describes how the National Planning Policy Framework (NPPF, 2023) requires development to contribute and enhance the natural and local environment and protect and enhance valued landscapes (NPPF paragraph 180). It also describes how paragraph 181 of the NPPF states that Plans should distinguish between the hierarchy of international, national and locally designated sites. It also describes how the National Planning Practice Guidance notes *'Where landscapes have a particular local value, it is important for policies to identify their special characteristics and be supported by proportionate evidence. Policies may set out criteria against which proposals for development affecting these areas will be assessed* (Paragraph: 036 Reference ID 8-036-20190721).

4.4.2. We consider that the Valued Landscapes Assessment provides a thorough assessment of the characteristics of the proposed draft Valued Landscapes. This includes boundaries based on physical features and the identification of key attributes and valued characteristics of each area. The relevant valued characteristics for the Valued Landscapes are replicated in Table 2.1 above. As described in paragraphs 3.15 to 3.28 above, a number of characteristics of the 'River Loddon' Valued Landscape are particularly relevant to the LGV study area. The boundaries of the Valued Landscape however, include a number of areas that do not meet with the definitions of a high value and distinctive landscape and are conflicting with the proposed areas for development shown on the LPU Figure 8 Concept Plan.

4.4.3. As described in Section 3 above, we recommend that the boundaries of the Valued Landscape should be reviewed and amended.

4.5. Local Green Spaces Assessment Report (September 2024)

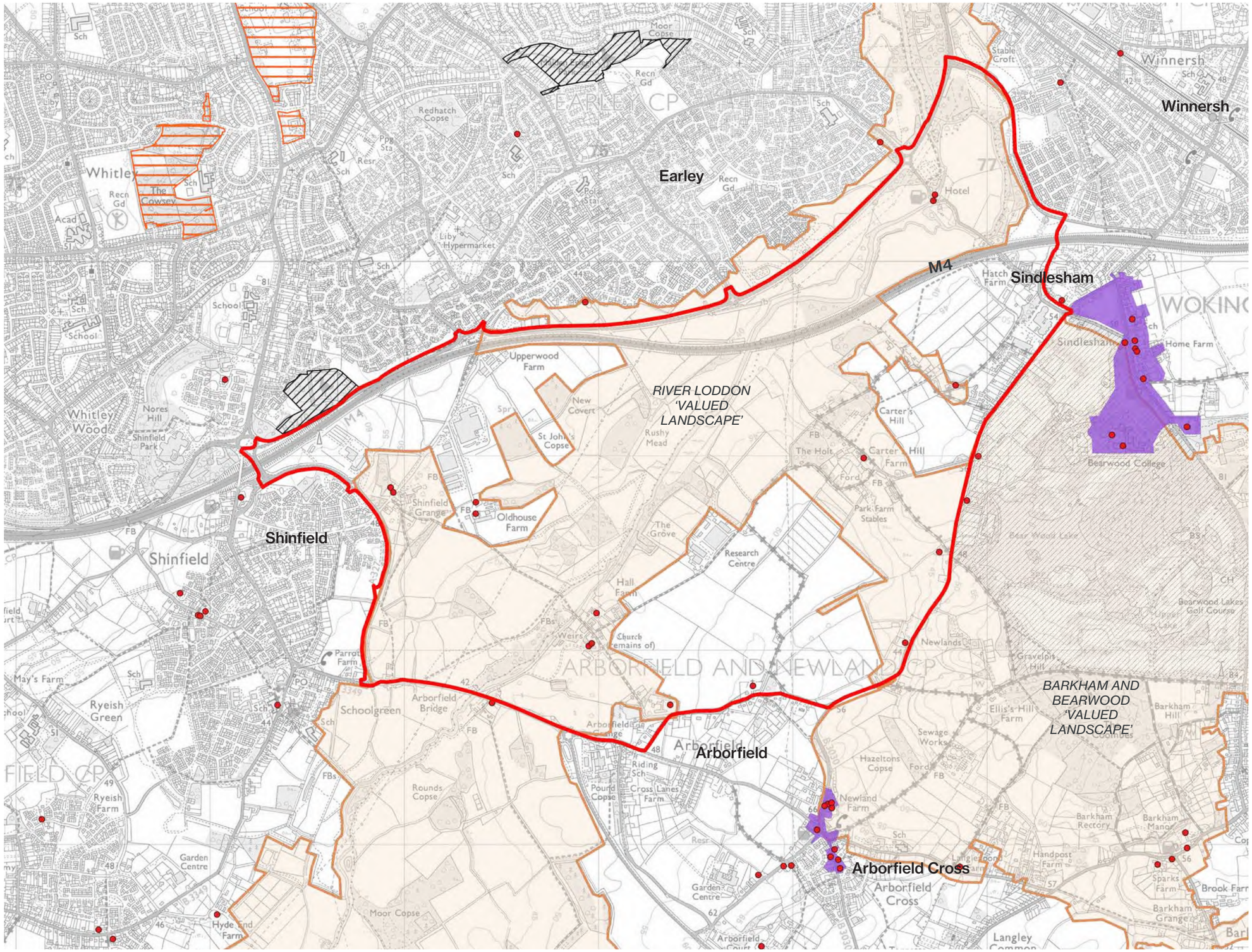
4.5.1. The Local Green Spaces Assessment Report explains the process that WBC has followed to identify and select nominated Local Green Spaces. These are covered by emerging Policy HC3 which seeks to protect them from inappropriate development unless very special circumstances are demonstrated.

4.5.2. There are no nominated Local Green Spaces within the proposed Loddon Garden Village area, the closest being LGS044 (Bearwood) to the east and LGS015 (Pound Copse, Arborfield) to the south. Neither of these are connected to the LGV.

4.5.3. The proposed development at LGV would not affect any nominated Local Green Spaces.

Appendices

Appendix 1
Savills Landscape and Visual Context Drawings



Garden Village Maximum Extents

Heritage Designations

Listed Building

Conservation Area

Landscape Designations

Major Landscape Feature - Policy EN13

Registered Park and Garden - Bearwood College

Wokingham Borough Council draft 'Valued Landscape' (emerging policy NE6)

N

Loddon Garden Village

on behalf of the University of Reading

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drawing no.	LA115	drawing	**Figure 1:** Reg 19 Review - Landscape Designations
revision	-	scale	1:20,000 @A3
drawn by	JM	checked by	RB
date	11.10.2024	job no.	498048

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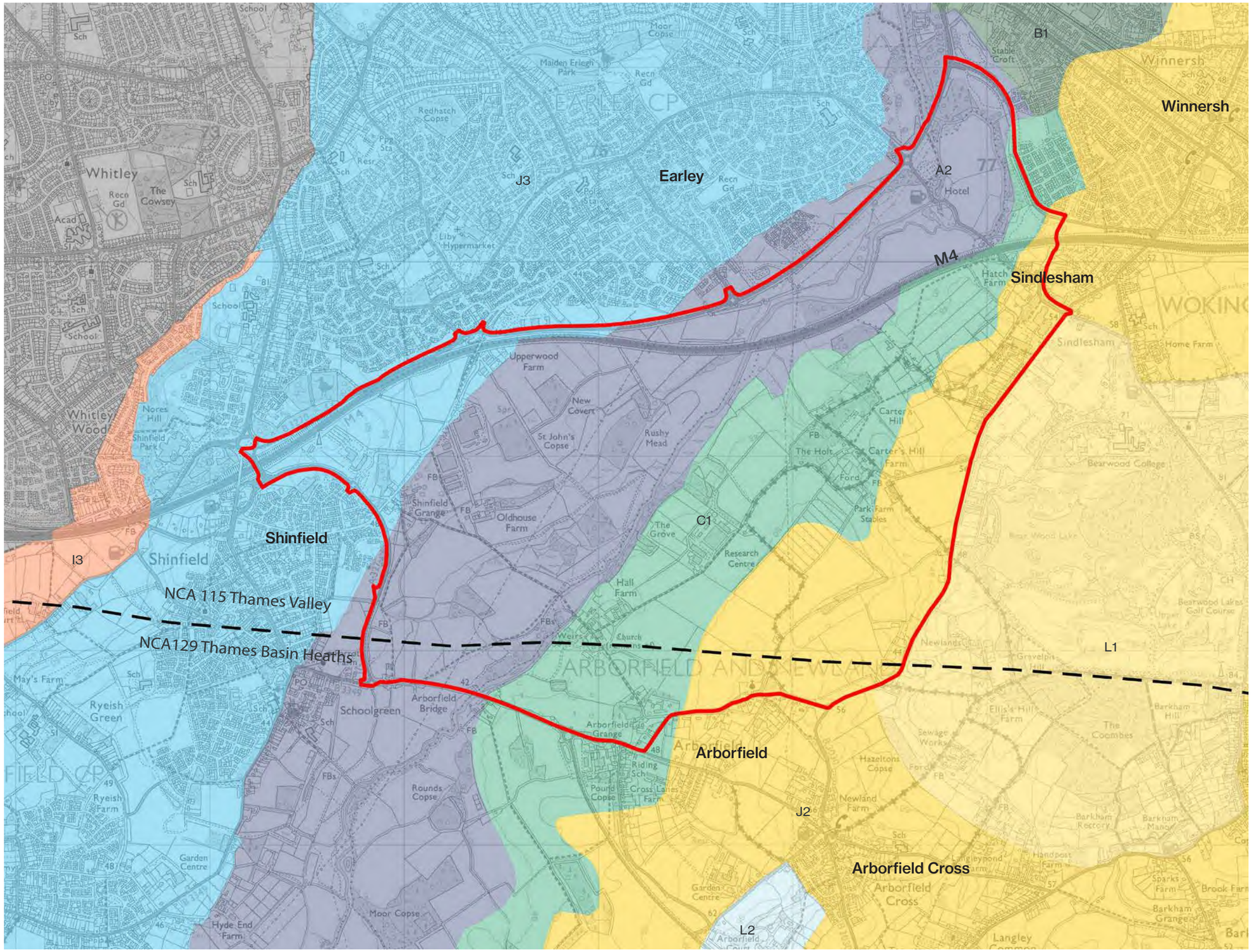

Garden Village Maximum Extents

National Character Areas

National Character Area Boundary

Urban Area - Reading

Wokingham Borough Council Landscape Character Assessment

The River Landscapes

Type A: River Valley

A2 - Loddon River Valley

Type B: River Valley with Open Water

B1 - Loddon River Valley with Open Water

Type C: River Terrace

C1 - Arborfield River Terrace

The Clay Landscapes

Type I: Farmed Clay Lowlands

I3 - Grazeley Farmed Clay Lowland

Type J: Settled and Farmed Clay

J2 - Aborfield and Barkham Settled and Farmed Clay

J3 - Spencers Wood Settled and Farmed Clay

The Sand Landscapes

Type L: Wooded Sand and Gravel Hills

L1 - Bearwood Wooded Sand and Gravel Hills

L2 - Farley Hill Wooded Sand and Gravel Hills

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on behalf of the University of Reading

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drawing no.	LA116	drawing	**Figure 2:** Reg 19 Review - Landscape Character
revision	-	scale	1:20,000@A3
drawn by	JM	checked by	RB
date	03.10.2024	job no.	498048

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Garden Village Maximum Extents

Site Character Areas

CA1 - Thames Valley Science Park

CA2 - Loddon Valley

CA3 - Arborfield Hall River Terrace

CA4 - Loddon East River Terrace

CA5 - Mole Road & Sindlesham

CA6 - Hatch Farm River Terrace

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on behalf of the University of Reading

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drawing no.	LA117	drawing	**Figure 3:** Reg 19 Review - Site Landscape Character
revision	-	scale	1:20,000@A3
drawn by	JM	checked by	RB
date	03.10.2024	job no.	498048

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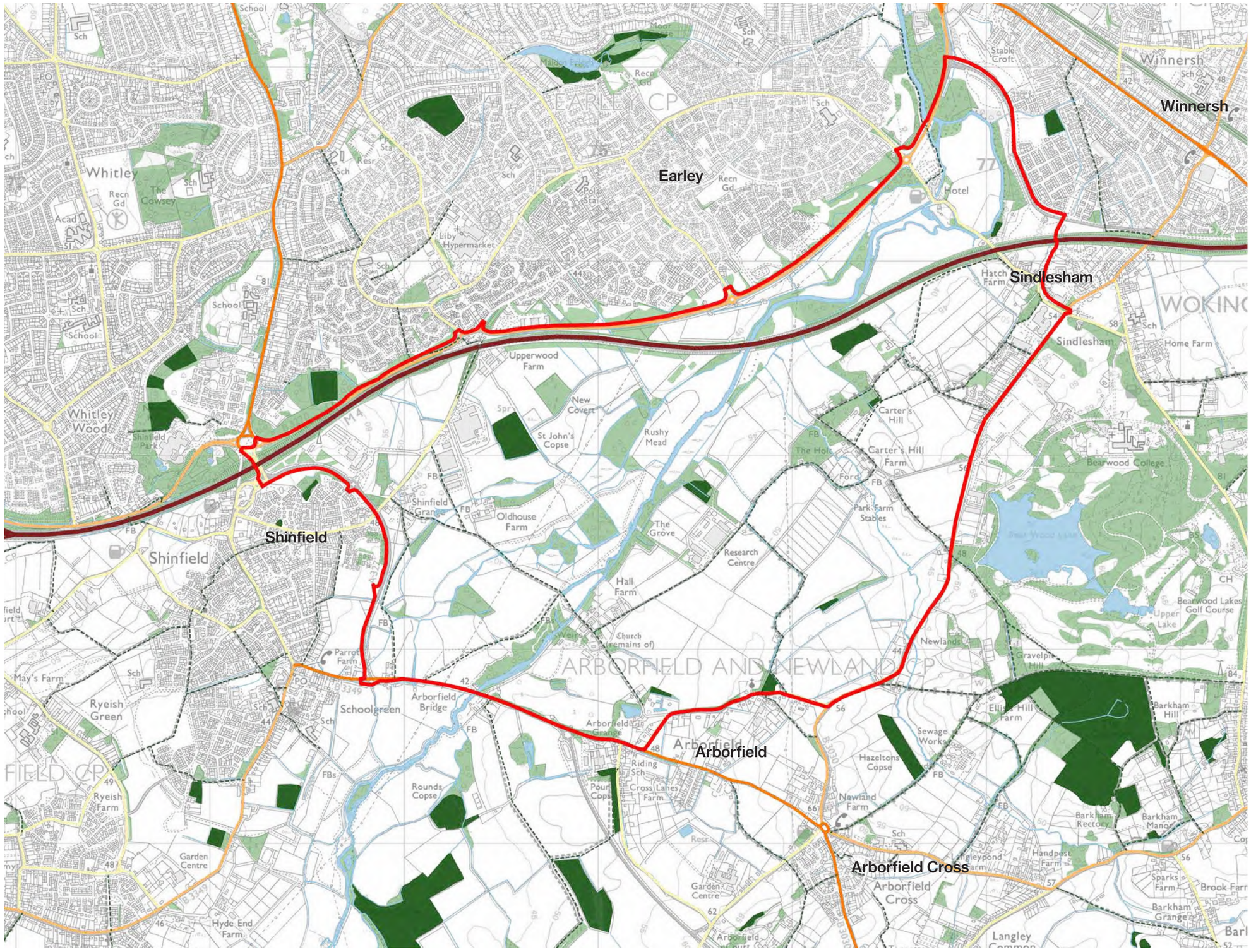

Garden Village Maximum Extents

Landscape Context

Water Body

Woodland

Ancient Woodland

Movement & Access Context

Public Right of Way

Motorway

A Road

B Road

Primary Road

Minor Road

N

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drawing no.	LA118	drawing	**Figure 4:** Reg 19 Review - Landscape and Movement Context
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drawn by	JM	checked by	RB
date	03.10.2024	job no.	498048

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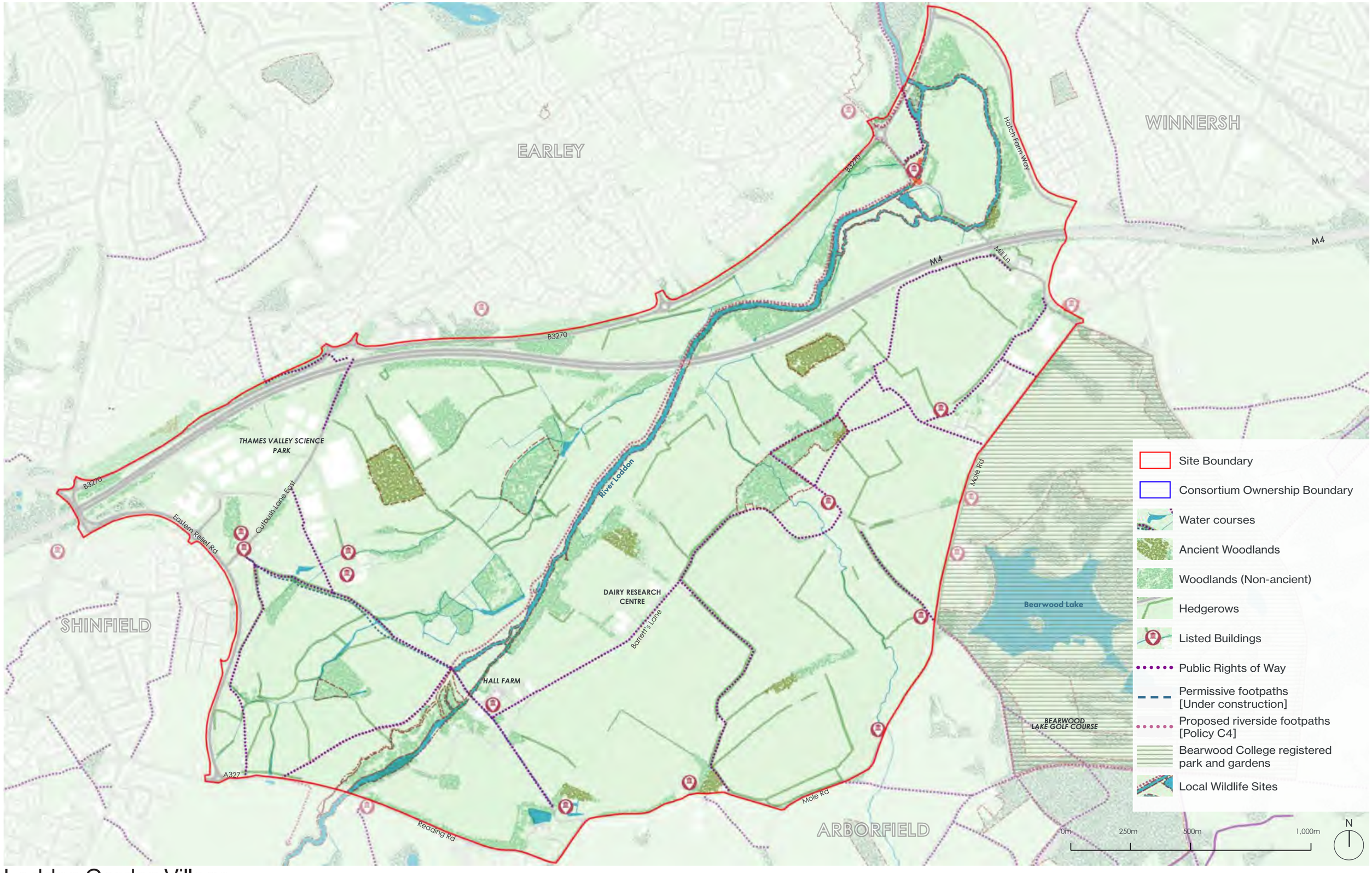

Loddon Garden Village

on behalf of University of Reading

drawing no.	LA119	drawing	**Figure 5:** Reg 19 Review: Site Landscape Features
revision	-	scale	1:14,000 @A3
drawn by	JM	checked by	RB
date	01.10.2024	job no.	481677

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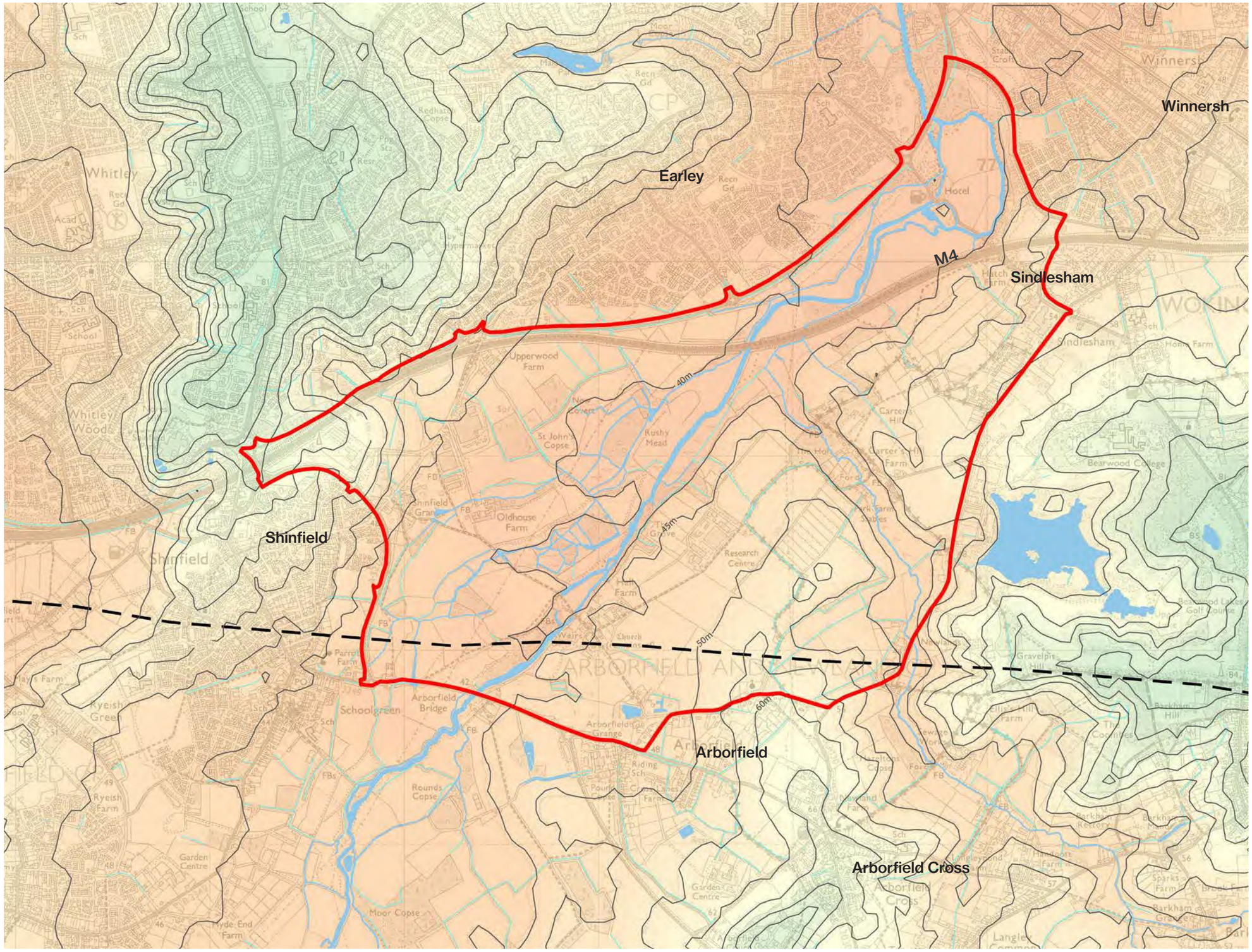
savills



Garden Village Maximum Extents

Surface Water

5m Contours

20m Above Ordnance Datum (AOD)

100m AOD

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on behalf of the University of Reading

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drawing no.	LA120	drawing	**Figure 6:** Reg 19 Review - Landform and Water Features
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drawn by	JM	checked by	RB
date	03.10.2024	job no.	498048

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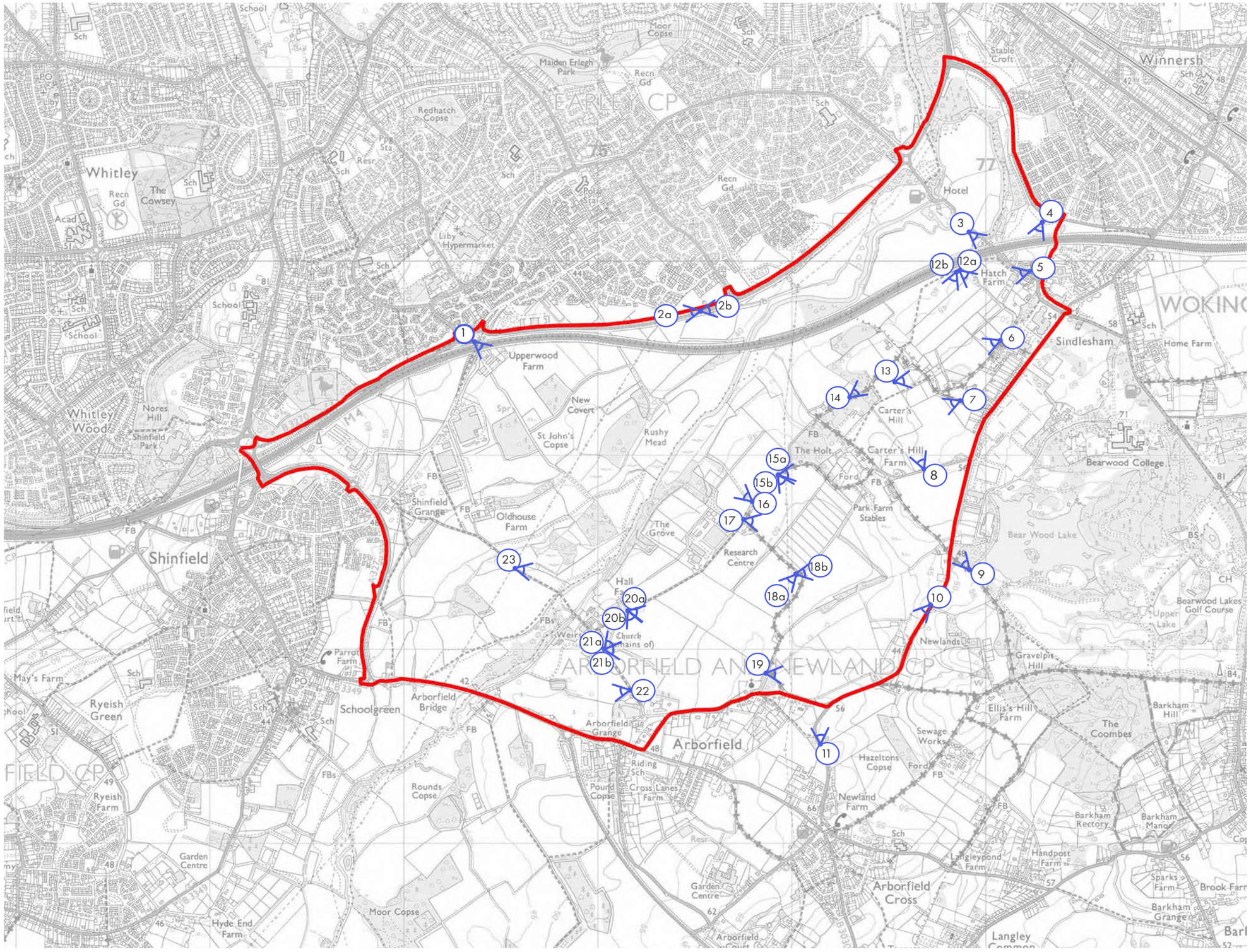

Loddon Garden Village

on behalf of the University of Reading

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drawing no.	LA121	drawing	**Figure 7:** Reg 19 Review - Proposed Photography Viewpoints
revision	-	scale	1:20,000@A3
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 1: *From footbridge over M4 motorway looking to south-east. Mature trees screen views towards the proposed Thames Valley Science Park and Loddon Garden Village beyond. The new motorway bridge would be visible in the distance in the context of the existing motorway infrastructure.*

View 2a: *From Lower Earley Way, looking to the west, towards the proposed link road and bridge over the M4. Trees screen views towards the M4 and beyond, however the new bridge and road would necessitate some vegetation removal. The new bridge and road infrastructure would be visible, but in the context of an existing highways-dominated view.*

Loddon Garden Village

on behalf of the University of Reading

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drawing no.	LA122	drawing	**Figure 8:** View 1 and 2a
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 2b: *From Lower Earley Way, looking to the west, towards the proposed link road and bridge over the M4. Trees screen views towards the M4 and beyond, however the new bridge and road would necessitate some vegetation removal. The new bridge and road infrastructure would be visible, but in the context of an existing highways-dominated view.*

View 3: *From Mill Lane looking south towards the M4 bridge. A new roundabout would be visible here. Whilst this would result in a change to the view, the existing bridge and road have already affected the value of the view and visual receptors would be 'low' sensitivity.*

Loddon Garden Village

on behalf of the University of Reading

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drawing no.	LA123	drawing	**Figure 9:** View 2b and 3
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 4: *From Hatch Farm Way looking to the south-west. This view will change to include a new access road through an area of open space. Whilst a new access road would result in a change to the view, the existing road has already affected the value of the view and visual receptors would be 'low' sensitivity.*

View 5: *From Mill Lane, looking to the north-west. This view will change to include new buildings and access road to the site, at Hatch Farm. Whilst a new access road and buildings would result in a change to the view, the existing road has already affected the value of the view and visual receptors would be 'low' sensitivity. Mitigation planting and high quality buildings would minimise visual effects.*

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drawing no.	LA124	drawing	**Figure 10:** View 4 and 5
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 6: *From Gipsy Lane to the south of Hatch Farm looking north-west. Mature hedgerows screen views of the proposed development area, even during the winter months. Glimpsed views towards the M4 motorway erode the rural character of the view.*

View 7: *From Betty Grove Lane, looking west. The foreground setting of the lane would remain undeveloped however there is the potential for views of new homes in the middle distance. These could be screened with generous tree planting along the intervening boundaries, to retain the rural setting of the lane.*

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drawing no.	LA125	drawing	**Figure 11:** View 6 and 7
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 8: *From Parkcorner Lane looking north. Much of this area would be retained as open space, with the potential for play, food growing, tree planting and meadows. Existing trees and hedgerows would be retained. There may be views of new houses in the distance, however, these can be softened/screened with tree planting.*

View 9: *From Gravelpit Hill off Mole Road, looking north-west. Foreground vegetation and avoidance of development adjacent to Mole Road mean that new homes would not be visible.*

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drawing no.	LA126	drawing	**Figure 12:** View 8 and 9
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 10: *From Sindlesham Road/Mole Road junction, looking west. There could be views of new homes beyond the woodland belt and in the distance on the left hand side of the photograph. These views of new homes could be screened with additional woodland planting.*

View 11: *From Mole Road looking north. New homes could be glimpsed from a short stretch of road to the south however there is generous buffer of open space available for tree planting to soften views of the new homes.*

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drawing no.	LA127	drawing	**Figure 13:** View 10 and 11
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 12a: *From Hatch Farm, looking to south-east. The landscape is dominated by pony paddocks, with glimpses of housing at Sindlesham in the distance. Overhead cables and telecom masts further diminish the rural character of the view..*

View 12b: *From Hatch Farm, looking to south. The landscape is dominated by pony paddocks, with glimpses of the M4 further diminishing the rural character.*

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drawing no.	LA128	drawing	**Figure 14:** View 12 and 13
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 13: *From public right of way to the north of Carter's Hill, looking north. This area will form part of large new area of open space which can incorporate additional trees, food growing and play facilities. New homes are proposed in the middle distance. Whilst these can be filtered by new trees, the overall rural character of the view will change.*

View 14: *From Public Right of Way to the north of Carter's Hill, looking north-east. The new spine road is likely to briefly join the alignment of this footpath in the middle distance. The wooded nature of the view will be retained, forming an attractive setting to the new street.*

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drawing no.	LA129	drawing	**Figure 15:** View 13 and 14
revision	A (11.11.24)	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 15a: *From Public Right of Way to the west of Carter's Hill looking north-east. A new street within a leafy setting will retain the alignment of the footpath space retaining an attractive foreground. New houses would be visible in the middle distance however these could be filtered by trees.*

View 15b: *From Public Right of Way to the south of Carter's Hill looking to the south. A new street within a leafy setting will retain the alignment of the footpath space retaining an attractive foreground. New houses would be visible beyond this, potentially filtered by trees.*

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drawing no.	LA130	drawing	**Figure 16:** View 15a and 15b
revision	A (11.11.24)	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 16: *From Public Right of Way to the north of the Centre for Dairy Research, looking north. A new street within a leafy setting will retain the alignment of the footpath space retaining an attractive foreground. New houses would be visible beyond, however, these could be filtered by trees.*

View 17: *From Public Right of Way to the north of the Centre for Dairy Research looking to north. Carter's Hill is visible in the distance, together with pylons and overhead cables. A new street within a leafy setting will retain the alignment of the footpath space retaining an attractive foreground. New houses would be visible beyond, however, these could be filtered by trees.*

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drawing no.	LA131	drawing	**Figure 17:** View 16 and 17
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 18a: *From Public Right of Way to the south of the Centre for Dairy Research looking to the south-west. This green lane will be conserved in a generous green corridor, with a large open space in the foreground. New homes will be visible in the middle distance, with views filtered by trees within the proposed par as well as the existing hedgerow.*

View 18b: *From public right of way to the south of the Centre for Dairy Research looking to the north-east. This green lane will be conserved in a generous green corridor. New homes will be visible nearby however views will be filtered by trees within the proposed park as well as the existing hedgerow.*

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drawing no.	LA132	drawing	**Figure 18:** View 18a and 18b
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 19: *From field gateway adjacent to a footpath to the north of Arborfield, looking north. This green lane will be retained within a generous green space, meaning views will continue to be filtered by the existing and proposed hedgerows and trees. Potential effects will be dependent on the detailed landscape and architectural design of the masterplan.*

View 20a: *From footpath to the north of Hall Farm, looking north. This route will be retained within a green corridor/avenue. Whilst there will be a distinct change to this rural view, given that it is dominated by intensive agriculture with large field sizes, its visual amenity and landscape character has been slightly eroded. The hedgerow trees in the distance will be retained as part of the green corridor network for the site and the development provides the opportunity for new diverse areas of open space which will provide an attractive setting to the new housing areas.*

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drawing no.	LA133	drawing	**Figure 19:** View 19 and 20a
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 20b: *From footpath to the north of Hall Farm, looking to the south-east. The spire of St. Bartholomew's Church is visible in the distance. This route will be retained within a green corridor/avenue and there is the potential for clear vistas of the spire to be retained. Whilst there will be a distinct change to this rural view, given that it is dominated by intensive agriculture with large field sizes, its visual amenity and landscape character has been slightly eroded. The hedgerow trees in the distance will be retained as part of the green corridor network for the site and the development provides the opportunity for new diverse areas of open space which will provide an attractive setting to the new housing areas.*

View 21a: *From public footpath to the north of Arborfield looking north along the historic avenue within the original Arborfield Hall parkland. The masterplan conserves the setting and route of this footpath but new homes would be visible beyond. Whilst there would be a clear change to the setting of this route, the new village can complement the mature setting, creating an attractive new view with a strong management plan for the conservation and restoration of the mature parkland.*

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drawing no.	LA134	drawing	**Figure 20:** View 20b and 21a
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 21b: *From public footpath to the north of Arborfield looking east towards St. Bartholomew's Church. The masterplan conserves the setting and route of this footpath but new homes would be visible beyond. The proposal for school playing fields nearby could provide opportunities to retain open views towards the church, as shown in the emerging Savills masterplan.*

View 22: *From public footpath to the north of Arborfield looking south across the site of the remnant Arborfield Hall parkland. Whilst areas of pasture and trees remain, the overall structure and character of the original park has weakened since the Hall was destroyed by fire. The masterplan conserves the setting and route of this footpath but new homes would be visible beyond. These would be set in a wider area of open spaces however, which could reflect and restore the parkland character.*

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drawing no.	LA135	drawing	**Figure 21:** View 21b and 22
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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View 23: *From Public Right of Way to the north of the River Loddon, looking south. Mature trees along the river provide good screening to the area beyond, and it is unlikely that new homes would be visible from here. This area would form part of the proposed country park and SANG however, so there are likely to be changes to the views associated with new planting and landscape management as well as changes to footpath layouts. These are unlikely to be harmful and may be beneficial, depending on the detailed landscape design of the layout.*

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drawing no.	LA136	drawing	**Figure 22:** View 23
revision	-	scale	-
drawn by	JM	checked by	RB
date	09.10.2024	job no.	498048

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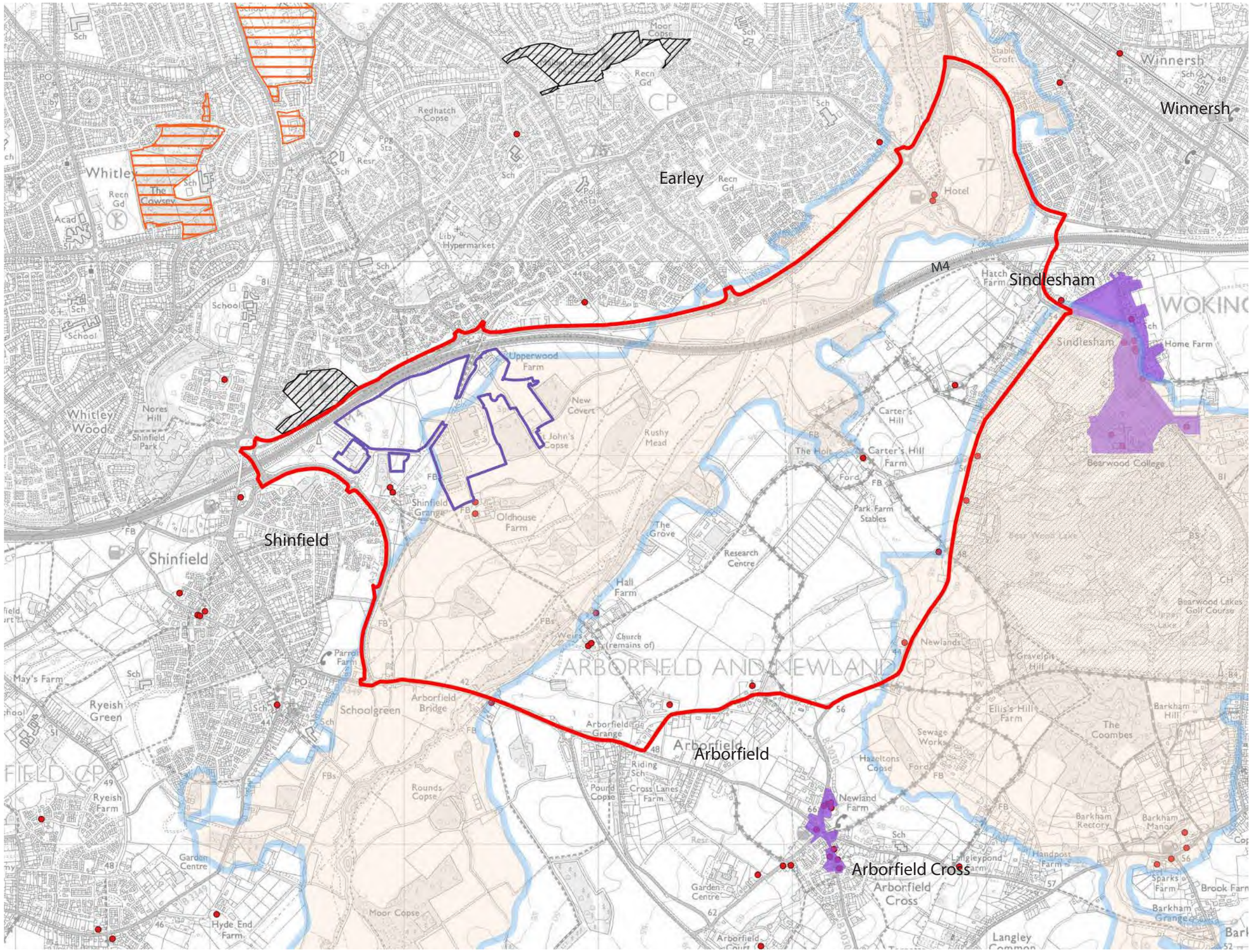
Appendix 2
River Loddon and Barkham and Bearwood Valued Landscapes: 2020 Boundaries



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drawing no.	LA003	drawing	Landscape Designations
revision	B(11.07.2024)	scale	1:20,000
drawn by	YH/JM	checked by	RB
date	08.04.2022	job no.	498048

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LODDON GARDEN VILLAGE
REGULATION 19 CONSULTATION
DRAINAGE TECHNICAL REPORT

UNIVERSITY OF READING

11 NOVEMBER 2024

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Date:	11 November 2024
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Contents

Appendices

1.0 Introduction

Context

1.1. This Technical Report has been prepared by Abley Letchford Partnership Ltd (ALP), on behalf of the University of Reading, to support Wokingham Borough Council's (WBC) Local Plan Update (LPU) Regulation 19 consultation, in particular in relation to the proposed allocation of the Loddon Garden Village (LGV) via Policy SS13.

1.2. Through the provision of a comprehensive site-wide approach to sustainable drainage and flood mitigation, the overarching Drainage Strategy will support the Place Shaping, Landscaping, Green/Blue Infrastructure Principles stipulated within the Policy SS13 text.

1.3. Specifically, under Drainage Flood Alleviation in part 7 of the Policy, it will.

"… devise and implement a comprehensive drainage and flood alleviation strategy that:

a) Provides high quality sustainable drainage systems (SuDS) that are integrated into the wider landscape and green and blue infrastructure strategy, including mitigation at source and makes a positive contribution to attractive open spaces, and improvement to biodiversity and water quality;

b) Considers and takes opportunity as appropriate to improve the management of flood risk and reduce the risk of flooding to areas beyond the garden village; and

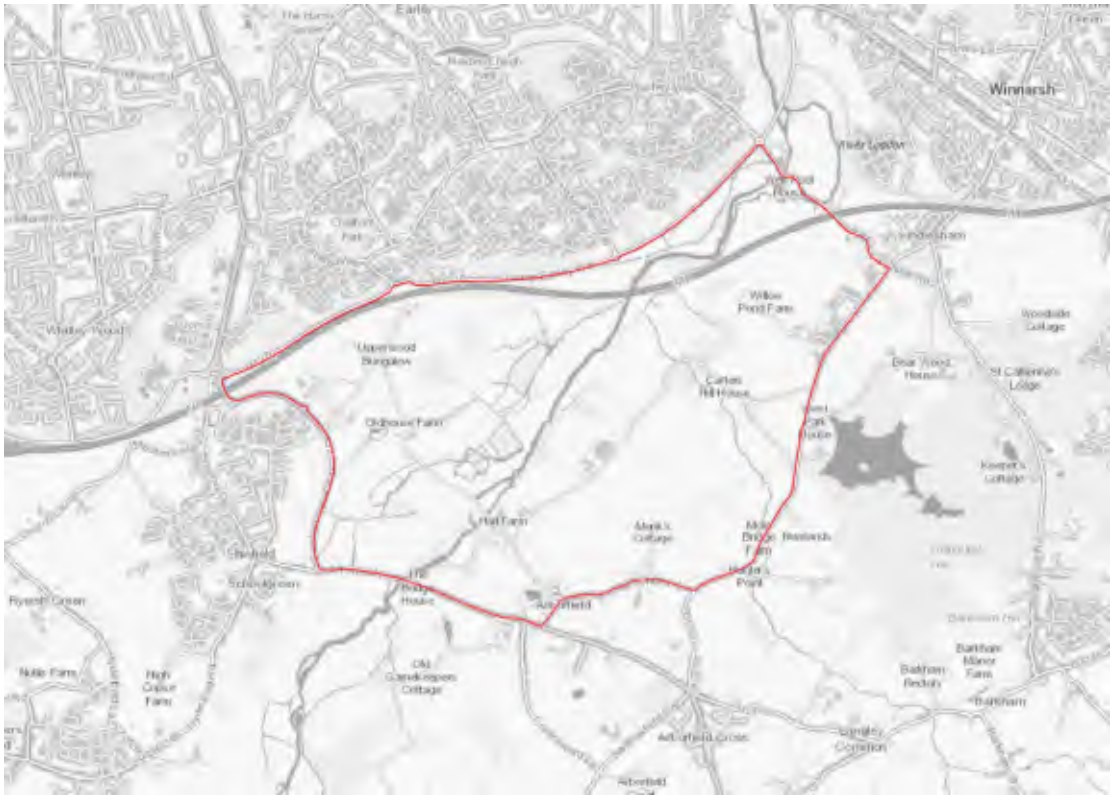
c) Establishes clear and robust arrangements for future maintenance."

1.4. Through adherence to the key place making principles set out within the Development Guidelines contained within Appendix C of the LPU (B4.5k and B4.5L), the overarching Drainage Strategy will support the creation of a sustainable, safe, well designed, attractive community, which is able to respond to potential changes associated with climate change and flood risk.

Site Location and Development Proposals

1.5. The LGV is located in Shinfield parish, Arborfield & Newland parish and Earley parish, to the south of Reading. The site spans the River Loddon in Berkshire and the site centre grid reference is 475,750E, 168,650N. The site location is shown in **Figure 1**.

Figure 1 - Site location plan



1.6. The site consists predominantly of large agricultural fields, enclosed by hedgerow and tree boundaries. There are some farm and research buildings within the site boundary.

Structure of the Strategy

1.7. The structure of this Report utilises the following section headings:

- Section 2: Site Analysis/Baseline Condition
- Section 3: Consultation and Engagement
- Section 4: National and Local Requirements/Compliance
- Section 5: Surface Water Drainage Overview
- Section 6: Foul Water Drainage Overview
- Section 7: Summary

2.0 Site Analysis/Baseline Condition

2.1. The Site is located in Wokingham Borough, and it is primarily a greenfield site with some brownfield areas.

2.2. Following numerous site walkovers, the site's drainage system has been observed to be heavily influenced by natural watercourses, most notably the River Loddon and Barkham Brook, which both bisect the site. The River Loddon flows from the southwest to the northeast, while Barkham Brook runs from southeast to northwest, eventually discharging into the River Loddon. These watercourses play a significant role in the site's drainage, with much of the water flowing through these channels.

2.3. In addition to these major water bodies, the site also has a complex network of field drainage features and unnamed watercourses. These smaller watercourses drain into both the River Loddon and Barkham Brook, particularly in the north and northwest parts of the site. The drainage in the southeast flows towards Barkham Brook, while the northern and far southern areas drain towards the River Loddon.

2.4. The topography of the site, which generally slopes towards the River Loddon and Barkham Brook, further enhances the drainage patterns, with water moving naturally towards these lower-lying areas. However, this also creates areas of flood risk, particularly around the watercourses. The site's natural drainage is affected by both fluvial flooding from the rivers and surface water accumulation during heavy rainfall. There is also a raised motorway (M4) running through the northern part of the site, which can act as a barrier and cause localised ponding of surface water runoff.

2.5. Site observations of drainage connectivity has been supplemented by the provision of topographic and LIDAR survey data. This has included the capture of a significant expanse of watercourse channel cross sectional information, bed level and conduit data, which has allowed the creation of an expansive hydraulic model for the project.

2.6. This baseline model and survey data has provided the Project Team with a wealth of information for verification and assessment, be this ground level, direction of fall, or watercourse capacity. This dataset has been fundamental in identifying optimum locations for proposed development parcels, primary attenuation features and natural conveyance routes for surface water.

2.7. A desktop review of soils has identified a mixture of loamy and clayey types, with naturally high groundwater levels, which can influence drainage efficiency. This initial review has been supplemented by the provision of intrusive Geotechnical Investigations in the form of trial pits, window sampling and groundwater monitoring; all of which assists with the derivation of the comprehensive overarching Drainage Strategy.

2.8. In respect to foul effluent, public sewer asset mapping has been obtained from Thames Water, as the regional sewerage provider. In the main, these sewers reside predominately outside of the LGV boundary, within adjacent public highway. These sewers have been drafted and assessed for possible points of connection in coordination with Thames Water.

3.0 Consultation and Engagement

Introduction

3.1. This chapter sets out consultation and engagement with key stakeholders.

Thames Water

3.2. Thames Water is the regional sewerage provider for the Site, and as such, has been a key stakeholder in discussions to date in respect to foul water disposal.

3.3. Thames Water provided comments to the Council on the Draft Plan (2020) and Revised growth Strategy (2021) and went on to sign an MoU with respect to the Water Cycle Studies confirming that the Water Cycle Study evidence is robust and adequate water infrastructure can be delivered to support growth.

3.4. Discussions between the Project Team and Thames Water have been taking place since early 2021. This has involved initial informal workshops to introduce the general premise of development within Thames Valley Science Park and wider Loddon Garden Village which cumulated with a formal Pre-Planning Enquiry (PPE) being lodged in March 2022.

3.5. At this time, this PPE promoted up to 4500 units alongside a possible relocation of the Royal Berkshire Hospital, neighbourhood centres, schools, and retail offerings. The quantum of development has since been rationalised to that presented within the Local Plan Update i.e. up to 3930 units.

3.6. This initial Pre-Planning Enquiry established inadequate sewer capacity within the immediate vicinity, and inadequate sewage treatment at the nearby Arborfield Water Recycling Centre (WRC).

3.7. The Project Team and Thames Water hold regular meetings and workshops to formulate the overall foul water drainage strategy for this Site in an appropriate and timely manner.

Wokingham Borough Council

3.8. Wokingham Borough Council as the Lead Local Flooding Authority (LLFA) and are fundamental in the oversight of site-wide surface water provision and discharge rates. Their requirements for sustainable drainage systems and integrated blue-green infrastructure have been pivotal in the evolution of the overall surface water strategy.

3.9. As part of the Local Plan Update, several technical workshops have been undertaken with the Council, specifically Flood Risk, Drainage, Landscape and Ecology Officers.

3.10. Coupled with long standing established professional relationships with Officers, the Project Team have been able to embrace requirements and visions emanating from these workshops to refine the Drainage Strategy as it emerged.

3.11. The Project Team will continue to work with the Council as the scheme progresses.

4.0 National and Local Requirements/Compliance

Introduction

4.1. This chapter provides a review of National and Local policy relevant to the proposals and provides confirmation of compliance.

National Planning Policy Framework

4.2. The National Planning Policy Framework (NPPF) 2023 provides vital guidance on managing surface water drainage in the UK to ensure that new developments are resilient to flood risks and contribute to sustainable urban planning. The NPPF, along with its supporting Planning Practice Guidance (PPG), emphasizes the importance of mitigating surface water flooding, particularly in areas with increased impermeable surfaces, which can lead to higher runoff rates.

4.3. NPPF calls for surface water disposal to follow a hierarchical approach as does Part H3 of the Building Regulations 2015. The three possible options listed in order of priority are:

- discharge into the ground (infiltration); or, where that is not reasonably practicable,
- discharge to a surface water body (river, watercourse); or where that is not reasonably practicable,
- discharge to a sewer, highway drain, or another drainage system.

Key NPPF Policies on Surface Water Management

4.4. The NPPF, supported by the PPG, emphasises the importance of managing surface water runoff effectively to reduce flood risks. The key principles of the NPPF regarding surface water drainage strategies include:

- **Minimizing Flood Risk Through Planning**

4.5. The NPPF requires local planning authorities to steer development away from areas at high risk of flooding through the application of the Sequential Test. This test ensures that new developments are located in areas with the lowest possible flood risk. However, when development must occur in areas at risk of flooding, the NPPF mandates the application of surface water management strategies to mitigate flood risk both at the development site and downstream.

4.6. Under paragraph 159 of the NPPF, local authorities must ensure that developments in flood-prone areas are resilient to current and future flood risks. Developers are expected to incorporate effective surface water management strategies into their proposals, especially in areas with a significant risk of surface water flooding.

- **Encouraging the Use of Sustainable Drainage Systems (SuDS)**

4.7. The NPPF promotes the use of Sustainable Drainage Systems (SuDS) as a preferred method of managing surface water in new developments. SuDS are designed to manage surface water as close to the source as possible, mimicking natural drainage processes by allowing water to infiltrate the ground, reducing runoff rates, and providing water quality benefits.

4.8. The Flood and Water Management Act 2010 and subsequent guidance reinforce the expectation that SuDS should be implemented in most major developments, particularly those with a significant amount of hard, impermeable surfaces. The NPPF's guidance encourages local authorities and developers to prioritize the use of SuDS over conventional drainage systems. These systems not only reduce the risk of surface water flooding but also provide environmental benefits such as improved water quality, biodiversity enhancement, and the creation of public amenities.

4.9. The NPPF paragraph 165 specifically states that major developments should incorporate SuDS unless there is clear evidence that it would be inappropriate. The expectation is that surface water runoff rates should be reduced to the pre-development greenfield rate or as close as possible to it, ensuring that developments do not exacerbate flood risks downstream.

- **Site-Specific Flood Risk Assessments**

4.10. The NPPF requires that site-specific flood risk assessments (FRA) be carried out for all developments in areas at risk of flooding, or for developments over 1 hectare in size in areas not considered to be at flood risk. The FRA must include detailed information on surface water management, demonstrating how runoff will be managed on-site and that the proposed development will not increase flood risks elsewhere.

4.11. The FRA should also take into account the potential impacts of climate change, with increased rainfall and more intense storm events being anticipated. In line with the NPPF, surface water management strategies must therefore ensure that development is resilient to both current and future risks, considering a minimum of a 30% increase in peak rainfall intensity over the lifetime of the development.

NPPF Requirements for Surface Water Drainage Strategies

4.12. Surface water drainage strategies, as set out in the NPPF, must be designed to manage runoff in a way that prevents increased flood risk both on-site and off-site. Key considerations outlined by the NPPF and PPG include:

- **Runoff Rates and Volumes**

4.13. The primary objective of a surface water drainage strategy is to manage runoff rates and volumes. The NPPF advises that the post-development runoff should not exceed pre-development rates. This is particularly important in urban areas where impermeable surfaces, such as roads and rooftops, can dramatically increase runoff. Developers are expected to demonstrate that their proposals include adequate storage for excess runoff during heavy rainfall events, typically through features like attenuation basins, ponds, and storage tanks.

- **Infiltration and Natural Drainage**

4.14. Wherever possible, the NPPF encourages the use of natural drainage techniques, such as infiltration, to manage surface water. In areas with suitable soil conditions, infiltration systems such as soakaways or permeable pavements should be prioritised. These systems allow water to infiltrate the ground, replenishing groundwater supplies and reducing the amount of runoff that enters drainage networks.

- **Surface Water Treatment**

4.15. The NPPF also requires that surface water management strategies address water quality. This involves treating runoff to remove pollutants before the water is discharged into rivers, streams, or groundwater. SuDS components, such as swales, wetlands, and retention ponds, can provide both water treatment and storage, helping to improve the quality of water being released from the site.

- **Long-Term Management and Maintenance**

4.16. Another key aspect of surface water management under the NPPF is ensuring that systems are maintained over the long term. SuDS and other drainage systems must have clear maintenance plans to ensure they remain effective throughout the life of the development. Local planning authorities are encouraged to seek assurances from developers regarding the long-term management of these systems, including funding and maintenance responsibilities.

National Design and Construction Guidance (DCG)

4.17. The Code for Adoption of Foul and Surface Water Sewers offers comprehensive guidance for developers when planning and constructing drainage systems that will be adopted by sewerage companies under Section 104 of the Water Industry Act 1991. This document is pivotal in ensuring proper management of water resources, flood risks, and environmental impact in new developments.

4.18. The code ensures that drainage systems are designed to manage both foul and surface water effectively, reducing pollution risks to nearby water bodies. Sustainable Urban Drainage Systems (SuDS) are encouraged to manage surface water runoff in an environmentally friendly way.

4.19. Developers are required to explore the surface water hierarchy and implement strategies that reduce the risk of flooding. This includes the use of infiltration systems, watercourse discharge, or, as a last resort, the public sewer system. Proper design considerations ensure that exceedance flows during extreme weather events are managed safely.

4.20. The document ensures compliance with national standards such as the Water Industry Act 1991, Defra's non-statutory technical standards, and other regulatory frameworks. Following this guidance helps developers align with legal obligations, ensuring their drainage systems meet necessary regulatory approvals.

4.21. By adhering to the design principles and providing the necessary documentation, developers can transfer long-term responsibility for drainage systems to sewerage companies, ensuring professional maintenance and reducing the burden on the developer.

Wokingham Borough Council as Local Lead Flood Authority

4.22. As the Local Lead Flood Authority (LLFA), Wokingham Borough Council holds statutory responsibilities under the Flood and Water Management Act 2010, which requires local authorities to manage local flood risk from sources such as surface water, groundwater, and ordinary watercourses (i.e., rivers and streams that are not classified as "main rivers" by the Environment Agency). The LLFA is responsible for creating and implementing strategies that reduce flood risk, improve water management practices, and ensure public safety.

4.23. The key responsibilities of WBC as the LLFA include:

- Flood Risk Management Strategy: WBC must develop a Local Flood Risk Management Strategy (LFRMS) that outlines how flood risk will be managed in the borough, particularly focusing on surface water, groundwater, and ordinary watercourses. The strategy provides a framework for coordinated flood risk management and is supported by data gathered through assessments like the SFRA.
- Surface Water Management: Managing surface water flood risks is a priority in urban areas. This involves assessing potential flood risks from heavy rainfall events and designing appropriate mitigation measures, which are integral to the SFRA's findings.
- Ordinary Watercourses: WBC manages flood risks from smaller rivers and streams, ensuring they are maintained and free from obstructions that could lead to local flooding.
- Flood Incident Investigation: When significant flood events occur, WBC is responsible for investigating the causes and impacts, identifying improvements to flood defences, and making recommendations to reduce future risks.
- Planning Consultations: WBC, as an LLFA, is a statutory consultee for all planning applications that may have flood risk implications. This involves assessing flood risk from development.

Wokingham Borough Council Local Plan Update Policies

4.24. The following draft policies identified within Wokingham Borough Council's "Local Plan Update 2023-2040 Proposed Submission Plan" document dated 2024 are relevant to the evolution of the project.

Policy C4: Green and Blue Infrastructure and Public Rights of Way

4.25. Policy C4 aims to ensure that new development supports and enhances green and blue infrastructure, including natural resources like rivers, streams, woodlands, and public rights of way.

4.26. Developments must contribute to improving biodiversity, flood risk mitigation, and creating recreational spaces. Public rights of way should be preserved and enhanced to improve accessibility for walking, cycling, and other sustainable transport options. Developers are encouraged to integrate green spaces and blue water elements into the design to contribute to ecological networks.

Policy FD2: Sustainable Drainage

4.27. Sustainable drainage systems (SuDS) are essential to managing surface water, especially considering climate change. All developments should incorporate SuDS to mimic natural water flow, returning run-off rates to pre-development levels. For greenfield sites, runoff should match original levels, while brownfield sites should achieve a reduction.

4.28. SuDS should provide ecological, social, and environmental benefits while being designed for long-term functionality. The policy also emphasizes the need for a clear maintenance strategy and a preference for natural drainage solutions over underground tanks.

Policy FD3: River Corridors and Watercourses

4.29. This policy focuses on conserving and enhancing the natural, ecological, and cultural value of river corridors and watercourses. Development proposals near rivers must respect the setting, improve public access, and protect the biodiversity associated with these environments.

4.30. Key principles include maintaining natural banks, preventing negative impacts on water quality, and ensuring that any river or watercourse culverting is avoided when possible. The policy also supports de-culverting where appropriate.

Wokingham SuDS Strategy – Guidance on the use of Sustainable Drainage Systems

4.31. Wokingham Borough Council's 'Guidance on the use of Sustainable Drainage Systems' (SuDS) document dated January 2017 is focused on reducing flood risk, improving water quality, and enhancing biodiversity within the borough. The SuDS Strategy forms a key part of the council's commitment to managing surface water in an environmentally sustainable way, ensuring that new developments are designed to manage rainfall effectively.

4.32. For major planning applications (developments of 10 or more dwellings or equivalent non-residential developments), SuDS are required unless demonstrated to be unsuitable. These systems aim to mimic natural drainage processes, reducing surface water runoff and its associated risks. The strategy provides guidance for developers, ensuring that drainage designs comply with national standards and local requirements, integrating SuDS into the planning process.

4.33. Developers are expected to submit detailed drainage strategies and surface water management plans, which are subject to approval. Wokingham Borough Council also emphasizes early consultation with local authorities, the use of SuDS in line with flood risk policies, and requires robust maintenance plans to ensure the long-term effectiveness of these systems.

Compliance

4.34. The assessment and adherence to National and Local Government, Local Plan Update requirements for integrated sustainable drainage features and comprehensive drainage provision has been instrumental in the development of the LGV Framework Plan.

4.35. The provision of site wide attenuation features, coupled with the desire to provide significant blue-green infrastructure as part of the overall landscaping strategy across the scheme, introduces a myriad of opportunities for ecological, and aesthetic interest alongside the fundamental requirement to accommodate surface water runoff to pre-stipulated greenfield run-off rates.

4.36. The overarching Drainage Strategy can build upon these principles under any future Planning Application to ensure full compliance with Policies, particularly SS13, to provide a robust and technically viable, deliverable scheme.

5.0 Surface Water Drainage Overview

Introduction

5.1. This chapter provides an overview of the proposed surface water drainage strategy, water quality provision and measures to drain the Development.

Overall Strategy

5.2. A proportion of the Site falls within Flood Zones 3a and 3b, indicating a high probability of river flooding, with additional risks from surface water flooding. The site is traversed by several small watercourses and drainage features, exacerbating the flood risk. Surface water flood risk is notably high in some areas, especially during extreme rainfall events.

5.3. Several flood mitigation strategies, including sustainable drainage systems (SuDS), will be implemented to manage the flood risk. These will consider the Site's sensitivity to climate change, which could increase flood extents and severity.

5.4. The Drainage Strategy is evolving to achieve the requirements of NPPF, local plan policies and foresees the provision of a comprehensive Sustainable Drainage System (SuDS) across the development. The utilisation of Sustainable Drainage Systems (SuDS) not only provides the benefit of controlling waters at source and online treatment of collected surface water but also allows enhanced aesthetics through improved landscaping, biodiversity, and ecological opportunities.

5.5. These features offer a holistic treatment train and management system to the benefit of new residents, members of the wider community, downstream receptors, and the environment.

5.6. The selection of the most appropriate SuDS needs to consider existing constraints, ownership, and maintenance issues. To that end, the most suitable SuDS features that could be incorporated into this Site are:

- Attenuation Basins
- Permeable paving
- Swales
- Filter Drains
- Bioretention Systems
- Sub surface storage; and
- Use of existing natural ditches and watercourses.

5.7. The use of infiltration methods of surface water disposal should be embraced where appropriate and deemed technically viable. Factors such as ground permeability and proximity to the existing groundwater Source Protection Zones may have an influence on the positive inclusion of such features.

5.8. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in the catchment, particularly flooding downstream. Changes of land uses can have significant downstream impacts where existing drainage systems may not have sufficient capacity for any additional surface water flow.

5.9. A surface water management strategy is therefore required to manage and reduce the flood risk posed by the surface water runoff from the site. The surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a developed site are no greater than the rates to the pre-development scenario unless specific off-site arrangements are made and result in the same net effect.

5.10. In addition, it is important that:

- The Site's Drainage Strategy will account for future climate change impacts, as increased rainfall intensity could exacerbate flood risks.
- The Drainage Strategy will manage and reduce the flood risk posed by the surface water runoff from the site with the use of multiple SuDS and blue-green corridors.
- All designs will be in accordance with best practice as stipulated in EA Report SC030219 'Rainfall Runoff Management for Developments'. FEH Rainfall data 2022 will be utilised in line with the requirements of CIRIA 753 guidance.
- All conveyance systems will be designed to cater for the 1 in 30-year storm event (3.3% AEP), in accordance with industry standard, with all attenuation features designed to allow for the 1 in 100-year storm event (1% AEP) plus 40% climate change allowance.

5.11. In line with the "Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for Adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code")" guidance, all adoptable sewers will have a minimum diameter of 150mm.

5.12. Implementation of SuDS will ensure that flood risk downstream is not increased due to the proposed development. These features will also provide positive improvements to the quality of surface water runoff.

Pre and Post Development Areas/Rates

5.13. To quantify any potential increase in surface water runoff, the existing Greenfield/Pre-Development runoff rate from the Site must be determined. The rates of runoff have been determined using the current 'industry best practice' guidelines as outlined in the Interim Code of Practice for SuDS.

5.14. An assessment of the existing greenfield surface water runoff has been undertaken, using the online HR Wallingford tool and the existing greenfield runoff rate (QBAR) of the site is 4.4l/s/ha.

5.15. The proposed development will restrict flows to greenfield runoff rates (QBAR), which is 4.4l/s/ha. This negates the requirement for Long Term Storage.

Surface Water Proposals

5.16. It is proposed to provide a network of trapped gullies, pipes, and Sustainable Drainage (SuDS) features to collect the surface water runoff from impermeable areas such as roads, roofs and, driveways. The traditional system will work in combination with such features as permeable paving, filter drains, roadside swales, and basins to provide attenuation storage and high-quality water benefits. Refer to **Appendix A** for the preliminary drainage strategy of the proposed development.

5.17. The proposed development will mimic and reflect existing topographical falls in accordance with The SuDS Manual (C753). Therefore, the entire site will be split in several catchments. There will be some localised reprofiling of ground levels to facilitate the development parcels, albeit, this will not be of significance to change the overall hydrological catchment direction.

5.18. Each catchment will benefit from its own principal attenuation basin and outfall point into nearby ditches and watercourses.

5.19. The SuDS basins will be designed in accordance with the SuDS Manual C753 in respect to maximum gradients and water depths. This allows landscaping of both wetland and wildflower mixes to provide an appropriate landscape context in the vicinity of the features through the provision of an aquatic shelf.

5.20. Open SuDS features will be designed so as not to compromise the safety of residents, visitors, and their property. Generally open boundaries are provided, and perimeter planting could be utilised to define the extents of the features.

5.21. Proposed discharge rates will be restricted to QBAR for all storm events up to and including the 1 in 100-year storm event plus 40% allowance for climate change and this will be achieved by utilising on-site flow control devices such as a Hydrobrakes.

5.22. All conveyance systems will be designed to cater for the 1 in 30-year storm event, in accordance with industry standard, with all attenuation features designed to allow for the 1 in 100-year storm event plus 40% climate change allowance.

5.23. The design of the conveyance features such as swales and filter drains will be in accordance with CIRIA C753 The SuDS Manual and will form part of the proposed blue-green corridors.

5.24. With development being located within areas of the Site where flood risk from pluvial or fluvial sources are low, future occupants and the public will be afforded safe access and egress at all times.

Water Quality

5.25. Water quality is an essential component of environmental management, especially in urban and developed areas where human activities contribute to pollution. Untreated runoff from impermeable surfaces, such as roads, rooftops, and industrial sites, can carry various contaminants, including heavy metals, oils, nutrients, and sediments, into natural water bodies, affecting ecosystems and human health. The concern over deteriorating water quality has grown in parallel with the rise in urbanization and industrial activities. Thus, the integration of effective drainage systems plays a crucial role in mitigating water pollution. Sustainable Drainage Systems (SuDS), outlined comprehensively in the SuDS Manual C753, offer an approach that not only manages flood risks but also improves water quality through natural processes.

5.26. SuDS utilise a variety of components that mimic natural hydrological processes to manage surface water. Each component plays a role in improving water quality through various mechanisms, such as sediment capture, filtration, biological uptake, and infiltration.

5.27. The SuDS Manual C753 emphasizes the importance of water quality management and outlines specific processes by which SuDS components achieve pollutant removal. These processes include:

- **Sedimentation:** The removal of suspended solids from runoff as water slows down, allowing particles to settle. This process occurs in features such as swales, ponds, and sedimentation basins. By capturing sediments, these systems prevent the transport of heavy metals and other attached pollutants to watercourses.
- **Filtration:** Physical filtering of runoff through soil or a permeable medium. Permeable pavements, filter strips, and vegetated systems like swales and wetlands provide filtration, removing fine particles and associated contaminants.
- **Adsorption:** Pollutants adhere to surfaces of soil particles, vegetation, or other materials. This process is particularly effective for removing metals and hydrocarbons. Vegetated SuDS components, such as swales and wetlands, play a significant role in pollutant adsorption.
- **Biodegradation:** Microbial processes break down organic pollutants, such as oils and hydrocarbons, in the soil or on plant surfaces. Biodegradation occurs in systems with high biological activity, including wetlands and infiltration systems. It is a critical process for treating pollutants that cannot be removed through physical means.
- **Uptake by Vegetation:** Plants in SuDS systems can take up nutrients, such as nitrogen and phosphorus, from runoff. This process is important for reducing nutrient loading, which can lead to eutrophication in receiving water bodies. Wetlands and vegetated swales are particularly effective at nutrient uptake.

5.28. The SuDS Manual C753 provides detailed guidance on designing, implementing, and maintaining SuDS to maximize their benefits for water quality. Some of the key recommendations include:

- **Treatment Train Approach:** The SuDS Manual advocates for a "treatment train" approach, where multiple SuDS components are used in sequence to progressively improve water quality. For example, runoff from a road might first pass through a filter strip to remove coarse

sediment, then a swale for additional filtration and infiltration, and finally a pond or wetland for biological treatment and attenuation.

- **Designing for Pollutant Removal**: SuDS should be designed to target specific pollutants based on the characteristics of the site and the type of runoff. For instance, areas with significant vehicular traffic may require systems that effectively remove hydrocarbons and heavy metals, while areas with high nutrient loads may benefit from wetlands or bio-retention systems that target phosphorus and nitrogen removal.
- **Maintenance and Monitoring:** Effective water quality management through SuDS requires ongoing maintenance to ensure that systems function as designed. Sediment build-up, clogging of infiltration surfaces, and degradation of vegetation can reduce the efficiency of SuDS over time. Regular monitoring is essential to assess performance and guide maintenance activities.
- **Community and Ecological Benefits**: SuDS should not be viewed solely as engineering solutions. Their integration into landscapes can provide broader ecological and social benefits. For example, ponds and wetlands can support biodiversity, while green spaces enhance the aesthetic and recreational value of urban developments.

5.29. The SuDS Manual C753 outlines the methodology for assessing water quality risks associated with new development. This is a simple index approach which provides a high-level scoping analysis of the land usage and gives guidelines for appropriate treatment stages.

5.30. The Sustainable Drainage Systems (SuDS) features incorporated in this Drainage Strategy will provide significant pollution mitigation. Furthermore, the integration of blue-green corridors and treatment trains will effectively reduce further or eliminate the pollution levels specified in the SuDS Manual (C753), enhancing overall water quality, and promoting environmental sustainability.

5.31. The surface water treatment train will not only capable of catering for 'typical' pollution occurrences emanating from the development such as sediment or dissolved metals, but also provides mitigation for 'untypical' pollution such as fire water or hydrocarbon spills.

Exceedance Flood Routing

5.32. Exceedance flood routes are an essential aspect of flood risk management in the UK, where increasing urbanisation and changing weather patterns have heightened the risk of surface water flooding. These routes serve as overflow pathways for water when drainage systems exceed their design capacity, often due to heavy rainfall or storms. By strategically directing floodwaters away from vulnerable areas like homes and infrastructure, exceedance flood routes help mitigate damage and reduce the risk to human life.

5.33. In the UK, the increasing frequency and intensity of heavy rainfall events are being driven by climate change, which poses significant challenges to drainage systems, especially in urban areas. Many UK drainage networks were designed decades ago to handle less severe weather conditions, typically managing rain events with a return period of 1 in 30 years. However, with rainfall patterns now exceeding these thresholds, there is a growing need for effective exceedance flood routing as part of flood resilience planning.

5.34. The Environment Agency and local authorities across the UK have integrated exceedance routes into urban planning policies to manage surface water flooding more effectively. These routes are critical in urban areas, where impermeable surfaces like roads and pavements prevent natural infiltration, leading to higher volumes of runoff.

5.35. Exceedance routes are often designed in conjunction with other flood mitigation strategies, such as Sustainable Urban Drainage Systems (SuDS), to create a holistic approach to flood risk management. Key elements of exceedance flood routes include:

- **Natural Topography Utilization:** In the UK, local topography often provides natural pathways for water flow. These natural channels, such as valleys, streams, or slopes, are incorporated into flood risk management strategies to direct water away from built-up areas.
- **Urban Design Features:** Streets, pavements, and car parks are designed to act as temporary flood routes in the event of drainage system exceedance. Roads can channel water to lower-risk areas, such as parks or retention basins, away from homes and critical infrastructure.
- **Flow Barriers and Raised Structures:** In areas prone to flooding, the UK's Building Regulations and flood risk guidelines often require the Finished Floor Levels (FFLs) of buildings to be set higher than the surrounding ground level. Setting FFLs well above anticipated flood levels—typically 150mm or more above the surrounding ground or the predicted flood level—is a key strategy in reducing the risk of water ingress into buildings. This measure ensures that even during exceedance events, where surface water accumulates, buildings remain protected.
- **SuDS Integration:** SuDS such as permeable paving, detention ponds, swales, and green roofs are implemented across new developments in the UK to manage surface water runoff at the source. These systems slow down the flow of water, allowing it to infiltrate the ground gradually, or temporarily store it in designated areas, thus reducing the pressure on conventional drainage systems during heavy rain events.

5.36. As part of the Drainage Strategy, flows in excess of the above design storms, which may flood from the network for storms in excess of the 1 in 100-year storm plus 40% climate change, will be kept within the internal road network, until such time as they can be directed into adjacent landscaping areas or existing vegetation/woodland. This ensures that no onsite or offsite residential units are afforded an increased level of protection from flood waters until such time as the rain events become significant.

5.37. Finished Floor Levels (FFLs) play a critical role in managing flood risks, especially in areas where exceedance flood routes are necessary. By setting FFLs high—often above predicted flood levels—the risk of water entering buildings during a flood event is minimized. The Environment Agency typically recommends that FFLs be set at least 300mm above the known flood level for residential properties, though this can vary based on local conditions. This precaution ensures that, even during exceedance flood events, where water may flow down streets or around buildings, it does not enter homes or businesses.

5.38. The proposed attenuation basins of the Development are designed to provide 300mm freeboard and therefore can accept additional flood water from manholes upstream.

Adoption and Ownership

5.39. The drainage system will be designed to the appropriate standards including the new Sewerage Sector Guidance (SSG), the Building Regulations and the requirement of the National Planning Policy Framework.

5.40. The intention of adoption and ownership of drainage and SuDS is as follows:

- Surface water sewers within development parcels to be offered for adoption to Thames Water or NAV under the Section 104 process of the Water Industry Act.
- Surface water highway drains, gullies and leads within adopted roads to be maintained by the Highway Authority.
- Above ground attenuation (i.e. swales and basins) to be maintained by a NAV or a private maintenance company funded by residential properties or subject to agreement with the Local Authority.
- SuDS features serving single properties, for example, permeable paved driveways to single dwellings, will be owned and maintained by the owner of that property.

6.0 Foul Water Drainage Overview

Introduction

6.1. This chapter provides an overview of the proposed foul water drainage strategy and measures to convey effluent.

Overall Strategy

6.2. Due to the topography of the Site and location of the existing foul sewer points of connection, wastewater from the Site cannot flow entirely by gravity to the receiving public sewers. Where required, foul pumping stations will be introduced in order to convey effluent from within the Site to external points of disposal.

6.3. Thames Water determines capacity and a suitable point of practical connection to the public sewerage through their Pre-Planning Enquiry process. This includes a high-level internal hydraulic analysis to establish if the development can be accommodated within its sewer network and sewage treatment works, whilst still within their allowable discharge and treatment rates.

6.4. This initial Pre-Planning Enquiry to Thames Water has established inadequate sewer capacity within the immediate vicinity, and inadequate sewage treatment at the nearby Arborfield Water Recycling Centre (WRC), which will receive the bulk of the effluent from the proposals east of the River Loddon.

6.5. Effluent generated by Thames Valley Science Park (TVSP) will be conveyed north of the M4 motorway to Marsh Farm Sewage Pumping Station (SPS) via existing sewers, and therein to Wargrave WRC.

6.6. Discussions are ongoing with Thames Water regarding the extent of additional off-site sewers or improvements to existing sewers that will be required to provide sufficient capacity to service the development. Thames Water envisage the promotion of a direct connection to the existing WRC located to the south-east of the proposed site, wherein effluent will be directed.

6.7. Since April 2018, upgrades are funded by Thames Water through their New Infrastructure Charging mechanism or, in the case of large development projects such as this, through Business Plan/Asset Management Plan (AMP) funding where strategic infrastructure is required. Should network capacity improvements be required, certainty of delivery is therefore guaranteed as the reliance on the Developer to facilitate upgrades is removed.

6.8. Thames Water has a legal obligation under Section 94 of the Water Industry Act to provide developers with the right to connect to a public sewer regardless of capacity issues. Similarly, under Section 94, Thames Water has a statutory duty to plan and implement any works that area necessary to ensure the network of sewers and sewage treatment facilities continue to operate.

6.9. Thames Water has advised that sewage treatment upgrades are already proposed under AMP7 (2020 to 2025), and further works are proposed under AMP8 (2025-2030).

6.10. New onsite pumping stations will be required within the development alongside new sewer provisions beneath the internal road network to reflect early phases and/or specific parcel delivery, either of which is possible.

6.11. The proposed foul water sewers will be designed in collaboration with Thames Water as approving body in accordance with the new Sewerage Sector Guidance (SSG) and will be offered to Thames Water or NAV for adoption under S104 Agreements of the Water Industry Act.

Adoption and Ownership

6.12. The drainage system is designed to the appropriate standards including the new Sewerage Sector Guidance (SSG), the Building Regulations and British Standards.

6.13. Foul water sewers within development parcels and offsite to the point of connections are to be offered for adoption to Thames Water/NAV under the Section 104 process of the Water Industry Act.

7.0 Summary

7.1. Through the collection of significant survey data and site observations, baseline assessments have proven that the Site relies heavily on its natural watercourses and drainage networks, which direct water towards the River Loddon and Barkham Brook.

7.2. Parts of the Site, particularly to the west of the River Loddon are prone to fluvial and/or surface water flooding and, whilst there will be no residential development in these areas, it is a consideration in the development of the Drainage Strategy.

7.3. In areas prone to surface water flow and flooding, retention of natural drainage flow paths and integration with blue-green infrastructure is critical. Future development will maintain pre-development surface water greenfield runoff rates, ensuring no increased flood risk either on or off-site.

7.4. Therefore, future proposals will restrict flows to greenfield runoff rates (QBAR), which is 4.4l/s/ha.

7.5. Sustainable Drainage Systems (SuDS) are an essential tool for managing surface water in a sustainable and resilient manner. The SuDS Manual C753 provides comprehensive guidance on how to design, implement, and maintain SuDS to achieve the best possible outcomes for flood risk management, water quality improvement, amenity, and biodiversity. By integrating SuDS into urban developments and retrofitting them into existing infrastructure, communities can reap the many environmental, social, and economic benefits of sustainable water management.

7.6. The overarching Drainage Strategy will manage the flood risk posed by uncontrolled surface water runoff from the Site. Any increase in surface water run-off can be managed using SuDS source control techniques as well as attenuation features to provide storage in extreme storm events.

7.7. Flows in excess of the above design storms, which may flood from the network for storms in excess of the 1 in 100-year storm plus 40% climate change, will be kept within the internal road network, until such time as they can be directed into adjacent landscaping areas or existing vegetation/woodland. This ensures that no onsite or offsite residential units are afforded an increased level of protection from flood waters until such time as the rain events become significant.

7.8. All conveyance systems will be designed to cater for the 1 in 30-year storm event (3.3% AEP), in accordance with industry standard, with all attenuation features designed to allow for the 1 in 100 year storm event (1% AEP) plus 40% climate change allowance.

7.9. The design of the conveyance features will be in accordance with CIRIA C753 The SuDS Manual and will form part of the proposed blue-green corridors.

7.10. Onsite foul pumping station, and sewers will be designed in collaboration with Thames Water/NAV as approving body in accordance with the new Sewerage Sector Guidance (SSG) and will be offered for adoption under S104 Agreements of the Water Industry Act.

7.11. With development being located within areas of the Site where flood risk from pluvial or fluvial sources are low, future occupants and the public will be afforded safe access and egress at all times.

7.12. Through careful assessment and development of the preliminary Drainage Strategy, a technically compliant scheme is deliverable and can be brought forward through future Planning Applications.

7.13. Such a Drainage Strategy wholeheartedly embraces the principles set out under Policy SS13 and Appendix C of the Local Plan Update.

Appendices

Appendix A - Plan

Preliminary Drainage Strategy

Parcel Ref	Total Area (m2)	Total Area (ha)	Impermeable Area based on the 65% of the Total Area(ha)	Allowable discharge rate (l/s)	Design Rate (l/s)	Storage Estimate Provided (m3) (1 in 5 side slopes)
1	35,431.208	3.543	2.303	10.1	10.1	**2,405**
2	43,853.367	4.385	2.850	12.5	12.5	**2,778**
3 (3a, 3b, 3c)	233,281.314	23.328	15.163	66.7	66.7	**14,091**
4a	97,168.624	9.717	6.316	27.8	27.8	**5,612**
4c	21,517.972	2.152	1.399	6.2	6.2	**1,285**
5	133,537.293	13.354	8.680	38.2	38.2	**7,926**
6a	141,240.445	14.124	9.181	40.4	40.4	**8,528**
6b	67,649.965	6.765	4.397	19.3	19.3	**3,969**
5	41,781.214	4.178	2.716	11.9	11.9	**2,684**
5	64,429.457	6.443	4.188	18.4	18.4	**4,296**
5	10,113.900	1.011	0.657	2.9	2.9	**841**
5	7,620.966	0.762	0.495	2.2	2.2	**533**
10	24,513.400	2.451	1.593	7.0	7.0	**1,486**
11+12 Combined	30,071.730	3.007	1.955	8.6	8.6	**7,926**
5	24,871.668	2.487	1.617	7.1	7.1	**1,585**
Total		**114.904**	**74.687**	**272.3**	**272.3**	**59,855**

Calculations from Ardent Consulting Engineers

Parcel Ref	Total Area (m2)	Impermeable Area (60% with 10% urban creep) (ha)	Design Rate (l/s)	Attenuation Estimate Required (m^3)
13	64,688.833	1.280	8.5	787
14	48,151.308	11.460	76.3	7339
15	29,040.754	2.560	17.0	1595

Attenuation Basins 13, 14 and 15 were designed by Ardent Consulting Engineers

Attenuation Basin to cater for Parcels 11 and part of 12

Sports Pitches to use their own standalone drainage system based on filter drains and to discharge to the nearby watercourse.

GENERAL NOTES:

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in millimetres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

KEY:

- Anticipated Fluvial Flood Zone 2 and 3 extent
- Existing Pluvial Flood extent
- Proposed Development Parcel
- Proposed Attenuation Basin
- Existing Woodland
- Existing Watercourse

PARCEL CONFIGURATION BASED UPON SAVILLS PUBLIC OPEN SPACE STRATEGY OPTION 3B DATED 15.03.2024

Rev	Date	Description	Drawn	Checked
P6	10/24	UPDATED TO REFLECT PARCEL 12	GR	LPA
P5	09/24	UPDATED TO ADDRESS PARCEL 11	GR	LPA
P4	05/24	UPDATED TO REFLECT REDUCED BASIN SIZES	GR	LPA
P3	04/24	UPDATED IN LINE WITH SAVILLS MASTERPLAN	GR	LPA
P2	11/23	UPDATED IN LINE WITH GLEESON MASTERPLAN	KLW	LPA
P1	06/22	FIRST ISSUE	KLW	LPA

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Project: LODDON GARDEN VILLAGE

Title: HALL FARM
SURFACE WATER STRATEGY

Status: FOR INFORMATION

Scale	Date	Drawn	Checked
NTS @ A1	JUNE 2022	KLW	LPA

Drawing No: A392-024

Revision: P6

ABLEY LETCHFORD PARTNERSHIP
Consulting Engineers

LODDON GARDEN VILLAGE, SHINFIELD
REGULATION 19 CONSULTATION
FLOOD RISK TECHNICAL REPORT

UNIVERSITY OF READING

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Contents

Appendices

1.0 Introduction

Context

1.1. This Technical Report has been prepared by Abley Letchford Partnership Ltd (ALP), on behalf of the University of Reading, to support Wokingham Borough Council's (WBC) Local Plan Update (LPU) Regulation 19 consultation, in particular in relation to the proposed allocation of the Loddon Garden Village (LGV) via Policy SS13.

1.2. A comprehensive review of flood risk data and modelling has been undertaken to inform the site-wide approach for flood management for LGV. This will support the Place Shaping, Landscaping, Green/Blue Infrastructure Principles stipulated within the Policy SS13 text.

1.3. Specifically, under Drainage Flood Alleviation in part 7 of the Policy, it will:

''….devise and implement a comprehensive drainage and flood alleviation strategy that:

a) Provides high quality sustainable drainage systems (SuDS) that are integrated into the wider landscape and green and blue infrastructure strategy, including mitigation at source and makes a positive contribution to attractive open spaces, and improvement to biodiversity and water quality;

b) Considers and takes opportunity as appropriate to improve the management of flood risk and reduce the risk of flooding to areas beyond the garden village; and

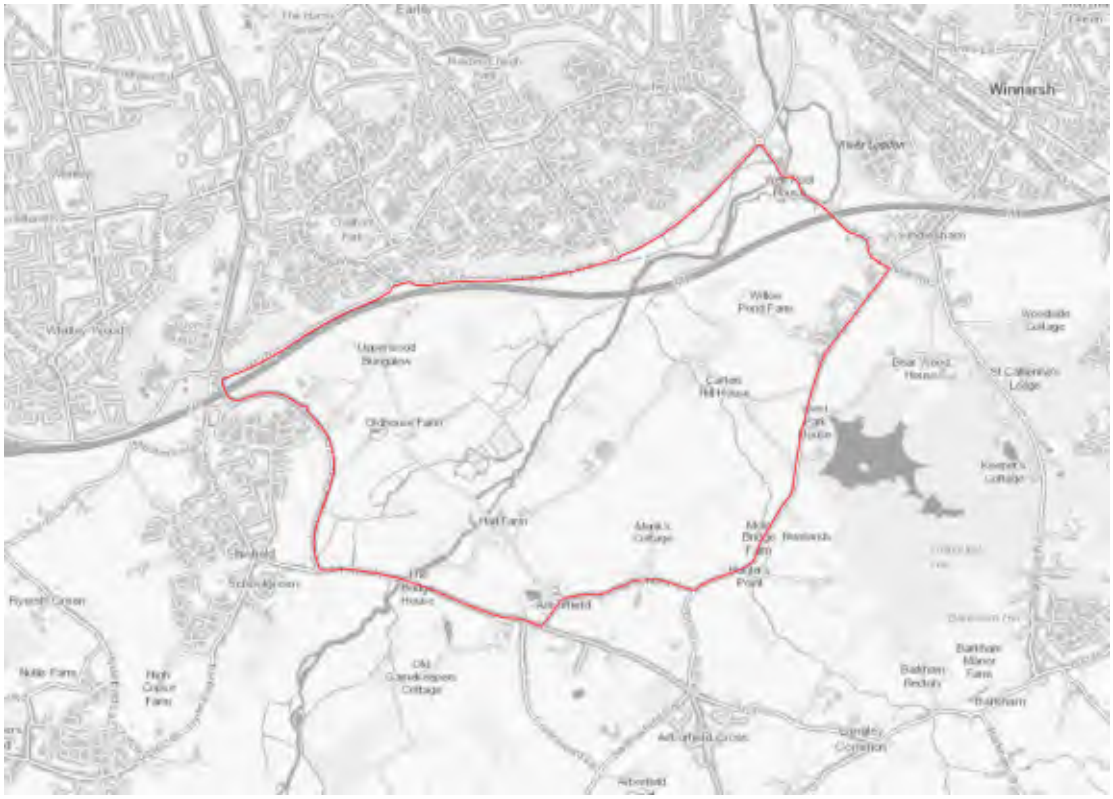
c) Establishes clear and robust arrangements for future maintenance.''

1.4. Through adherence to key place making principles set out within the Development Guidelines contained within Appendix C of the Local Plan Update, the flood management strategy will support the creation of a sustainable, safe, well designed, attractive community, which is able to respond to potential changes associated with climate change and flood risk.

Site Location and Development Proposals

1.5. The LGV is located in Shinfield parish, Arborfield & Newland parish and Earley parish, to the south of Reading. The site spans the River Loddon in Berkshire and the site centre grid reference is 475,750E, 168,650N.. The site centre grid reference is 475,750E, 168,650N. The site location is shown in **Figure 1**.

Figure 1 - Site location plan



1.6. The site consists predominantly of large agricultural fields, enclosed by hedgerows and tree boundaries. There are some farm and research buildings within the site boundary.

Structure of this Report

1.7. This Report is structured as follows:

- Section 2: Consultation and Engagement
- Section 3: National and Local Requirements/Compliance
- Section 4: Site Analysis/Baseline Condition
- Section 5: Flood Management Overview
- Section 6: Summary

2.0 Consultation and Engagement

Introduction

2.1. This chapter sets out consultation and engagement with key stakeholders.

Environment Agency (EA)

2.2. The Environment Agency (EA) is the lead organisation for providing flood and coastal risk management and warnings of flooding from main rivers and on the coast. Its role includes providing evidence and advice to support others. This includes national flood and coastal erosion risk information, data and tools to help other Risk Management Authorities and inform Government policy, and advice on planning and development issues.

2.3. The Council's Duty to Cooperate: Interim Statement of Compliance, Sept 2024, confirms that the EA has been working closely with Wokingham Borough Council in the completion of the Level 1 and Level 2 Strategic Flood Risk Assessments (SFRA), 2023, and has provided comments throughout the plan making process including for the Regulation 18 'Revised Growth Strategy' consultation (Nov 2021-Jan 2022). Comments have been used by the Council to finalise the documents.

2.4. It also confirms that a MoU has been established between Wokingham Borough Council and the EA to ensure effective engagement.

Wokingham Borough Council

2.5. Wokingham Borough Council as the Lead Local Flooding Authority (LLFA) have responsibilities under the Flood and Water Management Act and powers under the Land Drainage Act 1991 to regulate ordinary watercourses (outside of internal drainage districts). In practice, the LLFA has a role to manage local flood risk from sources such as surface water, groundwater, and ordinary watercourses (i.e., rivers and streams that are not classified as "main rivers" by the Environment Agency). It determines consents for any works to ordinary watercourses and has specific requirements with regards to maintaining flow in such watercourses.

2.6. As part of the Local Plan Update, discussion has been entered into with the Council, specifically with Flood Risk, Drainage, Landscape and Ecology Officers.

2.7. The Project Team have taken account of feedback received from the Council to refine the strategy for the management of flood risk within the LGV development.

2.8. The Project Team will continue to work with the Council and the EA as the proposals for the LGV are developed.

3.0 National and Local Requirements/Compliance

Introduction

3.1. This chapter provides a review of National and Local policy relevant to the proposals and provides confirmation of compliance.

National Planning Policy Framework (NPPF)

3.2. The National Planning Policy Framework (NPPF, 2023) provides key policies for the assessment of flood risk and consideration of it as part of new developments and in strategic plan making.

3.3. National planning policy in relation to Flood Risk is set out in Section 14 of the NPPF and Planning Practice Guidance (PPG) ID: 7 for Flood Risk and Coastal Change. Flood Risk is discussed in Paragraphs 165-175 of the NPPF.

3.4. Paragraphs 165-168 discuss the sequential approach. Paragraph 166 refers to a Strategic Flood Risk Assessment (SFRA) that would form the basis of applying the Sequential Test for local authorities to allocate development, whilst Paragraphs 169-170 relate to the Exception Test.

3.5. Paragraph 167 discusses the requirements of the sequential approach at the plan making stage stating:

All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

a) applying the sequential test and then, if necessary, the exception test as set out below;

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations

3.6. The NPPF confirms in paragraph 168 that the SFRA will be the basis for applying the sequential test. Paragraph 169 goes on to state:

If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.

3.7. Paragraph 170 of NPPF sets out the requirements of the Exception Test, applicable at both plan and application stage*:*

The application of the exception test should be informed by a strategic or site specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

3.8. Subsequent planning applications for allocated sites need not apply the sequential test again, but the exception test may need to be reapplied.

Wokingham Borough Council Planning Policy: Local Plan Update 2024

3.9. The following policies from the Local Plan Update are relevant to flood risk assessment and consideration of flooding within the development strategy.

Policy FD1: Development and Flood Risk (from all sources)

3.10. Policy FD1 sets out how development proposals need to account for all sources of flood risk at all stages in the planning process in line with national policy and the Strategic Flood Risk Assessment (SFRA).

3.11. The policy goes on to confirm when the Sequential Test is applicable, the requirements of the Exception Test and the requirements for a site specific FRA, with these consistent with NPPF.

3.12. The supporting text confirms that for allocated sites the Sequential Test does not need to be applied again, but the Exception Test may be required.

Policy FD3: River Corridors and Watercourses

3.13. This policy focuses on conserving and enhancing the natural, ecological, and cultural value of river corridors and watercourses. Development proposals near rivers must respect the setting, improve public access, and protect the biodiversity associated with these environments.

3.14. Key principles include maintaining natural banks, preventing negative impacts on water quality, and ensuring that any river or watercourse culverting is avoided when possible. The policy also supports de-culverting where appropriate.

Policy SS13: Loddon Valley Garden Village

3.15. This policy sets out development, place shaping and delivery principles for the LGV.

3.16. Place shaping principles guide the siting, layout and form of the LGV including that it should:

'Locate new buildings except those for water compatible uses, outside areas of flood risk, with development planned for sequentially, by placing the most vulnerable development in the lowest areas of flood risk'.

3.17. Under the Delivery principles is a section on Drainage and flood alleviation which states:

'Development proposals should devise and implement a comprehensive drainage and flood alleviation strategy that:

a) Provides high quality sustainable drainage systems (SuDS) that are integrated into the wider landscape and green and blue infrastructure strategy, including mitigation at source and makes a positive contribution to attractive open spaces, and improvement to biodiversity and water quality;

b) Considers and takes opportunity as appropriate to improve the management of flood risk and reduce the risk of flooding to areas beyond the garden village; and

c) Establishes clear and robust arrangements for future maintenance.

3.18. The policy also sets out that that an integral element of the garden village is a country park along the River Loddon and there is a focus on delivering blue/green infrastructure, such that the development embraces its riverside location and valuable water environment.

Compliance

3.19. Adherence to National policy and Local Plan Update requirements for assessing and managing flood risk has been instrumental in the development of the emerging LGV Framework Masterplan.

3.20. The overarching strategy for flood management can build upon these principles under any future Planning Application in order to ensure full compliance with Policies, particularly SS13, to provide a robust and technically viable, deliverable scheme.

4.0 Site Analysis/Baseline Flood Risk

General

4.1. The Site is located in Wokingham Borough, and it is primarily a greenfield site with some brownfield areas. Ground levels slope generally to the north with the Loddon valley running through the centre of the site.

4.2. The River Loddon flows through the site in a north-easterly direction, passing under Arborfield Road at the site's southern boundary and under the M4 close to its northern boundary. A key tributary of the Loddon is the Barkham Brook which flows from the site's south-eastern boundary, through the site and into the Loddon just upstream of the M4. A network of smaller watercourses feed into the Loddon from the west and into the Loddon and Barkham Brook from the south-east.

Flood Risk from all Sources

Sources of Data

4.3. Key sources of flood data include the EA on line mapping at gov.uk as well as the council's Level 1 and Level 2 SFRAs which are provided within the councils Local Plan Update evidence documents:

- Wokingham Borough Council Local Plan Update, Level 2 Strategic Flood Risk Assessment, Nov 2021 (Stantec)
- Wokingham Borough Council Level 1 Strategic Flood Risk Assessment, May 2023 (JBA)
- Wokingham Borough Council Level 2 Strategic Flood Risk Assessment, August 2023 (JBA)

4.4. The SFRAs were completed recently and, it is noted that the flood mapping for fluvial, surface water, reservoir flood risk and for historic flooding appears to be the same in the Level 1 and 2 SFRA dated 2023 as for the on line EA mapping. It is also noted that the Level 2 SFRA dated 2021 uses a different model to inform the flood mapping for fluvial flood risk from the River Loddon and this shows a different floodplain extent.

4.5. Data from the Level 1 and 2 SFRAs has been used to assess potential flood risk at the site and this is summarised in the following sections. The Level 2 SFRA dated 2023 assesses sites for allocation in the Local Plan Update and includes a detailed site summary for the LGV site and this is also summarised later in this section.

Fluvial Flood Risk

4.6. The River Loddon flows through the site with an extensive network of tributaries on both the western and eastern banks. The most significant tributary is the Barkham Brook which flows from the south-eastern boundary and joins the Loddon upstream of the M4. Frequent, and sometimes prolonged, flooding is experienced in some parts of the site, primarily to the west of the Loddon.

4.7. The EA and Wokingham Borough Council have completed detailed modelling of the River Loddon and its key tributaries.

4.8. Fluvial flood mapping from the Level 1 and 2 SFRAs dated 2023 is reproduced in **Appendix 1**. This is based on results derived from a model originally created in 2007 and for which the hydrology has been updated. Mapping in the Level 2 SFRA dated 2021, and which informed the Regulation 18 process, uses results derived from a model which was produced at that time and which includes representation of key local physical features within or on the edge of the floodplain such as the eastern relief road at Shinfield.

4.9. The 2023 mapping confirms that approximately one third of the site is potentially affected by flooding in events up to the 1 in 1,000 year flood event, which is defined as Flood Zone 2 in NPPF; much of this area is also shown to be functional floodplain and within Flood Zone 3. However, it is notable that within the LGV area flooding from the River Loddon is almost entirely in the areas to the west of the Loddon. The eastern Loddon floodplain is fairly constrained along the river corridor except for the areas closest to the M4. There are areas of 'dry islands' within the floodplain to the west of the Loddon representing higher ground surrounded by floodplain. The M4 presents a barrier to floodplain flow although there are a number of culverts through the motorway embankment as well as the opening for the main channel.

4.10. The mapping from the 2021 SFRA shows the floodplain to be less extensive in all modelled scenarios including the functional floodplain, Flood Zone 3b. This mapping is reproduced in **Appendix 1**. It confirms that the floodplain is most significant to the west of the Loddon.

4.11. The Barkham Brook flows north-west through the LGV area east of the Loddon and there is a floodplain associated with this watercourse. The floodplain is primarily constrained within the watercourse corridor from the eastern end although it does widen downstream of Carters Hill House and towards the confluence with the Loddon.

Surface Water Flood Risk

4.12. Mapping of the potential surface water flooding extent from the Level 2 SFRA dated 2023 is reproduced in **Appendix 1**.

4.13. The mapping confirms that the Loddon corridor and the Barkham Brook corridor areas are most prone to surface water flooding. There are also significant areas to the west of the Loddon where the smaller tributaries may convey surface water and low lying areas where it may become ponded. Generally these areas are less extensive than the fluvial floodplain. The most notable exceptions are the smaller watercourses both to the west of the Loddon and towards the M4 north of Shinfield as well as the smaller watercourses to the east of the Loddon feeding into the Barkham Brook and also through Arborfield.

4.14. EA mapping of the risk of surface water flooding is strategic in nature and does not include details of key structures, channels and other features that would affect the actual potential for surface water flooding. With this in mind, this potential flood risk from these smaller watercourses has been assessed further as part of detailed modelling studies to inform the LGV development. These studies include detailed survey of the smaller watercourses and current ground model data.

Reservoir Flood Risk

4.15. Various reservoirs are located within the catchments of the River Loddon and the Barkham Brook, including the Bearwood Lake located just beyond the LGV's eastern boundary.

4.16. EA mapping in the Level 2 SFRA dated 2023 shows the potential extent of reservoir flooding in both dry day and wet days scenarios. The 'dry-day' scenario predicts the flooding that would occur if the dam or reservoir failed when rivers are at normal levels. The 'wet day' scenario predicts how much worse the flooding might be if a river is already experiencing an extreme natural flood. The mapping is reproduced in **Appendix 1**.

4.17. In the dry day the potential risk along the Loddon is significantly less extensive than the fluvial Flood Zones 2 and 3; however along the Barkham Brook the potential flooding is shown to be more significant due to its proximity to the Bearwood Lake. The potential flood extent is up to about 100m wide along the brook.

4.18. In the wet day modelling the extent of flooding to the west of the Loddon is more extensive than even the fluvial Flood Zone 2 floodplain and with the dry islands inundated. Along the Barkham Brook it is generally the same as the dry day scenario.

Groundwater Flood Risk

4.19. The Level 1 SFRA, 2023, includes mapping of the risk of groundwater flooding showing areas susceptible to groundwater flooding based on geological and hydrogeological conditions; it shows the potential degree of hazard (indicating that flooding may be possible) but does not indicate the actual likelihood of groundwater flooding occurring (risk of flooding).

4.20. This suggests that there is a potential for groundwater flooding particularly along the Loddon corridor, although the data is coarse and limited to 1km grid squares. As such it is useful as an indicator but not for determining actual risk.

4.21. The Level 1 and 2 SFRAs, 2023, show mapping of predicted groundwater depths which is used as an indicator for the risk of groundwater flooding.

4.22. This suggests that groundwater is at a shallow depth in an area to the west of the Loddon and between 0.5m and 5m below the surface in specific areas south of the M4 and an area near Oldhouse Farm to the west of the Loddon.

4.23. The mapping from both datasets is reproduced in **Appendix 1**.

Flood Risk from Sewers

4.24. The Level 1 and 2 SFRAs, 2023, confirm that there have been reports of sewer flooding within the bounds of the site, primarily along Mole Road and Arborfield Road, with clusters of flooding identified by Thames Water in the Arborfield STW catchment.

4.25. It is also noted that Thames Water will be reviewing and upgrading the existing sewer network to manage the additional flows generated by the LGV development and other local developments.

Wokingham Borough Council Level 2 SFRA, Aug 2023: Detailed Site Summary

4.26. As part of the Level 2 SFRA, 2023, the council undertook a detailed assessment of the LGV site. This included a review of all sources of flooding and commentary on the requirements for a FRA to support development of the site.

4.27. This summary concluded that the NPPF Sequential Test will need to be applied by the council, and, if passed, the Exception Test would need to be satisfied as part of the development proposals. It is also noted that 'More Vulnerable' and 'Less Vulnerable' uses should not be permitted within Flood Zone 3b, the functional floodplain.

4.28. It states that a FRA for the site must satisfy the following criteria:

- *At the planning application stage, a site-specific FRA will be required as the proposed development site is located in Flood Zone 3a and Flood Zone 3b, and in at significant surface water flood risk.*
- *All sources of flooding should be considered as part of a site-specific FRA.*
- *Consultation with the Local Authority, Lead Local Flood Authority, Water Company, and the Environment Agency should be undertaken at an early stage.*
- *Any FRA should be carried out in line with the National Planning Policy Framework (NPPF); Flood Risk and Coastal Change Planning Practice Guidance (PPG); Wokingham Borough Council's Local Plan Policy's and Wokingham Borough Council's SuDS Strategy.*
- *The development should be designed with mitigation measures in place where required.*
- *A detailed hydraulic model of Barkham Brook may be required at FRA stage to accurately represent the risk from these watercourses.*

4.29. And guidance for site design and making development safe includes the following:

- *The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).*
- *The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates are as close as possible to pre-development greenfield rates.*
- *Arrangements for safe access and egress will need to be provided for the 1% AEP fluvial and rainfall events with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate measures, so development and occupants are safe.*

- *Provisions for safe access and egress should not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.*
- *Flood resilience and resistance measures should be implemented where appropriate during the construction phase, e.g. raising of floor levels and use of boundary walls. These measures should be assessed to make sure that flooding is not increased elsewhere.*
- *Opportunities should be explored at the earliest possible stage to reduce flood risk (from all sources) on and off the site*

Wokingham Borough Council Sequential Test and Exception Test, Sept 2024

4.30. As noted above, the site is or is potentially affected by flooding from various sources, and therefore any proposed development needs to pass the Sequential Test. The council has completed the Sequential Sites for allocated sites as part of the Local Plan Update, 2024 and this includes the LGV site.

4.31. The Sequential Test confirms the level of flood risk from different sources across the site and identifies the areas where a sequential approach to development may be appropriate. In Table 3a (pages 104-105) it confirms the key findings of the Level 2 SFRA that development on site is likely to be able to proceed if:

- *The area of the site located in Flood Zone 3a and 3b, immediately surrounding the River Loddon and Barkham Brook remains undeveloped.*
- *Development is steered away from surface water flow paths, particularly towards the south and south-west of the site. A carefully considered and integrated flood resilient and sustainable drainage design is put forward, to carefully consider, manage and mitigate existing flood risk both to and from the site.*
- *Safe access and egress can be demonstrated in the 1% AEP plus climate change surface water and fluvial events. This includes measures to reduce flood risk along these routes such as raising access, but not displacing floodwater elsewhere. At present, safe access and egress cannot be demonstrated in the 1% AEP plus 40% climate change surface water event. Additionally, safe access and egress can only be demonstrated in the 1% AEP plus 23% climate change fluvial event when accessing the site from the north via Shinfield Eastern Relief Road, and from the South via Mole Road.*
- *A site-specific FRA demonstrates that the site is not at an increased risk of flooding in the future and that development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties.*
- *If flood mitigation measures are implemented then they are tested to check that they will not displace water elsewhere (for example, if land is raised to permit development on one area, compensatory flood storage will be required in another).*

4.32. The development guidelines proposed in the LPU for the LGV are set out (Table 3a pages 105 to 106) as:

- *To ensure new buildings (except for compatible uses) are located, wherever possible, outside of areas of higher flood risk, by placing the most vulnerable development in the lowest areas of flood risk.*
- *Create a continuous high-quality, safe, attractive, accessible and multifunctional green and blue infrastructure network designed and planned in from the outset. The new garden village will be structured around a coordinated and comprehensive landscape-led approach drawing on the recreational and ecological opportunities of the River Loddon and Barkham Brook and their tributaries by utilising their role and function in natural flood management and biodiversity enhancement; and the landscape attributes and characteristics of the River Loddon Valued Landscape and Barkham and Bearwood Valued Landscape. Accessibility to and along watercourses should be increased as part of the provision of continuous, high-quality and attractive and accessible open space and ecological networks, where possible, linking to those beyond the garden village.*
- *Address the potential changes associated with climate change and flood risk, providing safe access and egress, taking account potential increases in severity and frequency of flooding, and ensure buildings and homes are designed to be safe for the intended lifetime. A comprehensive and integrated site-wide sustainable drainage network must be provided that makes use of the existing topography and natural features of the site. All opportunities should be further explored to achieve flood betterment, reducing risk within and beyond the garden village.*

4.33. The conclusion is that the development passes the Sequential Test:

- *The development passes the sequential test for allocation because there is a need to identify a sufficient supply of dwellings and employment floorspace to meet needs. In line with the preferred spatial strategy, a strategic site is required to help meet development needs.*
- *Given the scale of the site, a significant area of land is located within FZ1 and areas with low risk of flooding, and this area is capable of accommodating the proposed quantum of development. The Proposed-Submission LPU requires development to both reduce and minimise flood risk on site; in particular by sequentially locating development within the site. There are also opportunities to manage flood risk at the site, and provide localised betterment downstream.*

4.34. The Exception Test is required for the development and this will be completed as part of a FRA for the proposed development.

Summary of Baseline Flood Risk

4.35. Parts of the site, particularly to the west of the Loddon are known to be affected by flooding from the Loddon and the site is potentially affected by other sources of flooding. Modelling of fluvial and surface water flooding has been completed across the site either by the EA and the council or as part of studies to inform the development and is generally well understood.

4.36. Thus, a sequential approach can be taken to masterplanning for the LGV with development focussed in areas of Flood Zone 1 and with Essential Infrastructure, Less Vulnerable and Water Compatible uses in areas of potential flooding. Within the floodplain areas the development strategy will embrace the opportunities for enhancing biodiversity, amenity value and access routes along the river corridor.

4.37. Detailed modelling will be completed to support the final proposals and inform design. Opportunities for providing measures within LGV to provide some level of flood alleviation elsewhere will also be tested through modelling.

5.0 Flood Management Strategy Overview

Introduction

5.1. This chapter provides an overview of the proposed flood management strategy for the Development and how this meets the requirements set out in the LPU SFRAs and Sequential Test.

Sequential Approach

5.2. The sequential approach is a masterplanning tool where the least vulnerable uses are located within the areas of potential flooding and more vulnerable uses, such as residential development, are located in areas with low flood risk.

5.3. Overall, approximately one third of the site may be affected by flooding from various sources. Where appropriate, the EA's and council's strategic mapping is being supplemented by a site specific and detailed assessment of flooding. The proposed development strategy within areas assessed to have significant flood risk is limited to amenity uses and essential infrastructure.

5.4. The development strategy is informed by the council's 2021 modelling. Residential development and other built development for the LGV will be largely focussed in the area to the east of the Loddon which is located beyond the modelled floodplains of the Loddon and Barkham Brook. The TVSP expansion is located to the west of the River Loddon but outside the floodplain of the Loddon.

Proposed Works within Floodplain and/or Watercourses

5.5. Generally built development will be located outside the floodplain and designed to respect and retain existing watercourses. However, some development will be necessary within the floodplain to provide essential infrastructure such as crossings of the Loddon, Barkham Brook or other watercourses. and any associated earthworks.

5.6. For the proposed road crossing of the River Loddon, which is a Main River, key design principles have been agreed with the EA including the height of the bridge soffit above the modelled flood level (including an allowance for climate change) and how far the open span section of the bridge needs to extend beyond the river banks.

5.7. Detailed modelling, will be completed as part of the FRA to confirm the impact of any proposed crossings and associated earthworks as well as any other proposed works within the floodplain of the River Loddon and Barkham Brook.

5.8. Preliminary modelling of the proposed Loddon crossing, using the council's model as the baseline, indicates that there is no detrimental impact on flooding beyond the LGV site boundaries and the impact of the crossing on flood levels is restricted to the area upstream of the crossing on the western bank of the Loddon and within the area already indicated to be in Flood Zone 2.

Floodplain Storage and Conveyance

5.9. As noted above there will be some proposed works within the floodplain. In these cases the impact of the proposed works will be fully assessed and, where necessary compensation will be provided.

5.10. The Loddon floodplain provides both storage of water during a flood and a conveyance route for water along the floodplain. Where floodplain storage has been lost due to the proposed works, this will be compensated to ensure that the function of the floodplain is not compromised. Where conveyance is impacted this will be mitigated through the provision of alternative flow routes such as flood relief culverts through road embankments.

Detailed Modelling

5.11. The EA and council have confirmed that the current models of the Loddon and Arborfield area are sufficiently robust to inform policy and strategy decisions i.e. robust to underpin the SFRA. For site specific FRAs they have advised that an alternative model could be used to inform future planning applications following validation by the Environment Agency.

5.12. Detailed modelling of both fluvial and surface water flooding will be undertaken as appropriate to fully assess the site, inform the proposed design and confirm any impacts of the proposed development and mitigation measures. This will include modelling of the Barkham Brook as suggested by the SFRA.

5.13. The detailed modelling will include analysis of the relevant climate change scenarios using the current data and guidance from the EA.

Opportunities for Flood Alleviation Benefits

5.14. With works to the River Loddon and its corridor, there may be impacts on the hydrological and flooding regime beyond the site. In accordance with NPPF, the development must not make flooding worse elsewhere; however there is a possibility that works at the site could reduce the extent or frequency of flooding in some locations in some scenarios.

5.15. Such opportunities will be investigated through modelling and also to consider any wider impacts beyond flooding, such as to sensitive habitats, to ensure there are no unintended adverse consequences.

5.16. By virtue of the provision of a surface water drainage strategy for the proposed development, there will be reductions in the flows into the Loddon and its tributaries in various scenarios, therefore a beneficial impact downstream.

6.0 Summary

6.1. The River Loddon is the central feature of the LGV site and a focus for amenity, biodiversity and landscape opportunities. However it is also a source of flooding particularly for the western part of the site. Along with flooding from the Barkham Brook and smaller watercourses and from other sources of flooding, the potential risk to the site is well understood from EA and council modelling studies. This has informed masterplanning and overall concept for the LGV development.

6.2. Further detailed modelling will inform the detailed design for specific elements of the proposed development which may impact the watercourses and/or floodplain.

6.3. Overall the proposed development will be designed to ensure safety from flooding for the residents through the completion of a detailed FRA including strategies for access and mitigation where needed. There will be no adverse impact off site and opportunities for providing flood alleviation as part of the development will be considered and assessed.

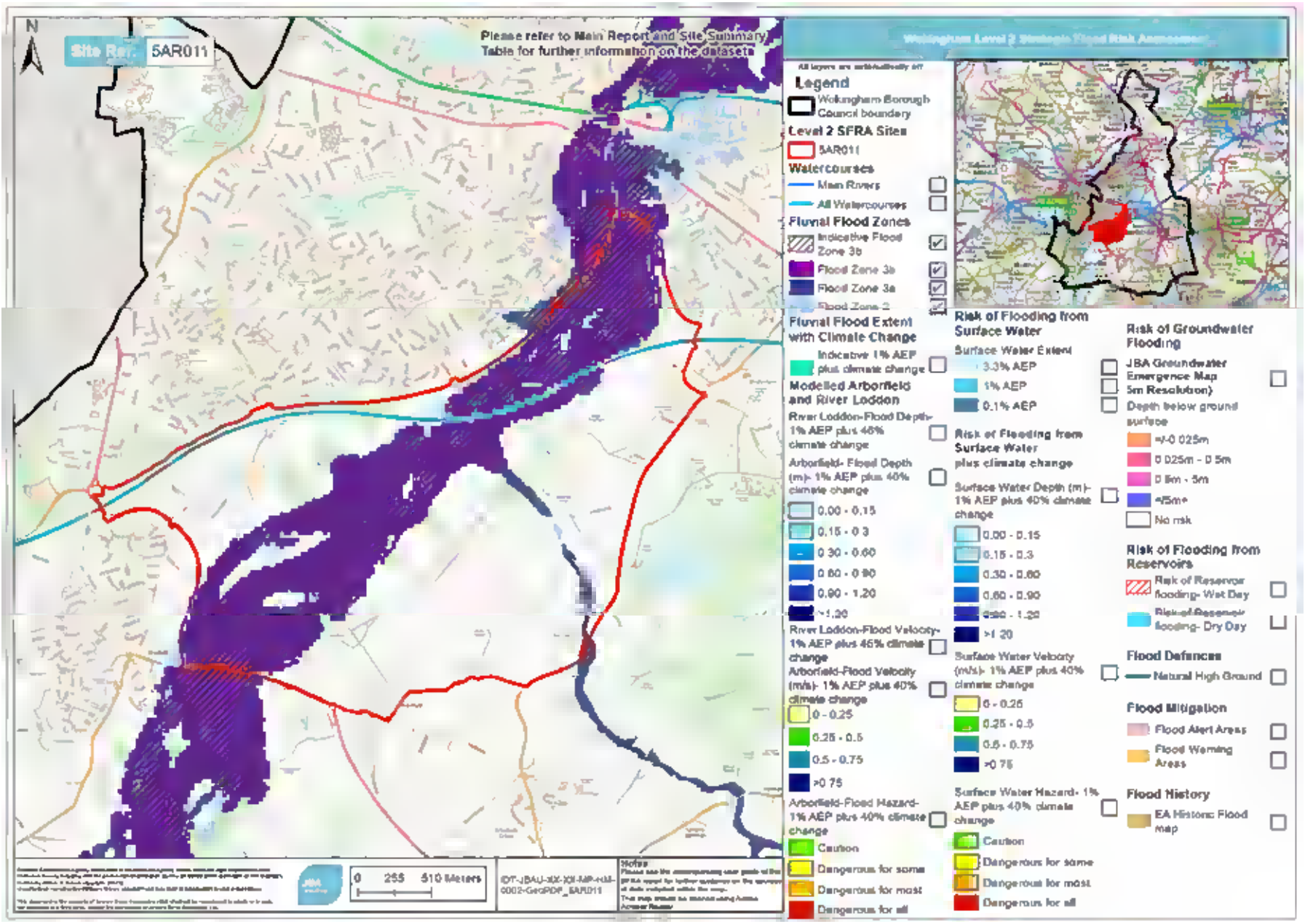
6.4. Such a development strategy wholeheartedly embraces the principles set out under Policy SS13 and Appendix C of the Local Plan Update as well as the requirements set out in the Level 2 SFRA. Furthermore, the relevant provisions within the NPPF including the Sequential Test and Exception Test will be met.

Appendices

Appendix A - Plans

Baseline Flood Risk Mapping:

- Level 2 SFRA, 2023, Fluvial Flood Zones
- Level 2 SFRA, 2021, Present Day Flood Zones
- Level 2 SFRA, 2023, Risk of Flooding from Surface Water
- Level 1 SFRA, 2023, Risk of Groundwater Flooding
- Level 2 SFRA, 2023, Risk of Groundwater Flooding: JBA Groundwater Emergence Map
- Level 2 SFRA, 2023, Risk of Flooding from Reservoirs


N
Site Ref: SAR011
Please refer to Main Report and Site Summary Table for further information on the dataset
Legend
Wokingham Borough Council boundary
Level 2 SFRA Sites
SAR011
Watercourses
Main Rivers
All Watercourses
Fluvial Flood Zones
Indicative Flood Zone 3b
Flood Zone 3b
Flood Zone 3a
Flood Zone 2
Fluvial Flood Extent with Climate Change
Indicative 1% AEP plus climate change
Modelled Arborfield and River Loddon
River Loddon-Flood Depth- 1% AEP plus 40% climate change
Arborfield- Flood Depth (m)- 1% AEP plus 40% climate change
0.00 - 0.15
0.15 - 0.3
0.30 - 0.60
0.60 - 0.90
0.90 - 1.20
>1.20
River Loddon-Flood Velocity- 1% AEP plus 40% climate change
Arborfield-Flood Velocity (m/s)- 1% AEP plus 40% climate change
0 - 0.25
0.25 - 0.5
0.5 - 0.75
>0.75
Arborfield-Flood Hazard- 1% AEP plus 40% climate change
Caution
Dangerous for some
Dangerous for most
Dangerous for all
Risk of Flooding from Surface Water
Surface Water Extent
3.3% AEP
1% AEP
0.1% AEP
Risk of Flooding from Surface Water plus climate change
Surface Water Depth (m)- 1% AEP plus 40% climate change
0.00 - 0.15
0.15 - 0.3
0.30 - 0.60
0.60 - 0.90
0.90 - 1.20
>1.20
Surface Water Velocity (m/s)- 1% AEP plus 40% climate change
0 - 0.25
0.25 - 0.5
0.5 - 0.75
>0.75
Surface Water Hazard- 1% AEP plus 40% climate change
Caution
Dangerous for some
Dangerous for most
Dangerous for all
Risk of Groundwater Flooding
JBA Groundwater Emergence Map (5m Resolution)
Depth below ground surface
<0.025m
0.025m - 0.5m
0.5m - 5m
>5m
No risk
Risk of Flooding from Reservoirs
Risk of Reservoir flooding- Wet Day
Risk of Reservoir flooding- Dry Day
Flood Defences
Natural High Ground
Flood Mitigation
Flood Alert Areas
Flood Warning Areas
Flood History
EA Historic Flood map
0 255 510 Meters

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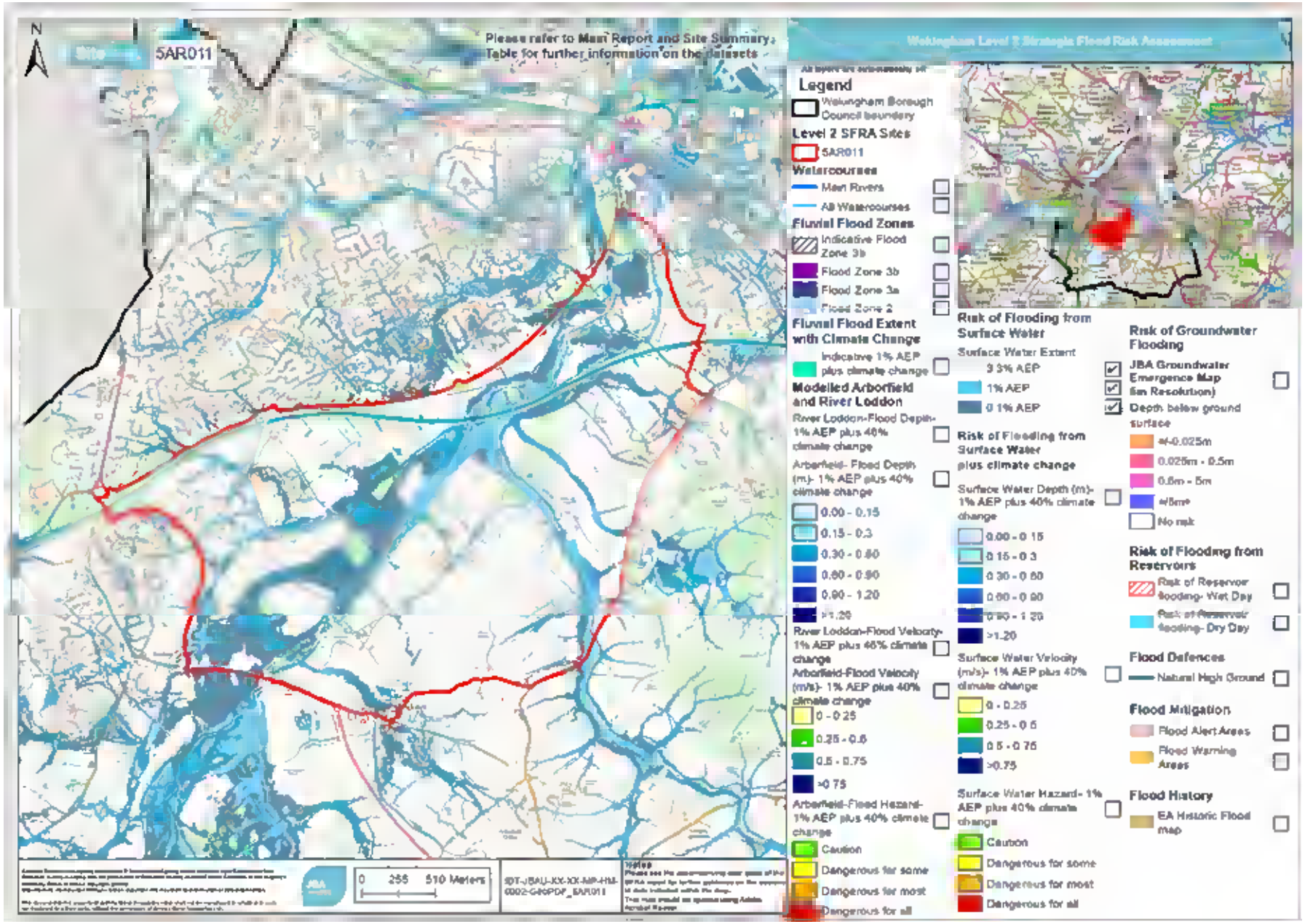
WOKINGHAM

WOKINGHAM LEVEL 2 SFRA

Present Day Flood Zones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Main Rivers
All Watercourses
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Dangerous for most
Dangerous for all
Risk of Groundwater Flooding
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Depth below ground surface
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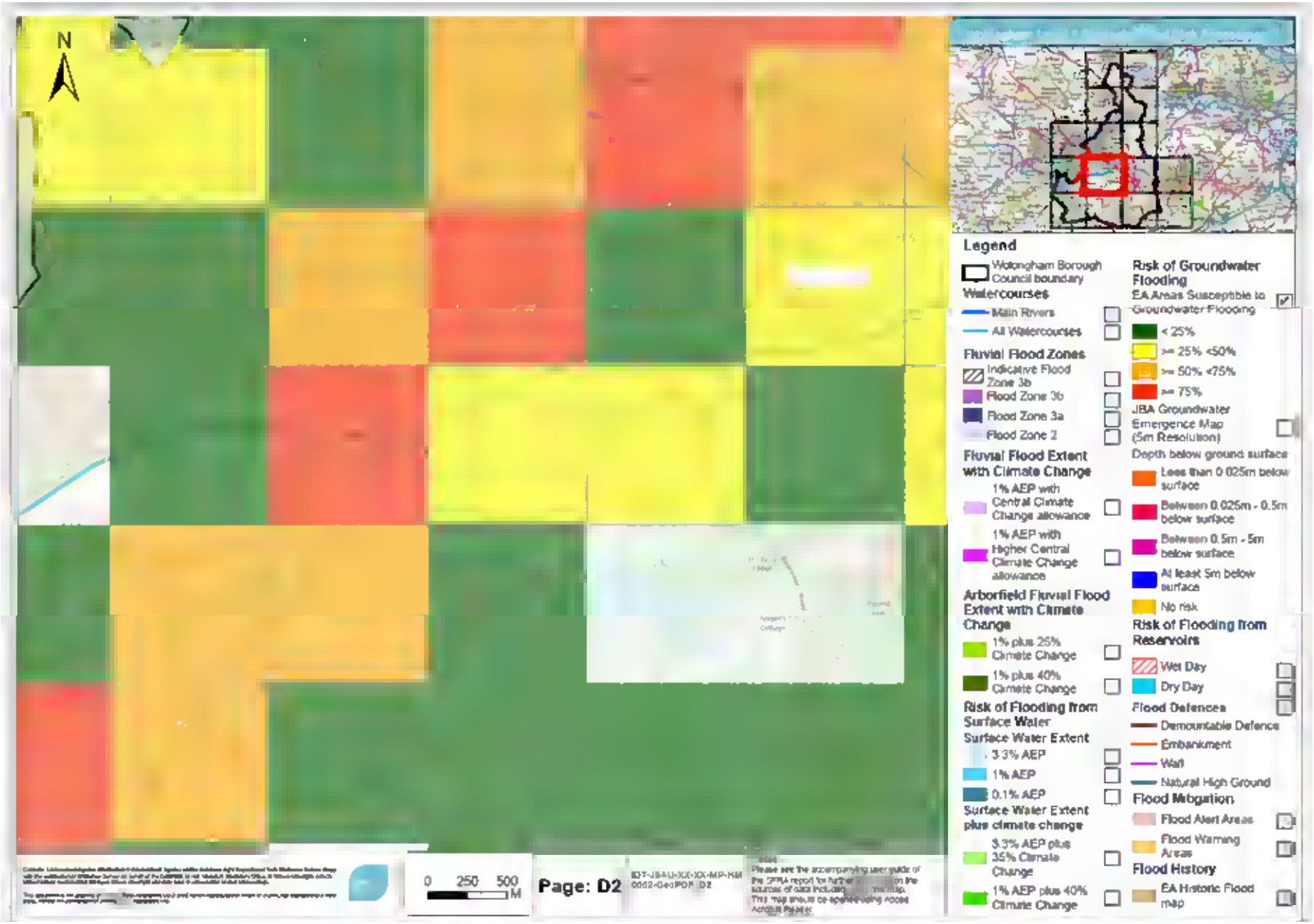
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Flood Zone 3a
Flood Zone 2
Fluvial Flood Extent with Climate Change
1% AEP with Central Climate Change allowance
1% AEP with Higher Central Climate Change allowance
Arborfield Fluvial Flood Extent with Climate Change
1% plus 25% Climate Change
1% plus 40% Climate Change
Risk of Flooding from Surface Water
Surface Water Extent
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1% AEP
0.1% AEP
Surface Water Extent plus climate change
3.3% AEP plus 35% Climate Change
1% AEP plus 40% Climate Change
Risk of Groundwater Flooding
EA Areas Susceptible to Groundwater Flooding
< 25%
>= 25% <50%
>= 50% <75%
>= 75%
JBA Groundwater Emergence Map (5m Resolution)
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Between 0.025m - 0.5m below surface
Between 0.5m - 5m below surface
At least 5m below surface
No risk
Risk of Flooding from Reservoirs
Wet Day
Dry Day
Flood Defences
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Flood Alert Areas
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EA Historic Flood map
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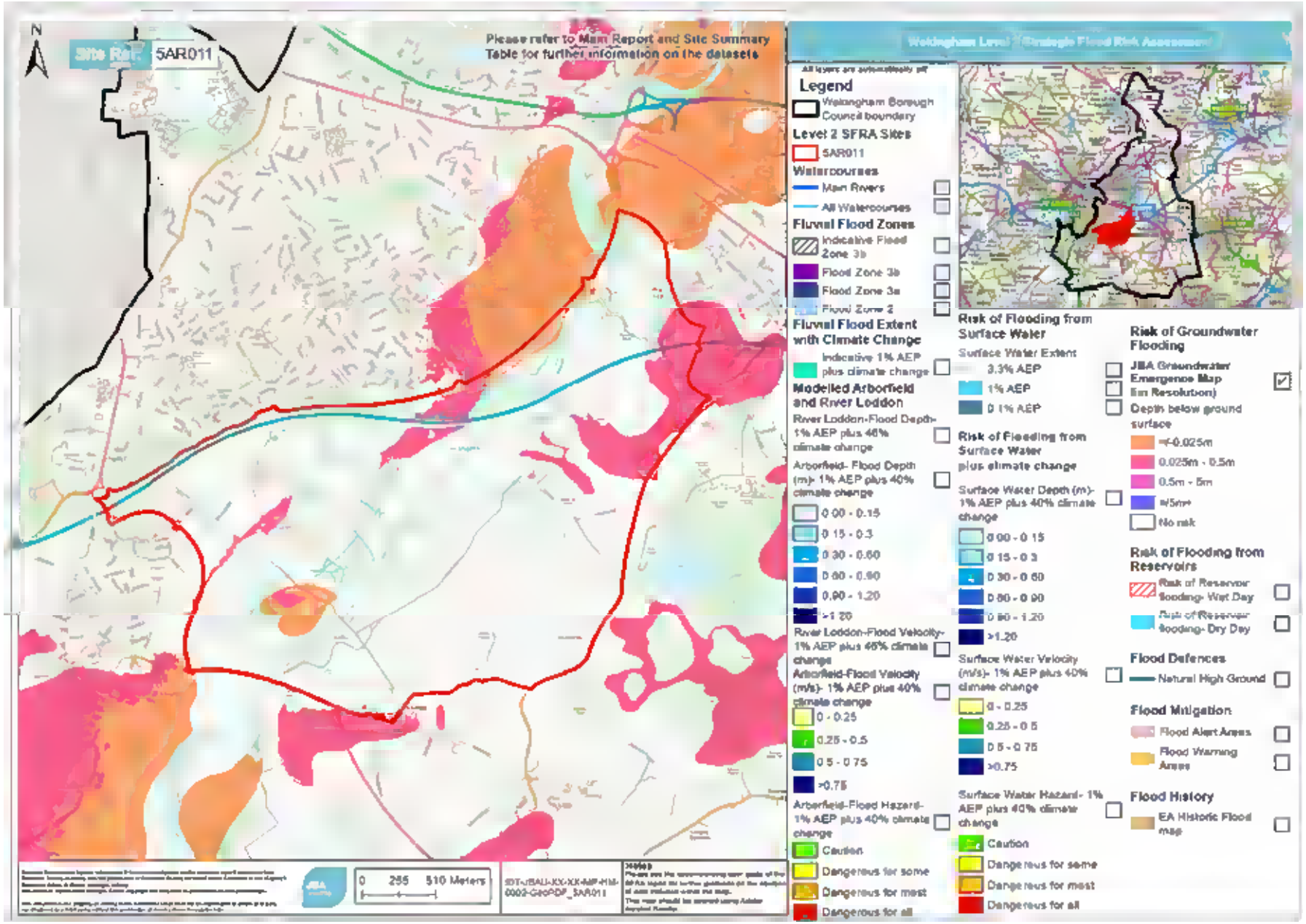
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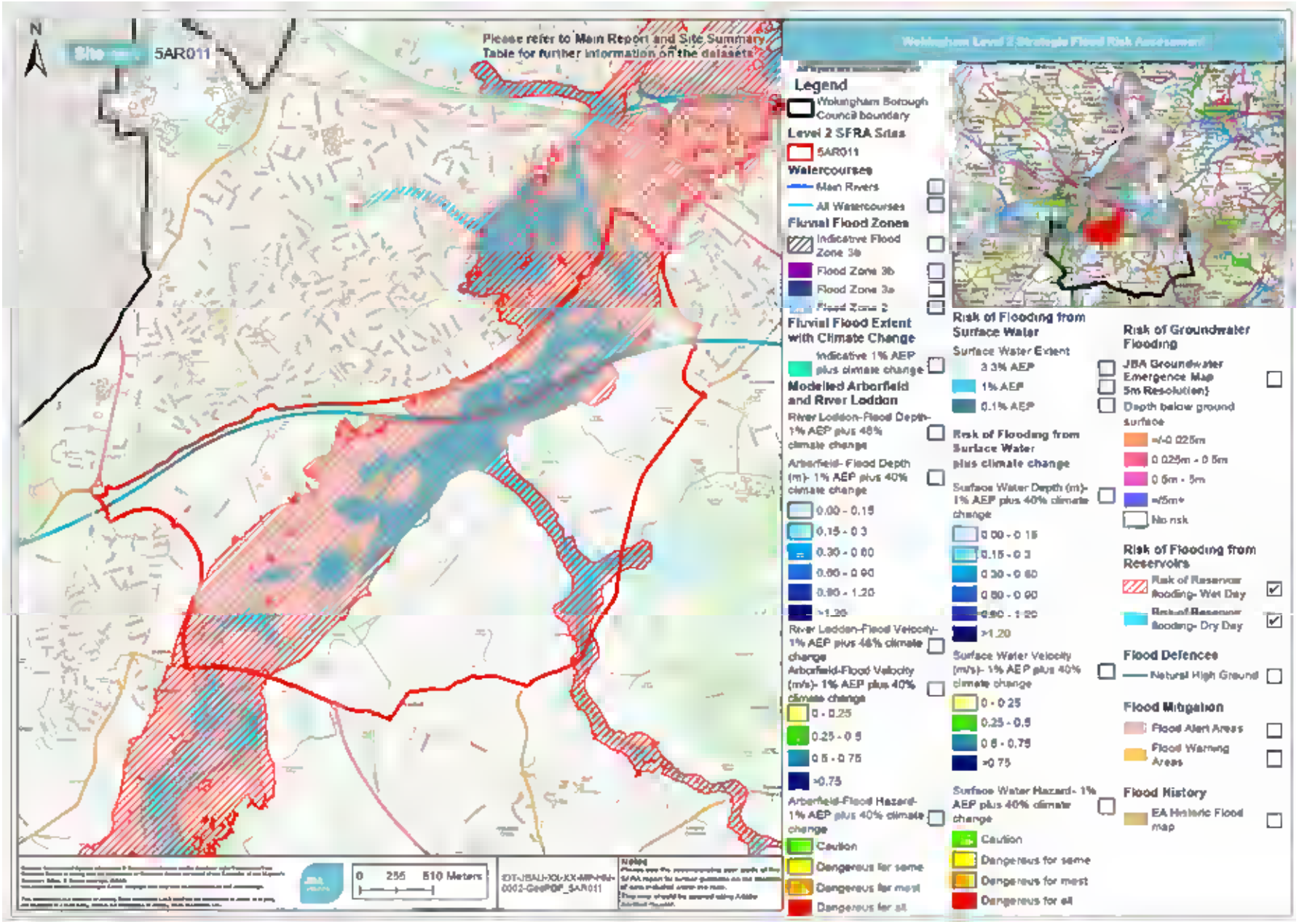
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Risk of Groundwater Flooding
JBA Groundwater Emergence Map 5m Resolution)
Depth below ground surface
=/-0.025m
0.025m - 0.5m
0.5m - 5m
=/5m+
No risk
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Flood Warning Areas
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0 255 510 Meters
Notes

NORTOFT
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University of Reading

Loddon Garden Village

Sports Facilities Technical Report

November 2024

David O'Neil, MRTPI, Sue O'Neil MRTPI, Nortoft Partnerships Limited
Company Registered in England No. 03903741 VAT No. 747791777

Contents

Tables and figures

Appendix

1. Introduction

1.1. This document supports representations on behalf of the University of Reading ('the University') in response to Wokingham Borough Council (WBC's) Regulation 19 pre-submission consultation on the Local Plan Update (LPU), focusing on Policy SS13 which allocates the Loddon Valley Garden Village (LGV). It should be read as part of a suite of documents submitted on behalf of the University in November 2024 including policy representations, Vision Document, and other technical reports.

1.2. It is a high-level summary of the community sport proposals for LGV at a preliminary stage, i.e. prior to the formal Environmental Impact Assessment (EIA), consultation and planning application stages. It considers the community sports facilities demand generated by the proposed allocation at LGV, and how this demand can be met, either on-site or off-site.

1.3. It takes into account: the emerging policies contained in the Wokingham BC Proposed Submission Plan 2023-2040, including the size of the allocation given in draft policy SS13 of around 3,930 dwellings, giving an estimated population at an average of 2.4 persons per dwelling of 9,432 people, and; the draft Infrastructure Delivery Plan (IDP). In relation to community sports, the evidence base documents will be the Playing Pitch Strategy (PPS) and the Indoor Built Facilities Strategy (IBFS), however, both are still to be published by WBC, although the draft PPS has been shared with the LGV team.

1.4. The objective of Wokingham Borough Council's draft policies is to achieve the provision of a secondary school in LGV which is designed for, and can operate as, a shared school/ dual use sports hub. The shared/dual use sports facilities may include:

- 4-court sports hall designed to the community standard.
- Two 3G artificial grass pitches (AGP) full size, fenced and sports lit, and designed to meet the specifications of the Football Association's (FA) 3G AGP Pitch Register.
- A single large area of grass playing field, large enough for both the secondary school's educational requirements and the community's needs.
- A multi-use games area with porous macadam suitable for tennis and netball. If this is a shared facility, it will require sports lighting for evening use.
- Shared changing spaces, with both dedicated 3G AGP and dedicated outdoor changing rooms, potentially as part of an extended sports hall building.
- Appropriate community accessible car and cycle parking.

1.5. The sports hub will need to be serviced by a social area, reception and small office, but these would not also be used by the school.

1.6. This report demonstrates how the LGV allocation proposals are able to deliver the WBC policy objectives.

2. Relevant policies and evidence base

2.1. The emerging policies of relevance to community sport and the shared/dual use proposals for a sports hub at LGV are considered below.

SS13 – Loddon Valley Garden Village

Development principles
Phased delivery of:
a) Around 3,930 dwellings…

c) Schools, including:
i. Two 3-form entry primary schools (including appropriate onsite early years provision); and
ii. An 8-form entry secondary school, with additional land reserved to enable expansion to 12-form entry with sixth form.

Place shaping principles
3. The siting, layout, and form of development, including landscaping should:
…
c) … The promotion of community facilities for shared use, such as outdoor and indoor sports and leisure provision will be strongly encouraged;

2.2. This LGV sports assessment report is based on the long term development generated sports demand of 3,930 dwellings, with a population of approximately 9,432 people.

2.3. The proposals for the sports hub are in accordance with the objective of SS13 for the shared use of indoor and outdoor sports facilities.

2.4. The area of grass playing field at the sports hub will need to provide both community grass pitch space and the area of playing field which will be required for a 12FE secondary school with sixth form, as set down by the Dept for Education's *Area guidelines for mainstream schools, Building Bulletin 103 [2014]* (BB103). This report provides the calculation of the grass pitch space needed for the community use, with the education focused report providing the area which will be required for the school use.

2.5. It is noted that whilst WBC's thoughts on the timing of the secondary school from an education point of view are currently unclear, the inclusion of shared community facilities means the timing/phasing for these facilities is also relevant. The IDP states a 1,500 dwelling trigger of the sports hall which is potentially "dual use", and the Outdoor Sports hub (also potentially "dual use") is "Timing to be agreed".

2.6. It is recognized that the success of the shared use of the sports facilities between the school and community will require:

- Suitable masterplanning and layout of the site to facilitate both education and community use.
- Suitable facility specifications.
- Agreement on phasing and delivery by all parties.
- A legally binding Community Use Agreement which is in in accordance with the Sport England guidance, for the lifetime of the sports facilities.

HC2 – Community Infrastructure

<u>New Facilities</u>

1. *Development proposals for the provision of new or extended community facilities will be supported where there is an identified present or future need, and should be:*

a) Of a suitable nature and scale to meet identified needs, be compatible with the character of the area and be sufficiently flexible to meet changing needs over time;

b) Designed to accommodate a range of community uses, where appropriate. The colocation of facilities, including access for appropriate organisations and the local community will be strongly encouraged;

c) Accessible by the community and promote social inclusion; and

d) Provided as part of a large residential schemes where development increases demand beyond current capacity, or generates a newly arising need.

2. New community facilities must be supported by appropriate arrangements to secure the future management and maintenance of the facility.

2.7. The LGV scheme will provide a new community sports hub which is easily accessible to everyone. The proposals respond to what is directly required to meet the needs of the new population, both for indoor and outdoor sports, where there is not already sufficient provision within an acceptable travel time. The provision of a second artificial turf pitch (3G AGP), which is over and above the needs of the new community at LGV will help to meet a Borough-wide shortfall of this type of facility, as identified in the draft Playing Pitch Strategy.

2.8. The HC2 draft policy also encourages the colocation of facilities, which the shared/dual use sports hub will deliver.

HC4 – Open space, sports, recreation and play facilities

…

New Facilities and Residential Development

1. Development proposals for open space, sport and recreation and play facilities will be encouraged and supported, in line with other policies in the Local Plan Update and Sport England guidance. New open space, sports, recreation and play facilities should be well related to the communities they serve and should, where possible, promote their dual use by being co-located with other community uses, such as schools.

2. Development proposals for residential development involving a net increase in the number of dwellings, will be required to provide or contribute to the provision of open space, sport and recreation and play facilities and must demonstrate how they meet the standards in the table below.

Type (Outdoor sports)	Borough standard (ha per 1,000 population)
Outdoor sports facilities	1.44

Type (indoor sports)	Borough standard (m^2 per 1,000 population)
Sports hall (4-badminton court) including indoor bowls (2 rinks) and Health & Fitness gyms (20 stations)	65.43
Swimming pool	8.26
Activity halls	41.31

5. Open space, sports, recreation and play facilities should be provided on-site. Where this is not possible or achievable, a financial contribution will be sought towards off-site provision.

2.9. LGV is proposing to provide grass pitch space including two 3G AGPs, a 4-court sports hall, and sports-lit multi-use games area, together with appropriate ancillary facilities, which are available for both the school use and the community.

2.10. It is recognized that there will also be justification for some off-site investment, for example into swimming pools, and into existing pitch sites providing for rugby and hockey. These sports facilities are not justified on site, either because the new population will be too small for a viable facility, or there is sufficient potential capacity off-site to meet the expected needs of the population.

2.11. The details of the off-site investment will be considered at the application stage, likely be part of a S106 agreement.

Loddon Valley Garden Village: Development Guidelines: Appendix B4

……

Community

ii) Provide two new 3-form entry primary schools on site (including appropriate on-site early years provision) and an 8-form entry secondary school, with additional land reserved to enable expansion to 12-form entry with sixth form Space should also be reserved for appropriate playing pitch provision. Playing pitches should be co-located with other community uses to promote their accessibility and dual use.

B4.8. The key infrastructure requirements for the Loddon Valley Garden Village are set out in the council's latest Infrastructure Delivery Plan (IDP). A bespoke infrastructure funding agreement should be secured and based on the value captured from the development, and should be spent on infrastructure locally, and in the surrounding areas where suitable.

2.12. The LGV scheme responds to the draft B4 policies by ensuring that the school playing pitches are part of the dual use sports hub, which has additional grass pitches to meet the needs of the community along with other sports facilities.

2.13. B4.8 recognises the potential need for off-site investment via S106, which will be addressed in detail as the scheme progresses.

Infrastructure Development Plan: Loddon Valley Garden Village

2.14. The draft IDP has a section relating to LGV, and the sports provision is addressed on page 28.

Indoor sports: Sports hall of at least 1,532 m^2 comprising 4 courts and a 20 station health and fitness gym. Essential delivery on completion of 1,500 homes at indicative cost of £9.2m, *"could be delivered as dual use with the proposed secondary school facilities"* . Funding to be confirmed (S106, CIL, Other).

Outdoor sports: "*Sports hub consisting of: 2 x full size 3G artificial grass pitches, 4 x adult natural grass pitches, pavilion facilities (at least 4 team changing rooms)."* Essential delivery with timing to be agreed. Cost of £6m and funding to be confirmed (S106, CIL, Other). As with the indoor facilities, "*could be delivered as dual use with the proposed secondary school facilities"* .

2.15. The LGV proposals respond to the IDP by providing:

- a 4-court hall to the community specifications recommended by Sport England.
- space for a 20-station health and fitness gym.

- two 3G AGPs which are sports lit and fenced, designed to meet the specifications of the Football Association 3G AGP Register – which will enable them to be used for matches
- grass playing field area, with sufficient pitch space for both the education needs and community needs.
- changing and ancillary space to support both the school and community requirements, including social space and reception area.
- appropriate levels of car parking to support the community use which is both accessible and shared with the school.

2.16. It is also proposed that the multi-use games area which will be required under BB103 for the school, should be fenced and sports lit, in order for it to be able to be used by the community for tennis, netball or other sports requiring a hard outdoor surface. However, the upgrading of the education standard of the hard courts to a standard suitable for community use has not been included in the IDP.

2.17. As the LGV scheme is further developed, it will be necessary to update the draft IDP wording to more accurately reflect the actual provision at the sports hub, both in relation to the education elements and the community sports hub elements. The updating will need to reflect: the recommendations of the Playing Pitch Strategy and Indoor Built Facilities Strategy (once these are published); the expected costs of provision following detailed feasibility work; and the future agreed split between the education requirements and those for community sport.

3. Playing field area required – community element

3.1. The draft PPS Action Plan (p44) estimated (in its Table 2.27) the match pitch requirements for the various pitch sports if the LGV proposed allocation had 4,500 dwellings and a total population of 10,800 people, see Table 1.

Table 1: Draft PPS extract of Table 2.27 – match requirements

Adult football	1.67 matches per week
Junior football	9.01 matches per week
Mini football	8.74 matches per week
Rugby Union including youth and minis	1.11 matches per week
Hockey adult	1.63 matches per week
Hockey youth and mixed U10s	1.23 matches per week
Cricket open age and junior	104.76 matches per year

3.2. The draft PPS Action Plan (Table 2.28) provided the estimated training demand for football, rugby and hockey at the same population level. For football, this was estimated to be 40.22 match equivalent sessions per week, or the equivalent of just over one full size 3G AGP.

3.3. The PPS Action Plan (p75) suggests that Hall Farm (aka LGV) could be a "*new hub site to be delivered by WBC*", and the Recommendation was "*Could provide two 3G AGPs and four grass pitches along with ancillary provision to support this*". The cost given is £1,075,000 which is the approximate cost of one of the 3G AGPs, together with a 4-team changing pavilion with clubroom at £755,000.

3.4. The WBC Officer's Report to the Executive Committee for 26th September 2024 (p17) (Appendix 1) suggests that there will be sufficient cricket provision to meet the demand arising from new housing growth, so no additional community cricket provision is required. There could be a need for investment at the existing sites which provide for hockey and rugby, but again no new provision is required for these sports within LGV.

Modelling the community sports demand at LGV

3.5. The proposed allocation at LGV will have a lower number of dwellings and therefore lower population level than the draft PPS modelling. The development generated demand for pitch sports for 3,930 dwellings with a population of 9,432 is given in Table 2.

Table 2: Community pitch demand arising from LGV

<table>
<tr><td>Sport</td><td>Pitch size and type</td><td colspan="2">No. of pitches required</td></tr>
<tr><td rowspan="5">Football</td><td></td><td colspan="2">For football – all matches on grass, all training on 3G</td></tr>
<tr><td>Adult grass</td><td>1.5</td><td rowspan="3">Equivalent to approx 4 adult grass pitches but with more flexibility of layout.</td></tr>
<tr><td>Youth grass</td><td>7.9</td></tr>
<tr><td>Mini grass</td><td>7.7</td></tr>
<tr><td>Full size 3G AGP</td><td colspan="2">0.9</td></tr>
<tr><td>Rugby Union</td><td>Adult grass</td><td colspan="2">0.9</td></tr>
<tr><td>Cricket</td><td>Adult grass</td><td colspan="2">1.9</td></tr>
<tr><td>Hockey</td><td>Full size sand AGP</td><td colspan="2">0.4</td></tr>
</table>

3.6. It should be noted that for football, the estimated number of pitches required in Table 2 assumes that the matches are all played on grass, and most at the same time. With the proposal at LGV to have two full size 3G AGPs (both on the FA 3G AGP Register), the community demand for grass pitch space will fall dramatically, to only two youth 11v11 grass pitches. Consequently, the land take will be reduced.

3.7. The modelling in Table 2 also suggests that there is a LGV development-generated demand for 0.9 of a full size, sports lit 3G AGP to meet the training needs for football. In response LGV will provide one pitch. WBC however has an aspiration for a second full size 3G AGP at LGV which arises from the current Borough-wide identified deficit of this type of facility, as identified in the draft PPS. The funding for this second 3G

AGP is still to be confirmed.

3.8. In relation to rugby union and hockey, consideration may need to be given to a S106 contribution towards investment for improvements at existing sites.

Providing for community football matches

3.9. The draft PPS Assessment report (p55) provides a summary of the peak demand for football matches in Wokingham, all of which are at weekends:

- Adult male football: Saturday afternoon and Sunday morning;
- Adult female football: Sunday afternoon;
- Junior football: Saturday morning and Saturday afternoon;
- Mini Soccer: Saturday morning.

3.10. This peak time information has been used in Table 3 identify how many pitches are likely to be required at different times across the weekend, for each of the different formats of the game.

Table 3: Number of community pitches needed at peak time

Format/ age group	Number of teams generated by LGV	Total number of matches per week (no. teams/2)	Weekly pitch requirement for matches and peak time	Match peak time (from PPS)	Peak times % match play			
					Sat am	Sat pm	Sun am	Sun pm
Adult Male	3.5	1.8	**1 pitch Sat pm, 1 pitch Sun am**	Saturday pm and Sunday am		0.35	0.65	
Adult Female	0.6	0.3	**1 pitch fortnightly, Sun pm**	Sunday pm				1.0
Youth 11v11 Male	8.4	4.2	**4 pitches spread over Sat am & pm**	Saturday am and Saturday pm	0.5	0.5		
Youth 11v11 Female	1.7	0.9	**1 pitch either Sat am or pm**					
9v9 Boys	4.5	2.3	**2 pitches either Sat am or pm**					
9v9 Girls	1.3	0.7	**1 pitch either Sat am or pm**					
7v7 Mixed	7.3	3.7	**4 pitches Sat am**	Saturday am	1.0			
5v5 Mixed	7.7	3.84	**4 pitches Sat am**					

3.11. The next step is to consider how these matches might use the two 3G AGPs at the sports hub site, as FA affiliated matches can be played on either 3G AGPs or on grass

pitches. There are *Football Association Handbook* rules for the length of youth and mini matches, summarised in Table 4, and a period of approx 15 minutes is usually sufficient between consecutive matches. Adult matches being played in standard leagues are approx 1hr45mins in total, so need about 2 hours between matches. Walking football, small-sided football and disability teams usually play for a shorter time and may use only part of full size pitch, and these teams usually play outside of the peak match times.

Table 4: Summary of Youth and Mini Football Matches

	Match length	Half time length	Minimum match length (mins)	Max match length (mins)
5v5	10 - 20 mins E/W	5 -15 mins	25	55
7v7	20 -25 mins E/W	5 -15 mins	25	65
9v9	20 - 30 mins E/W	5 -15 mins	45	75
U13/U14	25 - 35 mins E/W	5 -15 mins	55	85
U15/U16	25 - 40 mins E/W	5 -15 mins	55	90
U17/U18	25 - 45 mins E/W	5 -15 mins	55	105

3.12. The 3G AGPs proposed at the sports hub will be marked for a number of different pitch sizes. The pitch layout in Figure 1 is from *The FA Guide to 3G Football Turf Pitch Design Principles and Layouts*, page 31, and is the 'standard' approach for community 3G AGPs. This marking out means that four mini 5v5 football matches can be played at the same time, or two 7v7, or two 9v9, or a combination thereof. Only matches for U13/U14 and above would take a whole pitch.

3.13. The options for marking out pitches, the match lengths for different age groups and the peak time requirements across the weekend can be synthesised into an indicative programme for the proposed two 3G AGPs, see Figure 2. This also enables the identification of those matches which would need to be provided for on grass as there is insufficient capacity on the 3G AGPs.

3.14. The outcome is that the community match requirements for football can be met on:

- 2 x 3G AGPs which are designed and maintained at a quality to be included in the FA 3G AGP Register. Total area required for AGPs is approx 1.70ha.
- 2 x youth 11v11 grass pitches with dimensions 97x61m including run-off, with a total area of 1.18ha.
- This pitch area needs adding to the total required for the 12FE secondary school to produce the total playing field areas required for the shared/ dual use sports hub.

3.15. In fact, this combination of football pitches at the sports hub site provides spare capacity for the further growth in the game, particularly on Sundays. These

calculations show that the draft PPS recommendation for 4 grass pitches at LGV does not accurately reflect the anticipated demand arising from LGV, even when fully built out. The draft IDP needs amending on this point.

Figure 1: Marking out 3G AGPs for multiple pitch sizes

Source: *The FA Guide to 3G Football Turf Pitch Design Principles and Layouts*

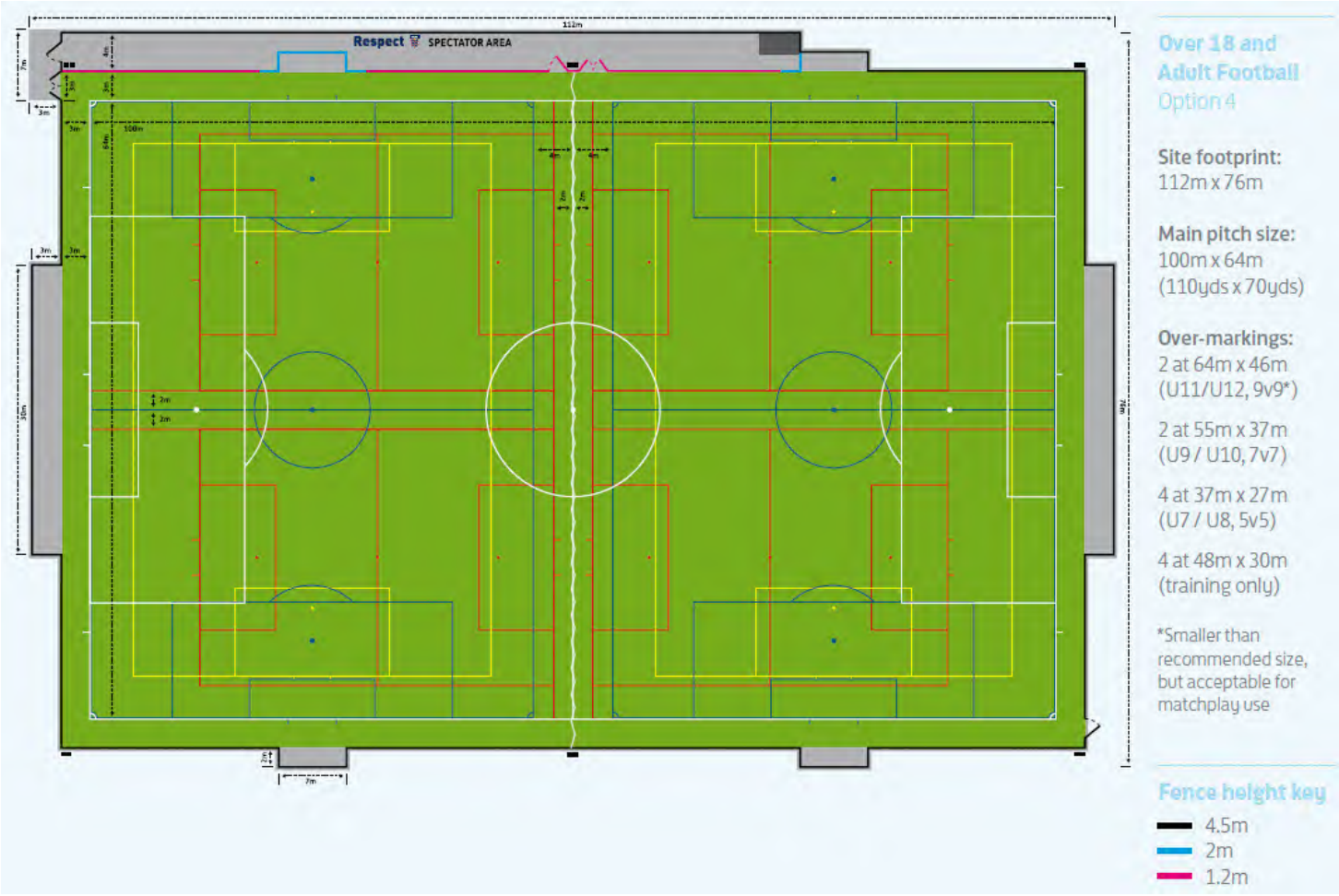

Figure 2: Indicative programming for 2 x 3G AGPs plus 2 x Youth 11v11

LVGV with 3930 dwellings, 9,432 population

Winter: start September - end April

KEY

	Regular weekly bookings
	Bookings alternate weeks
	Pitch free

AGP 1

Saturday	09.00	09.15	09.30	09.45	10.00	10.15	10.30	10.45	11.00	11.15	11.30	11.45	12.00	12.15	12.30	12.45	13.00	13.15	13.30	13.45	14.00	14.15	14.30	14.45	15.00	15.15	15.30	15.45	16.00	16.15	16.30
Q1	5v5						7v7							9v9							Adult men 11v11										
Q2	5v5						7v7							9v9																	
Q3	5v5																														
Q4	5v5																														

Sunday	09.00	09.15	09.30	09.45	10.00	10.15	10.30	10.45	11.00	11.15	11.30	11.45	12.00	12.15	12.30	12.45	13.00	13.15	13.30	13.45	14.00	14.15	14.30	14.45	15.00	15.15	15.30	15.45	16.00	16.15	16.30
Q1					Adult 11v11												Adult women 11v11														
Q2																															
Q3																															
Q4																															

AGP 2

Saturday	09.00	09.15	09.30	09.45	10.00	10.15	10.30	10.45	11.00	11.15	11.30	11.45	12.00	12.15	12.30	12.45	13.00	13.15	13.30	13.45	14.00	14.15	14.30	14.45	15.00	15.15	15.30	15.45	16.00	16.15	16.30
Q1	7v7							Youth 11v11													Youth 11v11										
Q2																															
Q3	7v7																														
Q4																															

Sunday	09.00	09.15	09.30	09.45	10.00	10.15	10.30	10.45	11.00	11.15	11.30	11.45	12.00	12.15	12.30	12.45	13.00	13.15	13.30	13.45	14.00	14.15	14.30	14.45	15.00	15.15	15.30	15.45	16.00	16.15	16.30
Q1					Adult men 11v11																										
Q2																															
Q3																															
Q4																															

Grass pitches

Pitch A: Youth 11v11 grass football

Saturday	am	pm
	Youth 11v11	Youth 11v11
Sunday	am	pm

Pitch B: Youth 9v9 and 11v11 grass football

Saturday	am	pm
	9v9	Youth 11v11
Sunday	am	pm

Ancillary facilities to support community football

3.16. There will be a need to provide at least two 'clean' team changing rooms with lockers for the two 3G AGPs. This will be with the community specification set down by the Football Foundation / Football Association / Sport England. The community specification is higher than specifications for education, but these spaces should be shared. The Football Foundation and Sport England may seek the provision of 2 x team changing rooms per 3G AGP, giving a total of 4 x changing rooms for the 3G AGP use.

3.17. There will also be a need to have at least two changing rooms for grass playing field use with lockers, in order to avoid mud being transferred to the 3G AGPs. Again, the specification for community use is higher than that for education, but the changing rooms should be a shared space. The Football Foundation and Sport England may seek the provision of 2 x team changing rooms per community Youth 11v11 pitch, giving a total of 4 x changing rooms for the grass playing field area.

3.18. It is very likely that the pitch provision will need to be supported by some social space for the community use. This will be particularly important during the mini and youth match and training times as parents may be waiting. Such social provision can also provide a necessary opportunity for some revenue generation as well as making the facility more attractive to users. There will be need for a café/kitchenette, but a bar-type facility is unlikely to be needed or to be appropriate.

3.19. There will also need to be a reception area and office for the facilities manager. What is provided on site in relation to the ancillary facilities will in part depend upon the other community facilities provided, including sports hall and gym.

3.20. Additionally, there will need to be sufficient shared car and cycle parking, with appropriate access for both the school and community use.

4. Indoor and other sports facilities

On site provision

4.1. The evidence base for the IDP in relation to the indoor sports provision is not yet available, and may not be until early 2025. The following have therefore been assumed to need to be incorporated into the design of the dual use sports hub, but this may need to be reviewed once the relevant strategy is available.

Sports hall

4.2. The IDP suggests that LGV requires provision of a 4-court sports hall on site, and the emerging policy direction is clear, that it should be shared with education. The LGV consortium provisionally agree with, and support this shared/ dual use approach. The IDP

suggests that the 4-court hall to be provided is 1,532 sqm, which is the size of a 4-court hall plus its associated ancillary facilities.

4.3. A community size sports hall is slightly larger at 34.5 x 20.0 x 7.5m than one for education alone, its design is better, and its associated changing is of a higher quality, including the provision of lockers. It therefore costs more than an education standard sports hall.

4.4. The Sport England Sports Facilities Calculator (September 2024)[1] gives for a population of 9,432 at LGV a development generated demand of 0.6 of a 4-court hall.

4.5. It is therefore appropriate to use the value of the demand generated by the development to upgrade the education standard sports hall on the LGV site to one suitable for community use.

Gym – 20 station

4.6. The draft IDP includes a requirement for the provision of a 20 station fitness gym, and the emerging policies of the Local Plan suggest that this should be located within the dual-use sports hub. The approximate GIA would be around 100 sqm. An allowance for this area has been incorporated into the layout requirements for the sports hub site. The fitness gym does not require separate changing spaces as the users can share those provided for the sports hall. This provision of the fitness gym will in part meet the draft policy standard for "Activity halls" of 41.31 sqm/1000 population, with other areas being provided across the allocation as part of the multi-activity spaces in the community halls.

Tennis

4.7. The IDP does not anticipate the provision of tennis courts for community use at LGV, but the school will be required to have hard courts which are large enough for at least 3 netball courts and are likely to be also marked out for tennis. If the courts are sports lit to a standard to enable tennis, then this could be an additional facility within the sports hub.

5. Achieving delivery

5.1. The LGV consortium agree with the emerging Local Plan policy that the community sports provision should be on a shared /dual use site with education, and have planned for this in the allocation proposal.

5.2. This paper has reviewed the community sports elements of the dual-use proposed sports hub, as the education elements are being addressed separately. With two 3G AGPs available for community use at weekends, then the grass playing field area required for

[1] https://www.activeplacespower.com/pages/sportsfacilitycalculator

dedicated community use is 1.18ha. This area will be in addition to the area required for the 12FE secondary school.

5.3. The LGV consortium recognise that the success of the dual use sports hub vision will depend on:

- Suitable masterplanning and layout of the sites to facilitate both school and community use.
- Suitable facility specifications.
- Agreement on phasing, and delivery to the required standards.
- A Community Use Agreement which is in in accordance with the Sport England guidance, for the lifetime of the sports facilities.

5.4. As the concepts of proposal are developed further, the consortium will seek to engage with WBC, Sport England and the national governing bodies in order to design and deliver a facility of which the future Garden Village residents can be proud.

Funding the sports hub

5.5. The draft IDP suggests that the costs of providing the community elements of the shared use/dual use sports hub will be a combination of S106, CIL and "Other", but there is no further breakdown to show how the potential costs will be met. Delivering the shared / dual use sports hub will therefore be a matter for future discussion.

6. Off-site sports provision

6.1. The emerging Local Plan policies HC4 and B4.8 refer to off-site investment in mitigation. The HC4 policy suggests that the amount of swimming pool space should be 8.26 sqm per 1000 population. The Sport England Sport Facilities Calculator in September 2024, suggest that there is a need for 102 sqm of water space for the forecast LGV population of 9,432 once fully built out, or just over 10.85 sqm water space per 1000 population.

6.2. The LGV consortium note that the relevant evidence base is not yet published, which will help to confirm the level of any the off-site contribution and the justification for any S106 investment.

7. Conclusion

7.1. The objectives of the emerging Local Plan for Wokingham for a shared/dual use secondary school sports hub facility can be delivered through the allocation as proposed at LGV.

7.2. The provision of two full size sports lit 3G AGPs on site will very largely meet the pitch needs for football arising from LGV when fully built out, and only two youth 11v11 football pitches

(1.18ha) will be required to be set aside for dedicated community use on the grass playing field area. There will need to be additional dedicated playing field space for the secondary school, including provision for up to 12FE.

7.3. There will be a need for separate changing provision for the 3G AGPs and the outdoor grass playing field space. The number of changing rooms remains to be confirmed, but at least 4 team changing rooms will be provided, which will be to community standard and will be shared / dual use.

7.4. The sports hall will need to be of community use standard, which is slightly larger, better quality and with better changing provision than an education only sports hall. The costs of the uplift is justified by the demand for sports hall space which will be generated by the LGV.

7.5. The community elements of the sports hub will require a reception, some social space and office space for the manager, and these are unlikely to be used by the school. However, the parking can be dual use with the school.

7.6. The success of the sports hub will depend on appropriate design to make the facilities easily available and attractive to use. They will also need to be secured long term for the community. The LGV consortium will be actively progressing on these elements in the next few months along with discussions about how the sports facilities will be funded.

APPENDIX 1

TITLE	**Playing Pitch Strategy**
FOR CONSIDERATION BY	The Executive on Thursday, 26 September 2024
WARD	(All Wards);
LEAD OFFICER	Director, Place and Growth - Giorgio Framalicco
LEAD MEMBER	Executive Member for Economic Development, Sport, Leisure and the Arts - Mark Ashwell

Please note that this section is for Members' information only and will not be included in the published version of the report:	
Key Decision	The answer to this question is usually yes. A full definition of a key decision can be found in Chapter 5.6 of the Constitution.
Politically Sensitive	Advise of any political sensitives around the decision
Policy change	If yes provide information on what the change is
Have the legal implications been considered by Legal Services?	Legal Services must provide comments/clearance of all reports prior to being submitted to CLT. Please state which Officer was consulted and provide their response.
Have the financial implications been considered by Finance?	Finance officers must provide comments/clearance of all reports prior to being submitted to CLT. Please stated which Officer was consulted and provide their response.
Public consultation required	Provide information on any consultation that is to be carried out
Communication on Decision Made and Implementation	Need to include information about who you are communicating with (both internal and external)
Have the equalities implications been considered by the Inclusion Team (inclusion.team@wokingham.gov.uk)**?**	Have you consulted the Inclusion team on the equalities impact of the report? Has the Inclusion Team signed off the EQIA?
Call in likely	If an item is particularly sensitive there is a likelihood that it will be called in. Further information can be obtained from Democratic Services or in Chapter 6.3.29 of the Constitution.
If yes, implications of the delay	
Key Political Issues, including any PR or other implications	
Key Risks surrounding the decision and mitigation actions to be taken.	

PURPOSE OF REPORT (INC STRATEGIC OUTCOMES)

To inform members of the latest work on the need for outdoor sports provision within the borough between now and 2040 and the proposed Action Plan to meet that need.

RECOMMENDATION

That the Executive:

1. Notes the identified need for outdoor sports facilities within the Playing Pitch Strategy – Assessment Report.
2. Approves the Playing Pitch Strategy – Action Plan as the basis for further work on the provision outdoor sports facilities within the borough.
3. Notes that the Playing Pitch Strategy will contribute to wider Strategic Aims of the Council and Marmot principles of healthy lifestyles, public health agenda, quality of life and overall wellbeing.

EXECUTIVE SUMMARY

An active lifestyle is great for both our physical and mental wellbeing, It can give us more energy, help to make us feel happier and more connected to the places and spaces where we live. There is clear evidence that an active lifestyle can reduce your risk of major illnesses, such as coronary heart disease, stroke, type 2 diabetes and cancer and lower the risk of an early death by up to 30%. Consequently, it is also clear that the provision of additional facilities such as playing pitches that provide opportunities for residents take up or maintain an active lifestyle have far reaching impacts to our residents and to the Council.

It is worth noting that the Wokingham playing pitch facilities to enable more than 10,000 residents to regularly enjoy participating in sports. The PPS is the key tool in assessing the current and future need for these facilities and will ensure that we can continue to offer these opportunities to our residents as the borough grows.

The Wokingham Playing Pitch Strategy (PPS) is an assessment of the supply and demand for sports pitches and how that may change over time from the present day to 2040. It has been undertaken in line with Sport's England's 'Playing Pitch Strategy Guidance: An approach to developing and delivering playing pitch provision', which included comprehensive consultation with National Governing Bodies (NGB) and sports clubs.

The PPS will be the key document that can be used by all stakeholders, including the council, to focus and prioritise investment in sports provision to both existing residents and to communities that will form as a result of development.

The PPS assesses both the current and future needs for football, cricket, rugby and hockey, as well as the non-pitch needs for tennis, bowls and netball.

The PPS confirmed football as by far the most popular sport within Wokingham Borough with 70 football clubs having 654 teams between them. Cricket is the next most popular sport with 20 cricket clubs having 192 teams between them. Rugby and hockey currently only have 4 and 3 clubs respectively within Wokingham Borough, having 46 and 93 teams respectively.

It is notable that most of the current identified needs for sport pitches remains stable. This is despite projections suggesting a 15% reduction in number of people under 16 years of age (under sixteens) and a small rise in the number of adults between now and 2040 despite the projected increase in the number of households in this period.

The key need identified is for an additional 8 Artificial Grass Pitches (AGPs) to meet the requirements of borough football teams. Whilst there are needs identified for the other sports these are modest by comparison.

The PPS action plan recommends that the majority of the need for new AGPs should be delivered through a number of key development funded projects such as Grays Fruit Farm, Hogwood Farm and potentially the Hall Farm strategic development proposed (subject to its inclusion in the proposed submission version of the Local Plan Update).The location of other AGPs would be subject to an acceptable site being identified. The PPS action plan identifies that the modest needs for other sports can be delivered either by existing projects that are underway or by enhancements to existing facilities. Also to note that the PPS, identifies locations and evidence of strategic need , other external agencies, organisations or clubs, could use the PPS with Council support to lead on projects and initiatives to attract facilities into the Borough , in this sense the strategy is an enabling document.

BACKGROUND

A Playing Pitch Strategy (PPS) is an assessment of the supply and demand for sports pitches. As well as considering the current position, the assessment also considers how need may change over time as a result of the anticipated growth in population and changes in peoples' attitudes towards sports.

Evidence is key to allowing the council or other clubs, agencies or organisations to effectively deliver sports provision to both existing residents and to communities that will form as a result of development. This may include protecting and evolving existing sports pitches, as well as the provision of new facilities where necessary.

The PPS has been undertaken in line with Sport's England's 'Playing Pitch Strategy Guidance: An approach to developing and delivering playing pitch provision'. The process included comprehensive consultation with National Governing Bodies (NGB) and sports clubs.

The PPS assesses both the current and future needs across the borough for football, cricket, hockey and rugby, as well as non-pitch needs for tennis, bowls and netball.

The PPS, is obviously focussed upon Sport, however the link into the Public Health Agenda, wellbeing , community cohesion and interaction should not be underestimated and those intangible benefits will also apply to the borough.

BUSINESS CASE

The PPS comprises two elements:
PPS: assessment report; and
PPS: action plan.

The PPS: assessment report outlines anticipated changes in population. Over the period to 2040, there are projected to be some reductions in the size of certain age groups. This is particularly prevalent between the ages of 4 y and 16 years old, which are key ages looked at by NGB when assessing the demand for pitches.

The PPS: action provides a set of recommendations that are prioritised for each sport, area and site. It can be used by all stakeholders, including the council, to identify where investment might be prioritised for each sport in order to meet any of the shortfalls that have been identified. This is also the case when new provision is being proposed linked to housing growth that is being promoted through the Local Plan Update

It is worth noting that whilst the PPS identifies the current and future demand for additional outdoor sports facilities, delivery projects identified within the PPS Action Plan, will need to be brought forward with their own financial (capital and revenue) business cases.

<u>Key findings</u>

The PPS confirmed that football is by far the most popular sport within Wokingham Borough with 70 football clubs having 654 teams between them. Cricket is the next most popular sport with 20 cricket clubs having 192 teams. Rugby and Hockey currently only have 4 and 3 clubs respectively having 46 and 93 teams respectively.

The likely need for all playing pitch types appear to be driven by demographic change with projections suggesting a 15% reduction in numbers of under 16 years of age (under sixteens) and a small rise in the number of adults between now and 2040 despite the projected increase in the number of households in this period.

It is worth noting that participation levels remain lower for women and girls both within Wokingham borough and nationally, despite some high-profile campaigns (such as This Girl Can). The reasons for this inequality are complex but ensuring that our outdoor sports facilities have adequate facilities for women and girls is an essential part of addressing this issue.

Football
The PPS shows that the most significant demand is for 3G Artificial Grass Pitches (APGs) to allow all teams within the borough to meet the Football Associations aspiration for each team to have at least 1hr/week of training. There are currently 654 football teams in Wokingham Borough meaning there is currently a requirement for 17 full size 3G AGPs. Given that there are already 8 full size 3G AGPs and two smaller sized 3G AGPs within the borough, the current shortfall is 8 3G AGPs. Due to the expected demographic change, this need remains unchanged in 2040 rather than increasing.

A modest demand for grass pitches there being a small shortfall of around 9 pitches for adults and sufficient provision for under sixteens. Whilst the shortfall for adult pitches remains in 2040, there is predicted to be a surplus of under sixteens pitches by this date.

Cricket
The PPS shows that there is currently very limited spare capacity for additional cricket teams even with a significant number of sites overplayed. However there are 3 new cricket facility either under construction or planned within the borough (two in Shinfield parish and one in Arborfield and Newlands parish) that should meet any additional needs and reduce levels of overplay. It is also worth noting that the demand for adult cricket shows a very modest increase by 2040, with demand for under sixteens forecast to reduce substantially.

Hockey
Whilst the PPS shows that there is currently a small demand for an additional hockey AGP, the action plan suggests could be met through free up space on the dedicated hockey sites by migrating some football training sessions to the new facilities within the borough. It should be noted that the demand for hockey appears to be reduced in 2040, especially with regards to under sixteens.

Rugby
The PPS currently shows a small demand for circa 6 grass rugby pitches across the borough which remains unchanged in 2040. The action plan suggests that this need could be met through improvements to the condition of existing grass pitches rather than the delivery of new facilities.

Football Action Plan
The PPS action plan identifies the following suggested delivery strategy for the key football need for 8 additional AGPs and up to 9 adult grass pitches:

- 3 x 3G AGPs and 4 adult grass pitches at Gray's Fruit Farm, adjacent to the South Wokingham strategic development location.
- 1 x 3G AGPs and 1 adult grass pitch at Hogwood Farm as part of the Arborfield Garrison strategic development location.
- 1 x 3G AGPs at Woodley most likely on an existing grass pitch – a feasibility study is required in order to identify an acceptable sites.
- 1 x 3G AGPs at Earley most likely on an existing grass pitch - a feasibility study is required in order to identify an acceptable sites
- 2 x 3G AGPs and 4 adult grass pitches as part of the potential Hall Farm strategic development location.

It is important to note that that the suggestion of additional pitches in the Woodley and Earley area are subject to suitable sites being available. Further investigation and engagement is required to consider achievability.

It is also important to note that the reference to the potential Hall Farm strategic development location is within the context of the Local Plan Update (LPU) Revised Growth Strategy Consultation (2021) which proposed a major development in this area. It is recognised that the LPU Revised Growth Strategy was a consultative position and subject to change. Should the LPU process not continue this proposal and promote alternative major development elsewhere, relocating the PPS recommended pitch provision to alternative area would be expected.

FINANCIAL IMPLICATIONS OF THE RECOMMENDATION

The Council faces unprecedented financial pressures as a result of; the longer term impact of the COVID-19 crisis, Brexit, the war in Ukraine and the general economic climate of rising prices and the increasing cost of debt. It is therefore imperative that Council resources are optimised and are focused on the vulnerable and on its highest priorities.

	How much will it Cost/ (Save)	Is there sufficient funding – if not quantify the Shortfall	Revenue or Capital?
Current Financial Year (Year 1)	Nil	State Yes or No and provide further explanation as appropriate	
Next Financial Year (Year 2)	Nil	Yes or No	
Following Financial Year (Year 3)	Nil	Yes or No	

Other Financial Information
PPS – Action Plan delivery projects will be brought forward with their own financial business cases.

Legal Implications arising from the Recommendation(s)
Include comments from legal officers, which set out all legal implications arising from the recommendations.

Stakeholder Considerations and Consultation
Include information relating to any consultation that is due to be carried out including date and how the consultation will be carried out

Public Sector Equality Duty
Please confirm that due regard to the Public Sector Equality Duty has been taken and if an equalities assessment has been completed or explain why an equalities assessment is not required.

Climate Emergency – *This Council has declared a climate emergency and is committed to playing as full a role as possible – leading by example as well as by exhortation – in achieving a carbon neutral Wokingham Borough by 2030*
Please state clearly what the impact of the decision being made would be on the Council's carbon neutral objective.

Reasons for considering the report in Closed Session
Provide justification of why the report should be in Part 2 setting out how the public interest in withholding the information outweighs the public interest in disclosing it

List of Background Papers
Wokingham Borough Council Playing Pitch Strategy Assessment report – August 2023 Wokingham Borough Council Playing Pitch Strategy Action Plan – August 2023

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Project Reference 794-ENV-GDE-JER9482-ACO

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0	Jonty Stewart MSc, MIOA, MIET	Yanko Yankov Beng, MIOA	Jonty Stewart MSc, MIOA, MIET	31 October 2024

Noise & Vibration Statement

INTRODUCTION

1.1 This document supports representations on behalf of the University of Reading ('the University') in response to Wokingham Borough Council (WBC's) Regulation 19 pre-submission consultation on the Local Plan Update (LPU), focusing on Policy SS13 which allocates the Loddon Valley Garden Village (LGV).

1.2 It should be read as part of a suite of documents submitted on behalf of the University in November 2024 including policy representations, Vision Document, and other technical reports. It should be read as a high-level summary of noise and vibration matters at a preliminary stage, i.e. prior to the formal Environmental Impact Assessment (EIA), consultation and planning application stages.

1.3 It provides a summary of the baseline conditions at the site, assesses the likely effects of the Proposed Development, and recommends the likely measures required to mitigate the identified adverse effects of the Proposed Development on the environment in respect of noise and vibration.

1.4 The noise and vibration assessment will cover:

- Noise and vibration effects on existing sensitive receptors surrounding the site as a result of the proposed demolition / construction works (any effects will be temporary and direct);
- Noise and vibration effects on new sensitive receptors formed as part of the Proposed Development due to its phased nature, as a result of the proposed demolition / construction works (any effects will be temporary and direct);
- Noise effects at existing sensitive receptors due to changes in traffic on existing roads as a result of the construction / demolition works (any effects will be temporary and indirect);
- Noise effects on existing sensitive receptors generated by the operation of building services plant and equipment associated with the Proposed Development (any effects will be long-term and direct);

- Noise effects on existing sensitive receptors due to changes in traffic on existing roads as a result of the operation of the Proposed Development (any effects will be short and/or long-term and direct); and
- Noise effects resulting from the operation of the Proposed Development on new sensitive receptors that are formed as part of the development itself.

1.5 Where necessary, appropriate noise and vibration mitigation measures will be proposed

1.6 It is considered unlikely that the operation of a residential led development will result in significant vibration effects at nearby receptors and therefore it has been proposed that vibration effects during operation are **scoped out** of the assessment.

1.7 A review of currently available information has not identified any significant sources of vibration in close proximity to the Proposed Development. Therefore, it is proposed that assessment of impact for existing vibration affecting the Proposed Development is **scoped out** of the assessment

BASELINE SUMMARY

1.8 A preliminary desktop review was carried out in 2022 that identified the main noise sources in the area, along with potential mitigation options in the form of noise barriers, site layout, buffer zones, building orientation, and building layout. This initial review identified that some areas of the site are likely to be subject to relatively high levels of noise, in particular from the M4 motorway. It is therefore important that noise is considered early in the design of the site so that, where possible, impacts can be minimised through layout and planning.

1.9 No baseline noise survey has yet been undertaken. Details of the long-term (i.e. 7 days or more) monitoring locations to be proposed through the EIA scoping process are presented below in Figure 1. Table 1 presents a summary of the assessment activity proposed at each monitoring location. These long-term monitors will be supplemented by short-term measurements as required.

Table 1 Proposed monitoring locations and assessment activity

ID	Description
LT1	Residual and background noise levels around the middle of the proposed residential development to inform site suitability assessment and calibrate noise model
LT2	Residual and background noise levels adjacent to the M4 to inform the noise model
LT3	Residual and background noise levels adjacent to Mole Road to inform the noise model
LT4	Residual and background noise levels adjacent to Church Lane to inform the noise model
LT5	Residual and background noise levels adjacent to A327 Reading Road to inform the noise model

1.10 All measurements will be carried out in general accordance with guidance provided in BS 7445-2:1991[1] and BS 4142:2014+A1:2019[2].

Figure 1 Proposed Noise Monitoring Locations

1.11 Noise sensitive receptors to be assessed subject to the EIA scoping process, are presented in Figure 2 and Table 2.

[1] British Standard 7445-2:1991 "Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use"

[2] British Standard 4142:2014+A1:2019. "Methods for rating and assessing industrial and commercial sound"

Figure 2 Identified Noise Sensitive Receptors

Table 2 Proposed NSRs and Assessment Type (Construction, Operation or Traffic)

ID	Name	Latitude	Longitude	Type		
R1	Ducketts Mead	51°25'2.89"N	0°56'48.05"W		O	T
R2	Notton Way	51°25'10.00"N	0°56'19.27"W		O	T
R3	Finbeck Way	51°25'12.47"N	0°56'9.30"W		O	T
R4	Rainworth Close	51°25'15.62"N	0°55'56.33"W		O	T
R5	Bassett Close	51°25'19.24"N	0°55'3.83"W		O	T
R6	Witcham Close	51°25'22.79"N	0°54'49.56"W		O	T
R7	Barn Croft Drive	51°25'31.42"N	0°54'25.33"W		O	T
R8	Mill Lane (N)	51°25'44.68"N	0°54'3.24"W		O	T
R9	Mill Lane (S)	51°25'33.80"N	0°53'49.49"W		O	
R10	Rhodes Close	51°25'52.15"N	0°53'30.48"W		O	T
R11	Duffet Drive	51°25'43.56"N	0°53'28.68"W		O	T
R12	Glasspool Road	51°25'35.65"N	0°53'23.53"W	C	O	T
R13	Budd Grove	51°25'32.96"N	0°53'14.08"W	C	O	T
R14	Lark Rise	51°25'25.84"N	0°53'20.65"W	C	O	T

ID	Name	Latitude	Longitude	Type		
R15	Mill Lane	51°25'22.23"N	0°53'25.15"W	C	O	T
R16	Summer Court	51°25'19.96"N	0°53'22.16"W	C	O	T
R17	New Road	51°25'15.41"N	0°53'13.83"W	C	O	T
R18	Harrow Way	51°25'9.44"N	0°53'37.13"W	C	O	
R19	Gipsy Lane	51°25'5.32"N	0°53'46.20"W	C	O	
R20	Betty Grove Lane	51°25'9.32"N	0°53'58.98"W	C	O	
R21	Julkes Lane	51°25'0.29"N	0°54'24.11"W	C	O	
R22	Parkcorner Lane	51°24'50.81"N	0°54'2.40"W	C	O	
R23	Carters Hill Arborfield	51°24'46.48"N	0°54'11.74"W	C	O	
R24	Copse Barnhill Lane	51°24'37.73"	0°53'52.74"W	C	O	T
R25	Mole Park Cottage	51°24'33.10"N	0°53'50.39"W	C	O	T
R26	Sindlesham Road	51°24'28.05"N	0°53'53.03"W	C	O	T
R27	Mole Bridge Farm	51°24'22.63"N	0°54'1.47"W	C	O	T
R28	Mole Road	51°24'17.32"N	0°54'10.24"W	C	O	T
R29	Arborfield Church	51°24'14.75"N	0°54'35.17"W	C	O	
R30	St Bartholomew's Church	51°24'15.87"N	0°54'42.73"W	C	O	
R31	Carters Hall Lane	51°24'41.31"N	0°54'43.73"W	C	O	
R32	Longcroft	51°24'12.45"N	0°54'46.18"W	C	O	T
R33	Phyllena	51°24'10.87"N	0°54'54.25"W	C	O	T
R34	The Old Rectory	51°24'13.33"N	0°55'9.13"W	C	O	
R35	Church Lane	51°24'14.84"N	0°55'14.40"W	C	O	
R36	Greensward Cottage	51°24'6.41"N	0°55'19.06"W	C	O	T
R37	Hall Farm (S)	51°24'20.91"N	0°55'25.45"W	C	O	
R38	Hall Farm (W)	51°24'23.55"N	0°55'32.98"W	C	O	
R39	Hall Farm (E)	51°24'24.23"N	0°55'22.01"W	C	O	
R40	Hall Farm (N)	51°24'27.55"N	0°55'29.17"W	C	O	
R41	The Bridge House	51°24'13.51"N	0°55'52.08"W	C	O	T
R42	Reading Road (W)	51°24'18.32"N	0°56'17.76"W	C	O	T
R43	Parrot Farm	51°24'18.78"N	0°56'27.94"W	C	O	T
R44	Alexandra Walk	51°24'34.06"N	0°56'23.78"W		O	T
R45	Phillips Drive	51°24'39.29"N	0°56'21.04"		O	T
R46	Cutbush Lane	51°24'43.81"N	0°56'22.41"W		O	T
R47	Hawthorn	51°24'49.17"N	0°56'30.11"W		O	T
R48	Chrysanthemum Drive	51°24'48.98"N	0°56'50.41"W		O	T
R49	Hyde End Road	51°24'16.72"N	0°56'45.59"W			T
R50	Hollow Lane	51°24'25.11"N	0°56'47.12"W			T
R51	Walden Avenue	51°24'1.30"N	0°54'56.32"W			T
R52	Greensward Lane	51°23'59.95"N	0°55'16.60"W			T
R53	Sindlesham Road	51°23'55.37"N	0°54'23.66"W			T

ID	Name	Latitude	Longitude	Type		
R54	King Street Lane	51°25'22.81"N	0°53'2.89"W			T
R55	Bearwood Road	51°25'15.69"N	0°53'0.30"W			T
R56	Longdon Road	51°25'30.41"N	0°52'45.83"W			T
R57	Hatch Farm Way	51°25'31.65"N	0°53'4.23"W			T
R58	A329 Reading Road	51°26'10.46"N	0°53'37.81"W			T
R59	Wokingham Road	51°26'16.46"N	0°54'5.57"W			T
R60	Rushey Way	51°25'49.27"N	0°54'9.97"W			T
R61	Shinfield Road	51°25'11.65"N	0°56'50.25"W			T
R62	Toad Cottage	51°25'6.22"N	0°53'31.58"W			T

1.12 There is the potential for existing sources of noise to affect the suitability of the site for its proposed uses. The main pollution sources likely to affect the site are:

- Noise from road traffic on the M4 motorway;
- Noise from road traffic on the A327 and A329, and other roads within the vicinity of the site.

1.13 For this study, the existing acoustic environment at the site will be characterised by drawing on information from the following sources:

- Defra noise mapping data[3] which shows typical daytime and nighttime noise levels across the UK, as presented in Appendix A; and
- Unattended long-term noise monitoring to be undertaken by RPS at a minimum of five representative locations, supplemented by attended short-term monitoring as required.

LIKELY EFFECTS OF THE PROPOSED DEVELOPMENT

1.14 The noise and vibration impact assessment will include consideration of the following potential effects:

Construction / demolition phase

1.15 Noise and vibration effects on existing sensitive receptors surrounding the site as a result of the proposed demolition / construction works (any effects will be temporary and direct).

1.16 Noise and vibration effects on new sensitive receptors formed as part of the Proposed Development due to its phased nature (any effects will be temporary and direct).

[3] Accessed from http://www.extrium.co.uk/noiseviewer.html

1.17 Noise effects at existing sensitive receptors due to changes in traffic on existing roads as a result of the construction / demolition works (any effects will be temporary and indirect).

Operational phase

1.18 Noise effects on existing sensitive receptors, and on new sensitive receptors that are formed as part of the development, generated by:

- The operation of building services plant and equipment associated with the Proposed Development (any effects will be long-term and direct)
- Changes in traffic on existing roads as a result of the operation of the Proposed Development (any effects will be short and/or long-term and direct).

IMPACTS ON SURROUNDING AREA

1.19 From a noise and vibration perspective, an impact is considered to result from a change in the existing noise and/or vibration environment. This could be an increase or decrease in noise levels, the introduction of a new noise or vibration source or potentially the removal of an existing sound. Impacts can also occur when new sensitive receptors are introduced into the existing noise and/or vibration environment. These impacts will result in effects that could include, but may not be limited to, the following:

- Annoyance
- Changes in speech intelligibility
- Task disturbance
- Sleep disturbance
- Building damage
- Interference with sensitive equipment

1.20 The assessment of noise and vibration impacts during the construction / demolition phase will be carried out qualitatively and, where appropriate information is available, quantitatively based on guidance provided in BS:5228-1:2009+A1:2014 Part 1: Noise[4] and BS:5228-2:2009+A1:2014 Part 2: Vibration[5].

[4] British Standard 5228-1:2009+A1:2014. “Code of practice for noise and vibration control on construction and open sites - Part 1: Noise”

[5] British Standard 5228-2:2009+A1:2014. “Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration”

1.21 The impact of changes in traffic noise as a result of the construction / demolition phase will be predicted based on the methodology contained CRTN[6] and assessed based on guidance provided in LA 111[7].

1.22 The impact of operational noise from the Proposed Development (assumed to be primarily commercial / industrial noise associated with building services plant / equipment) on existing receptors will be assessed based on the guidance provided in BS 4142:2014+A1:2019.

1.23 The impact of changes in traffic noise as a result of the operation of the Proposed Development will be predicted based on the methodology contained in CRTN and assessed based on guidance provided in LA 111.

1.24 The impact of existing transportation noise sources on the Proposed Development will be assessed based on guidance provided in the ProPG[8], BS 8233:2014[9] and BB93[10].

1.25 The impact of existing industrial and commercial noise sources on the Proposed Development will be assessed based on the guidance provided in BS 4142:2104+A1:2019 and BB93.

LIKELY MITIGATION MEASURES REQUIRED FOR THE PROPOSED DEVELOPMENT

Construction / Demolition Phase Noise Mitigation Measures

1.26 To reduce the potential impact of noise levels generated by the construction phase of the Proposed Development at noise sensitive receptor locations in the immediate vicinity of the Site, mitigation measures will be required. These can be included within a Construction Environmental Management Plan, which can be controlled through a planning condition.

1.27 Noisy construction works may be restricted (e.g. to daytime hours between 0800 and 1800 hours Monday to Friday and 0800 to 1300 hours Saturdays, with no noisy work permitted on Sundays or Bank Holidays).

[6] Calculation of Road Traffic Noise 1988 (CRTN, 1988)

[7] Design Manual for Roads and Bridges – LA111 – Noise and vibration - Revision 2 (LA 111, 2020)

[8] Professional Practice Guidance on Planning & Noise – New Residential Development (ProPG, 2017)

[9] British Standard 8233:2014 “Guidance on sound insulation and noise reduction for buildings”

[10] Building Bulletin 93: Acoustic Design for Schools: Performance Standards (BB93, 2015)

1.28 Under Section 60 of the COPA 1974 Act the local authority has the power to serve a notice which could impose requirements as to the way in which works are to be carried out. This could specify times of operation, maximum levels of noise which should be emitted and the type of plant which should or should not be used. This is a common way of enforcing reasonable levels of construction noise.

1.29 However, it may be preferable for the chosen contractor to obtain prior consent under Section 61 of COPA 1974. Section 61 enables anyone who intends to carry out works to apply to the local authority for consent. Under Section 61 the local authorities and those responsible for construction work, have an opportunity to settle any problems, relating to the potential noise, before work starts.

1.30 The CEMP will require that best working practice will be implemented during each phase of the earthworks and construction works at the Site. The construction works will follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction sites, Parts 1 to 5, 2003.

1.31 The following measures may also be included to minimise noise emissions:

- When works are taking place within close proximity to the sensitive receptors identified, the screening of noise sources via the erection of temporary screens will be employed.
- All machinery will be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers.
- Site staff will be made aware that they are working adjacent to a sensitive area and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios.
- As far as possible, the avoidance of two noisy operations occurring simultaneously in close proximity to the same sensitive receptor.
- Adherence to any time limits imposed on noisy works by the local authority.
- Implement set working hours during the week and at weekends.
- Ensure engines are turned off when possible.
- Should earthworks and construction activities need to be carried out during night-time hours, the local authority may include a planning condition that requests advance notice and details of any night working to be provided.

Construction Phase Vibration Mitigation Measures

1.32 BS5228-2 recognises that the most common form of vibration associated with piling is the intermittent type derived from conventional driven piling. Whilst it is recognised that the piling process will need to be selected on the basis of the strata to be encountered, the loads to be

supported and the economics of the system, careful consideration (by the appointed Developer(s)) will be given to the type of piling to be used in order to minimise the potential for vibration to be generated by any necessary piling.

1.33 The receptors likely to be affected by piling will vary depending on the phase of the Proposed Development under construction. Once the precise building locations and ground conditions for each location and type(s) of piling are confirmed, vibration levels will be estimated and recommendations for control made as appropriate.

1.34 To keep ground borne vibration to a minimum the following measures (as referred to in BS5228-2) may be put in place and enshrined within the CEMP:

- Substitution: Where reasonably practicable, plant and or methods of work likely to cause significant levels of vibration at the receptors identified will be replaced by less intrusive plant/methods of working; and
- Isolation of plant at source: This may prove a viable option where the plant is stationary (e.g. a compressor, generator) and located close to a receptor.

1.35 There are a number of measures that can be implemented, depending upon the type of piling chosen (e.g. continuous flight auger (CFA) piling produces significantly less vibration than conventional driven piling and, therefore, fewer mitigation measures would be required if CFA piling were chosen as the preferred method). Additionally, the distance between the piling rig and the receptors has a significant bearing upon the likely impact, and the vibration produced by piling is transient and occurs in any one location for only a limited period of time.

1.36 BS5228-2 indicates that mitigation might include the use of alternative methods, removal of obstructions, provision of cut-off trenches, reduction of energy input per blow, reduction of resistance to penetration. As the construction programme and methodologies become more defined, earthworks and construction vibration will be reviewed and a detailed strategy for control will be devised and implemented.

Operational Phase Noise Mitigation Measures

1.37 The following mitigations options are likely to add the most value to the project and will be incorporated as part of the early site layout design:

- Using less sensitive buildings / internal space planning to provide screening to more sensitive elements of the development;
- Consideration of the feasibility of a noise barrier / bund on the northern boundary of the site (particularly in the north eastern zone); and
- Optimising the site layout to maximise acoustic screening.

1.38 Although undertaking ‘good acoustic design’ and considering noise will be important though the whole site, we believe the areas most likely to benefit from early consideration of noise impacts and appropriate mitigation are the north of the site (western, central and eastern areas) and, to a lesser extent, the southwest around Arborfield Road.

1.39 Mitigation measures in the form of appropriate glazing and ventilation will be required, and will be specified according to requirements to meet guideline internal noise levels from BS8233:2014.

1.40 With respect to any new plant and equipment introduced as part of the development, mitigation in the form of in-line attenuators, enclosures and barriers will be deployed such effects on NSRs are minimised and significant adverse impacts avoided.

SUMMARY

1.41 The main noise pollution sources affecting the site are identified as road traffic on major roads adjacent to or within the site. Secondary sources include new plant and equipment installed as part of the development.

1.42 While the proposed site is large and complex, with many buildings and areas of varying usage, there are no technical impediments to compliance with policy and planning guidance that cannot be overcome by mitigation including good acoustic design and considered site layout.

APPENDIX A – EXISTING NOISE CONDITIONS

DEFRA noise mapping data was accessed from www.extrium.com on 30th October 2024.

Figure A.1 presents the DEFRA noise mapping across the site for the daytime period.

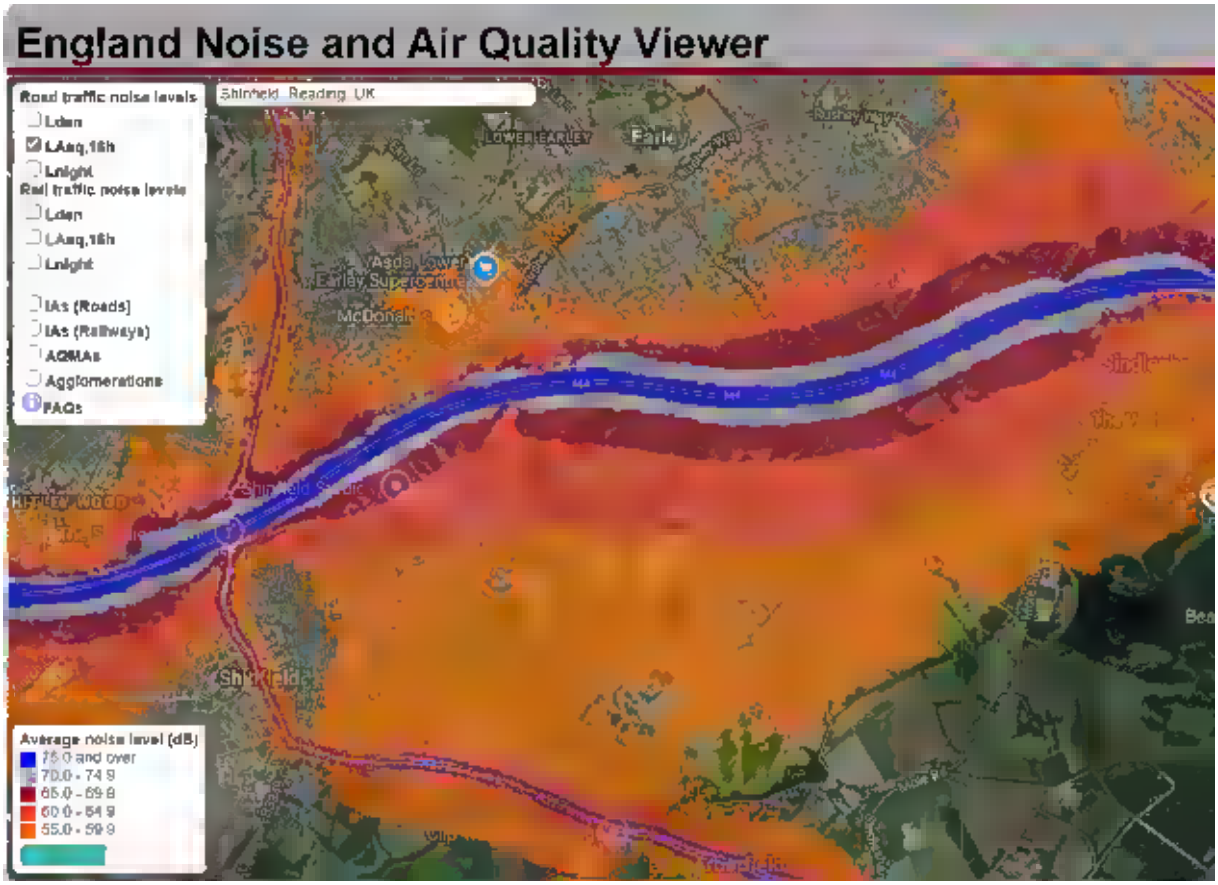

Figure A.1 Daytime noise mapping levels

Figure A.2 presents the DEFRA noise mapping across the site for the daytime period

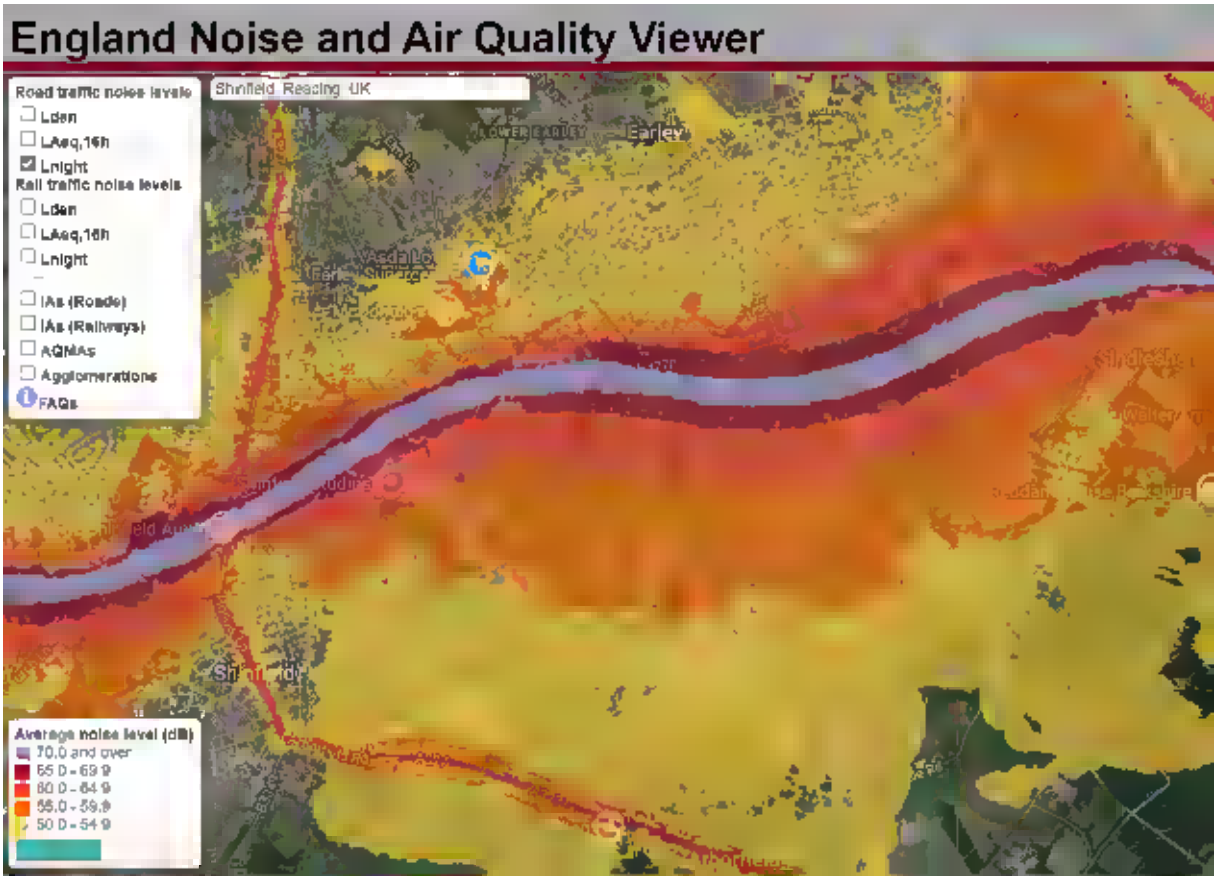

Figure A.2 Nighttime noise mapping levels

TECHNICAL PAPER

Arboricultural Statement

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Document status

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1	-	Ross Carthew	David Cox	David Cox	8 October 2024
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Contents

1 ARBORICULTURAL STATEMENT

1.1 Introduction

This document supports representations on behalf of the University of Reading ('the University') in response to Wokingham Borough Council (WBC's) Regulation 19 pre-submission consultation on the Local Plan Update (LPU), focusing on Policy SS13 which allocates the Loddon Valley Garden Village (LGV).

It should be read as part of a suite of documents submitted on behalf of the University in November 2024 including policy representations, Vision Document, and other technical reports. It should be read as a high-level summary of noise and vibration matters at a preliminary stage, i.e. prior to the formal Environmental Impact Assessment (EIA), consultation and planning application stages.

1.2 Baseline Summary

Desktop surveys / site visits have been carried out in order to feed into a strategic tree review. This provided an overview of important arboricultural features and possible statutory constraints such as ancient woodlands, veteran trees and TPOs.

General Tree and woodland cover on the land was mapped using aerial Lidar tree mapping, purchased via the National Tree Map (NTM). This mapping data has been used to inform the sites evolving masterplan.

1.3 Likely effects of the proposed development

The strategic tree review has been used inform the design of the LGV masterplan, ensuring that there are no conflicts with the identified important arboricultural features and that they have an adequate buffer around them where required. This includes significant features such as aged or ancient woodlands.

1.4 Impacts upon surrounding areas

Arboricultural speaking, the scheme should not have any material effects upon surrounding arboricultural features or assets.

1.5 Likely Mitigation Measures Required for the Proposed Development

In order to inform the future design development of the site, a full and comprehensive tree survey should be completed. The survey will adopt the guidance included within BS5837 (currently 2012, however, soon to be amended). The full tree survey will require a full digital topographical survey, in order to form the basis of the tree survey plans.

The full tree survey data will inform future masterplan design, by highlighting, accurately all the tree and woodland cover on the land. It will include all tree positions, quality assessments and root portion areas (RPA). The tree survey will include all notable, veteran and ancient trees (where present).

A detail arboricultural impact assessment will also help to guide the scheme impact upon trees, with appropriate mitigation measures included to help alleviate any potential arboreal impacts.

1.6 Compliance with existing national requirements and emerging LPU requirements

The current masterplan adheres to current national and local requirements.

There are, however, veteran trees identified near areas of proposed development and protection of these trees may need to be addressed at detail design. The LGV should be deliverable from an arboricultural standpoint. Developments will require Arboricultural Surveys in the early stages of development in line with BS5837:2012.

MAKING COMPLEX EASY

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TECHNICAL PAPER

Ground Conditions and Contamination

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1
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V1	01	Liz Williams	Philip Thomas	Philip Thomas	5 November 2024

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Philip Thomas	BSc, MSc, RoGEP, SiLC	5 November 2024

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Figures

1 TECHNICAL PAPER

1.1 Introduction

This document supports representations on behalf of the University of Reading ('the University') in response to Wokingham Borough Council (WBC's) Regulation 19 pre-submission consultation on the Local Plan Update (LPU), focusing on Policy SS13 which allocates the Loddon Garden Village (LGV).

It should be read as part of a suite of documents submitted on behalf of the University in November 2024 including policy representations, Vision Document, and other technical reports. It should be read as a high-level summary of Ground Conditions matters at a preliminary stage, i.e. prior to the formal Environmental Impact Assessment (EIA), consultation and planning application stages.

It provides a summary of the baseline conditions at the site; assesses the likely effects of the Proposed Development; and recommends the likely measures required to mitigate any identified adverse effects of the Proposed Development on human health and the environment in respect of land contamination.

The assessment will cover the evaluation of the following impacts during construction and operation of the Proposed Development, on the local environment and human health including future occupants of the Proposed Development and adjacent site users:

- Mobilisation of existing areas of contamination within soils and groundwaters causing a deterioration in groundwater and land quality.
- Existing contamination within soils and groundwaters including ground gas accumulation on human health and property.

The assessment considers relevant legislation and local planning policy including the following key provisions relevant to ground conditions and contamination:

- National Planning Policy Framework paragraphs 124, 180, 189 and 190.
- Wokingham Borough Council Local Plan Update 2023- 2040 HC5: Environmental protection and HC9: Contaminated land and water.

1.2 Baseline Summary

Summary of Previous Works

A number of assessments and ground investigations have been undertaken for the LGV development area, herein termed the Application Site, as reported within the following documents:

- RPS, Ground Conditions Desk Top Study and Preliminary Risk Assessment, University of Reading, June 2022.
- RPS, Ground Investigation and Groundwater Level Monitoring – Factual Report, land South of the M4, Shinfield, June 2023.
- RPS, Factual and Interpretative Ground Investigation Report, University of Reading Access Roads, April 2024.
- RPS, Groundwater Monitoring Addendum Report, University of Reading Access Roads Ground Investigation, August 2024.

Additionally there are a number of investigations within the Application Site that have been undertaken in support of other developments:

- CC Ground Investigations Ltd, Natural History Museum Collections and Research, Interpretative Factual Ground Investigation Report, Report Number C7638, October 2022.

- Ramboll (UK) Ltd, Natural History Museum Collections and Research. Interpretative Ground Investigation Report, Report Number 1620012379/v1, September 2022.

A summary of the information presented within the above reports is provided below.

Desk Top Study

Site History

Historical research has indicated that the Application Site has had a predominantly agricultural past land use since the 1870s, mainly fields punctuated by small areas of woodland, trackways, farms, former gravel pits and ponds. The M4 was first shown on maps of circa 1979, defining much of the northern extent of the Application Site.

Potential historical contamination sources identified from the desk based research and WBC records, included infilled gravel pits / landfill sites, sewage works / beds and off-site sources such as gas works, landfill sites and sewage works. WBC records also indicate three designated ‘gas consultation zones’ within the Application Site centred on identified former landfills.

Geology/Hydrogeology

Baseline surveys undertaken have indicated that the geology of the Application Site comprises superficial cover of Brickearth (silty clay), Alluvium (clay, silts, sand and gravel) and River Terrace Deposits (sands and gravels) associated with the River Loddon overlying bedrock strata of the London Clay Formation (clays). There is published map evidence of ‘artificial ground’ (worked ground, voids or infilled pits or quarries) in the north-east (east of Willow Pond Farm) and on either side of Julkes Lane in the east.

The geology beneath the Application Site is classified as a combination of Secondary A Aquifers (Alluvium and River Terrace Deposits), a Secondary B Aquifer (Brickearth) and unproductive strata (London Clay Formation). The closest active groundwater abstractions are in the south-west and south-east of the site for potable supply and general farming / domestic use, the former is also associated with Zone 1 and 2 groundwater source protection zones.

Available exploratory hole records from previous ground investigations have confirmed the anticipated published geological sequence in the areas investigated.

Groundwater levels were typically present in the River Terrace Deposits ranging from seepages between 2 metres below ground level (mbgl) and 4 mbgl during investigation and from 0.24 m to 4.63 mbgl during post fieldwork monitoring.

Surface Water

The nearest major surface watercourse is the River Loddon running through the centre of the Application Site in a south-west to north-east alignment. This is fed by a number of minor watercourses, drainage ditches and streams across the proposed development area. Barkham Brook, the only other major watercourse cuts through the eastern part of the Site trending approximately south-east to north-west. There are records of two active licensed surface water abstractions within 500 metres (m) of the Application Site.

Environmental Data

There are no recorded activities regulated by environmental permits or Control of Major Accident Hazards (COMAH) Regulations 1999 regulated sites within 250 m.

Seven historical landfill sites or waste treatment sites are identified on or within 250 m of the Application Site.

There have been no recorded ‘major’ or ‘significant’ pollution incidents on the site.

The Application Site is not within a radon affected area that would necessitate use of protection measures for new development.

Consultation with the Environmental Health Department at Wokingham Borough Council was undertaken in April 2022 which identified a small number of potentially contaminated sites and gas consultation zones on the Application Site. These aligned with the locations of former landfills and historical land uses on and adjacent to the Application Site.

Outline Conceptual Site Model

The outline conceptual site models (CSMs) produced upon completion of the desk studies undertaken have identified a small number of potentially active pollutant linkages that require further assessment and investigation.

The potential sources of contamination identified from the desk study research have been transposed onto a 'Ground Contamination Constraints Plan' as shown in Figure 1, below.

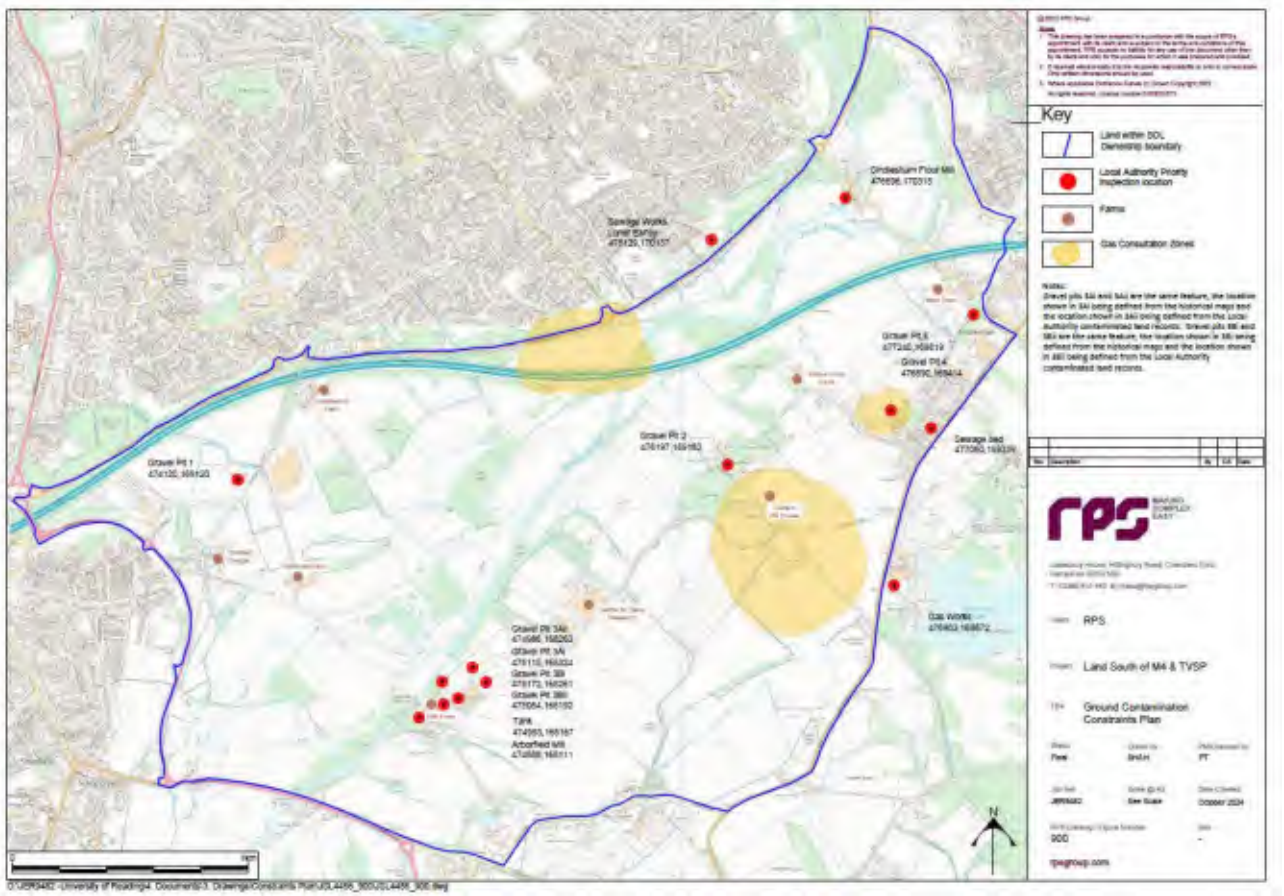

Figure 1: Constraints Plan

Some of the locations included on the constraints map have already been subject to confirmatory intrusive ground investigation, e.g. 'Gravel Pit 1' a backfilled former quarry was targeted by previous ground investigations undertaken for Shinfield Studios. This confirmed that there were no associated elevated ground gas concentrations or elevated contaminant concentrations in soil or groundwater, therefore the risk posed is minimal and this source can be discounted from further assessment.

Additional ground investigation for Hatch Farm in the north-east targeted the large area of Artificial Ground and the landfill site identified as Gravel Pit 4 on Figure 1 (gas consultation zone). This confirmed that the main area of artificial ground assumed to have been for historical gravel excavation had been backfilled with cohesive overburden and the gravel pit filled with 'inert' material materials that were not identified as

generating elevated levels of ground gas. Localised hydrocarbon contamination was identified in this location with recommendation for excavation and removal during clearance works.

Ground Investigations

RPS, Ground Investigation and Groundwater Level Monitoring – Factual Report, land South of the M4, Shinfield, June 2023

An intrusive ground investigation was undertaken in November / December 2022 with subsequent groundwater level monitoring undertake for a period of six months between December 2022 and May 2023 inclusive. The exploratory hole locations are shown in Figure 2.

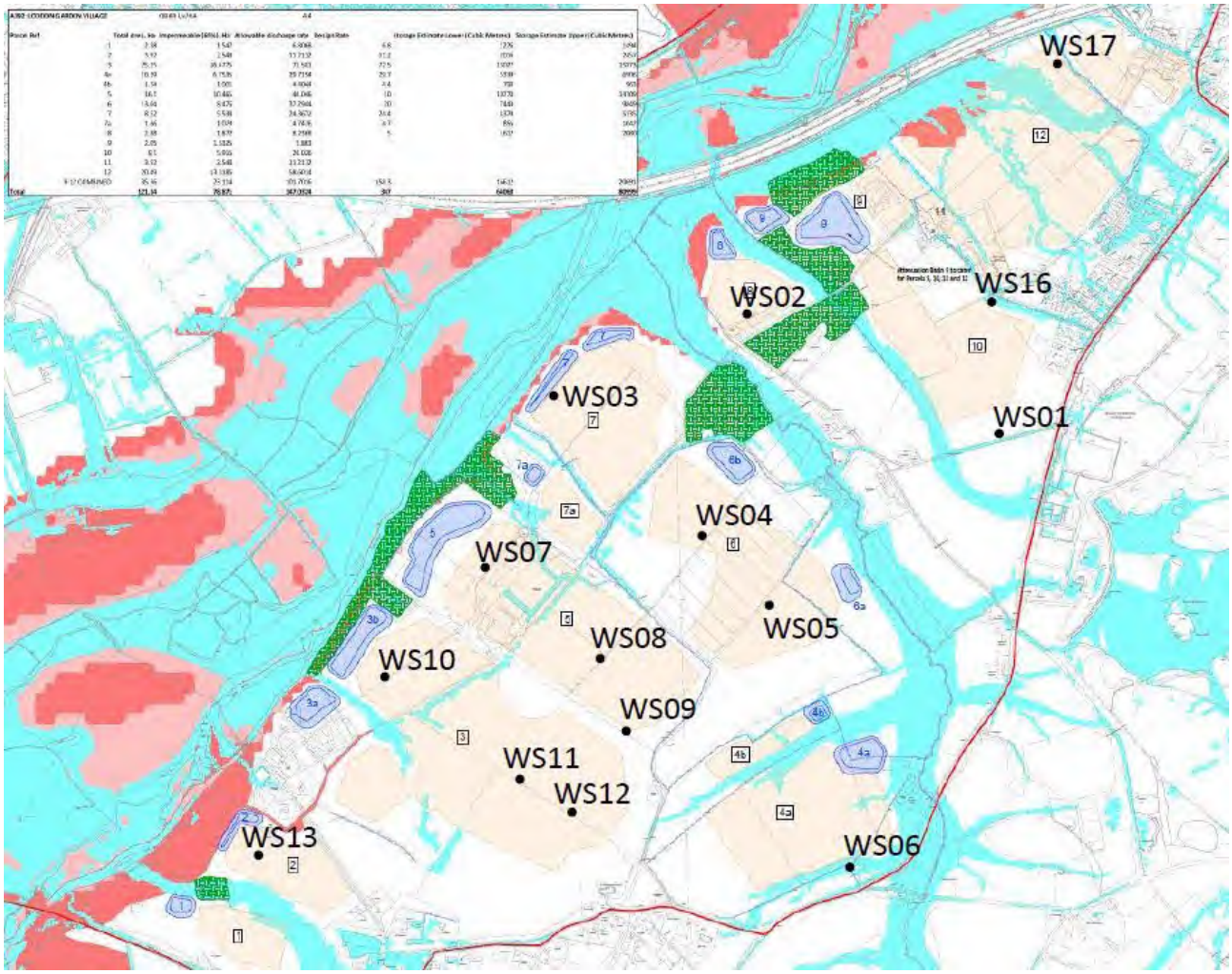

Figure 2: Site Wide Exploratory Hole Locations

Ground conditions encountered during the ground investigation works were generally consistent with that anticipated from the published geology. The following stratigraphic sequence was identified:

- Topsoil;
- River Terrace Deposits; and
- London Clay Formation

Made Ground was encountered at one location (WS05) and comprised a dark brown slightly gravelly clayey silt with rare gravel sized fragments of brick. Given that the borehole was located in an agricultural field,

These ground conditions are likely indicative of disturbed ground as a result of ploughing and other agricultural activities.

Generally, relatively shallow groundwater levels at all monitoring locations, installed in both the River Terrace Deposits and London Clay Formation, were recorded. Groundwater levels were especially high during the months of February and March 2023 with levels of 0.3 metres below ground level or less recorded in five boreholes (groundwater recorded at surface within two locations (WS05 and WS03)).

RPS, Factual and Interpretative Ground Investigation Report, University of Reading Access Roads, April 2024

An intrusive ground investigation was undertaken in February 2024 to inform design of two new access roads from the proposed Collections and Research Centre for the Natural History Museum (NHM). The exploratory hole locations are shown in Figure 3.

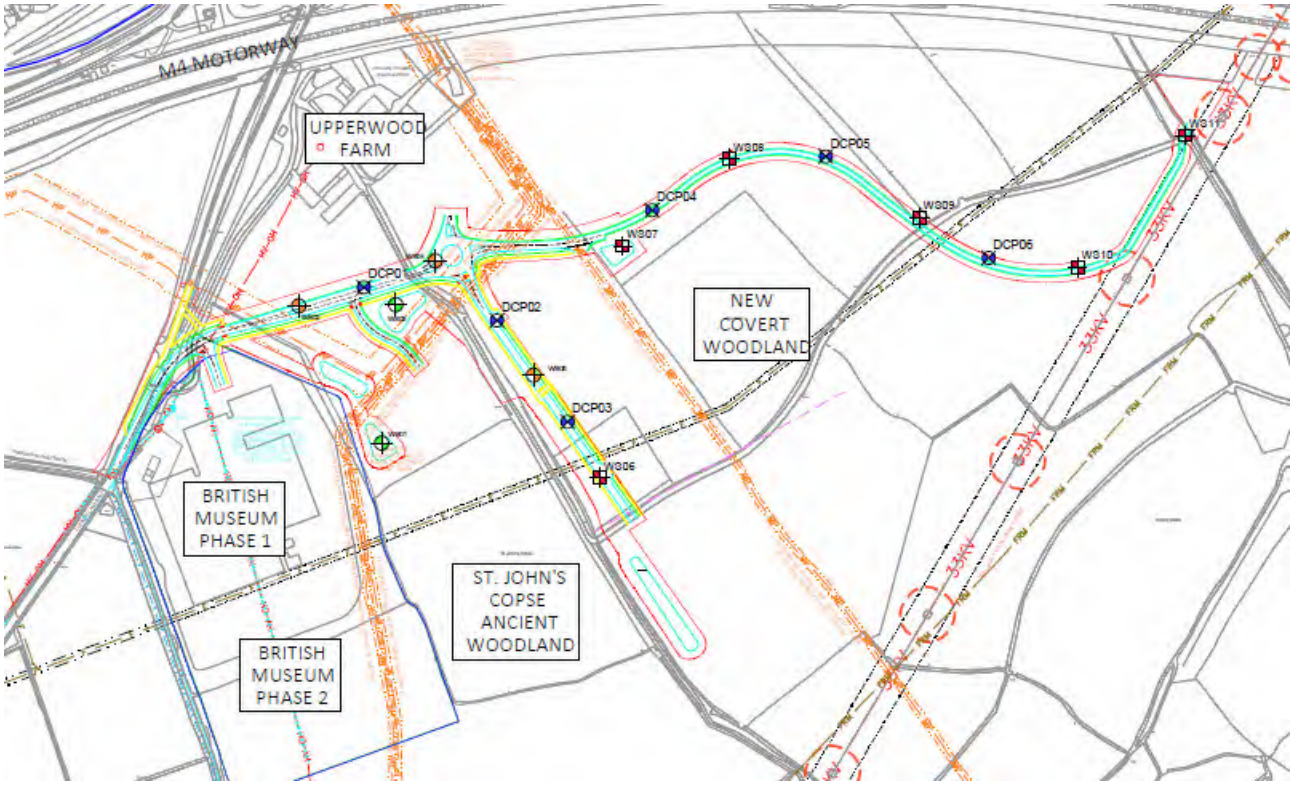

Figure 3: Access Roads Exploratory Hole Locations

Reporting of the above ground investigation also referenced a previous ground investigation reported within the following documents:

- CC Ground Investigations Ltd (October 2022). Natural History Museum Collections and Research, Interpretative Factual Ground Investigation Report. Report Number: C7638; and
- Ramboll (UK) Ltd. (September 2022). Natural History Museum Collections and Research, Interpretative Ground Investigation Report. Report Number: 1620012379/v1.

Both reports relate to ground investigation undertaken for the proposed construction of the NHM storage buildings to the south-east of the proposed roundabout and immediately east of the spur road leading south from the proposed roundabout.

The ground conditions encountered by the 2024 ground investigation generally confirmed the anticipated shallow geological sequence and were broadly consistent with the published geology and the previous ground investigations. The following superficial deposit sequence was identified:

- Topsoil;
- Brickearth; and
- River Terrace Deposits;

Made Ground was not encountered in any of the exploratory holes. The depth to bedrock was not proven during this investigation.

RPS, Groundwater Monitoring Addendum Report, University of Reading Access Roads Ground Investigation, August 2024

As part of the February 2024 intrusive ground investigation, long-term groundwater level monitoring of two boreholes (WS01 and WS03) was undertaken using data loggers. These were located in close proximity to a proposed stream culvert (WS01) and proposed surface water drainage Attenuation Basin 3 (WS03), as detailed on Figure 3.

Groundwater levels at WS03 remained stable throughout the entire period, consistently averaging less than 10 centimetres in depth over the course of the month and recorded as ‘dry’ during manual dip readings.

Groundwater levels in WS01 fluctuated, ranging from 1.49 m bgl to 2.26 m bgl and are assumed to reflect variation in rainfall patterns over the monthly period. It is evident that for the most part the groundwater level was between 1.50 m bgl and 1.70 m bgl in this borehole. Manual dip readings for the preceding month indicates rest water levels were at 1.16 to 1.21 m bgl.

As set out within section 1.4, intrusive ground investigation works are proposed to further characterise the Application Site and this will target the isolated areas of potential contamination to confirm the need for and scope of any mitigation to facilitate a safe development.

1.3 Likely Effects of the Proposed Development

The approach to this assessment has considered the land contamination risk management guidance (LCRM) (LCRM, 2020).

Recent or historical land uses at the site have resulted in localised areas of soil or groundwater contamination. That contamination is subject to potential mobilisation if disturbed. The mobilisation of contamination may result in an adverse impact on underlying aquifers, in terms of groundwater quality, the health of construction workers and adjacent site users during construction.

Construction workers and future occupants may also be exposed to existing contaminants within soils and groundwater and the accumulation of ground gas within confined spaces and buildings.

A preliminary CSM undertaken for site considered that the risks from the identified contamination sources are localised and the assigned risk levels range from low to moderate.

1.4 Likely Mitigation Measures Required for the Proposed Development

A Phase 2 ground investigation will be undertaken prior to the construction phase to investigate potential contamination sources identified by the Desk Top Study and Preliminary Risk Assessment and to verify the risk levels identified within the Conceptual Site Model.

Where contamination is identified that is assessed as presenting an unacceptable risk to receptors, a Remediation Strategy will be prepared which will comprise the following:

- Options appraisal setting out how the selected remediation option will mitigate the risks from the relevant contaminant linkages identified in the CSM;
- Implementation plan setting out the objectives and requirements of the remediation;

- Validation sampling to confirm that remediation objectives are met; and
- Verification report.

The scope of the Remediation Strategy will include all contamination remediation requirements and will be agreed with the WBC prior to its implementation. The verification report will also be sent to the WBC for approval. Subject to the scope and detail of the Remediation Strategy. Where required, detailed risk assessments will be undertaken to inform the scope of, and requirement for remediation.

Should any previously unidentified contamination be encountered at the Site during the construction phase, work in the area would cease. A suitability qualified environmental consultant would attend the Site to advise on an appropriate course of action. Details of the conditions encountered will be reported to WBC, and a suitable risk assessment and management strategy for dealing with the contamination would be submitted to these authorities for approval.

The construction process will include standard best practice measures to intercept run-off and ensure that discharges from the Application Site are controlled in quality. Specific measures to control surface water runoff will be implemented in line with a detailed Construction Environmental Management Plan (CEMP) to be implemented on a phase by phase basis.

A CL:AIRE Materials Management Plan (MMP) will be prepared prior to construction to document the management of soils on the Application Site, and include a risk assessment procedure to demonstrate that the soils do not present a risk to human health or the environment. Excavation works will be carried out in such a way to enable effective segregation of suitable materials for reuse on the Application Site wherever practicable.

During operation of the Proposed Development any plant and equipment will be appropriately sited on areas of hardstanding / within bunds, as per best practice and in and adherence to industry standards. Operational management systems and procedures will include the use of accidental spill kits. Where the handling / storage of hazardous substances is required as part of operations this will be regulated under relevant legislation including Control of Substances Hazardous to Health (COSHH).

1.5 Summary

A number of potential contaminant linkages have been identified as being potentially active upon development of the Application Site. Whilst further investigation and assessment is required prior to development, it is considered that the risks from the identified contamination sources can be addressed through standard mitigation measures that can be easily delivered through development, as evidenced by the previous investigation of these features to date.

The assessments undertaken to date and the proposed scope of work align with the national requirements and emerging Local Plan Update policies.

Implementation of the identified proposed scope of works following standard best practice and guidance will ensure land affected by contamination will be suitable for use.

Date: 09 October 2024
Project Reference 794-ENV-GDE-JER9482-AIR

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Air Quality Statement

INTRODUCTION

1.1 This document supports representations on behalf of the University of Reading ('the University') in response to Wokingham Borough Council (WBC's) Regulation 19 pre-submission consultation on the Local Plan Update (LPU), focusing on Policy SS13 which allocates the Loddon Valley Garden Village (LGV).

1.2 It should be read as part of a suite of documents submitted on behalf of the University in November 2024 including policy representations, Vision Document, and other technical reports. It should be read as a high-level summary of Air Quality matters at a preliminary stage, i.e. prior to the formal Environmental Impact Assessment (EIA), consultation and planning application stages.

1.3 It provides a summary of the baseline conditions at the proposed LGV site; appraises the likely potential effects of the Proposed Development (i.e. the proposed LGV development); and estimates the measures likely to be required to mitigate potential effects of the Proposed Development on the environment in respect of air quality.

1.4 The air quality assessment, which will be submitted alongside the planning application for the Proposed Development, will cover:

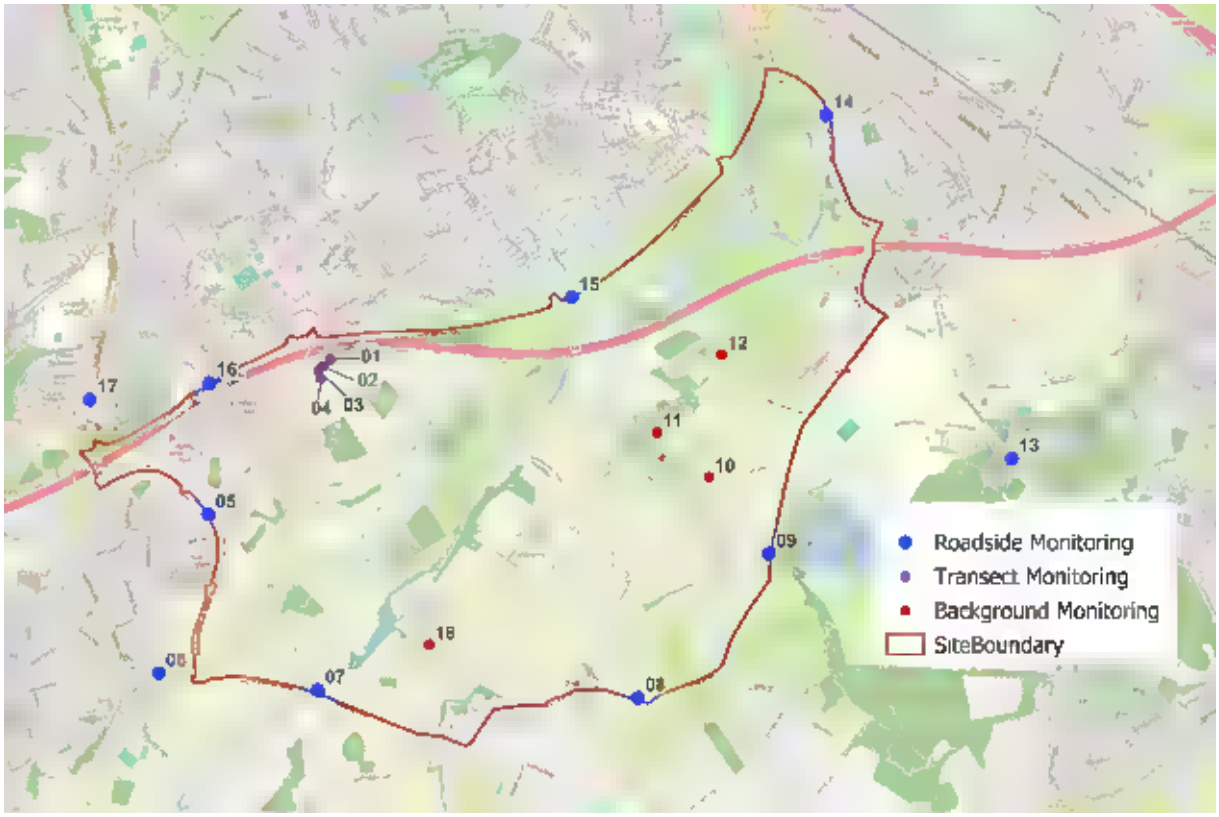
- An evaluation of the temporary effects from fugitive construction dust and construction vehicle exhaust emissions;
- An evaluation of the impacts of the development traffic on the local area once the Proposed Development is operational; and
- An evaluation of the impacts on future occupants of the Proposed Development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the Site for its proposed uses.

1.5 At this stage, an assessment of odour impacts has been scoped out of the air quality assessment as there are no known odour sources introduced by the Proposed Development. Similarly, no existing odour sources have been identified that might affect the suitability of the Site for its proposed uses.

BASELINE SUMMARY

1.6 RPS undertook a 6-month monitoring campaign from December 2022 to May 2023 to determine the existing baseline conditions within the study area (although data for May 2023 was unavailable). 18 monitoring locations were chosen, comprising of four baseline locations, ten roadside locations and four locations creating a transect leading away from the M4. Monitoring locations are shown in Figure 1.

Figure 1: Diffusion Tube Monitoring Locations



1.7 Full details relating to the monitoring campaign, including methodology and a complete results dataset, will be included within the air quality assessment for the Proposed Development.

1.8 There is the potential for existing sources of air quality pollution to affect the suitability of the site for its proposed uses. The main pollution sources likely to affect the site are:

- Emissions of NO_2, PM_{10} and $PM_{2.5}$ from road traffic on the M4 motorway and other roads within the vicinity of the site.

1.9 For this study, the existing air quality at the site has been characterised by drawing on information from the following sources:

- Diffusion tube monitoring undertaken by RPS at four background locations; and
- Defra maps[1], which show estimated pollutant concentrations across the UK in 1km grid squares.
- The Defra NO_2 Adjustment for NO_x Sector Removal Tool v8.0, used to remove impacts of the M4 within the 1km grid square.

1.10 The northern boundary of the site is close to major road links, including the M4. The area adjacent to the M4 is designated as an Air Quality Management Area (AQMA). Roadside monitoring undertaken by RPS at Location 16 (adjacent to M4 and B3270, within the AQMA) provided a raw monitored annual average NO_2 concentration of 40.35 μgm^{-3}. This data is subject to change following bias adjustment and annualisation as part of the air quality assessment. On this basis, NO_2 concentrations at the proposed receptors are likely to be below the Air Quality Strategy (AQS)[2] objective of 40 $\mu g.m^{-3}$ when taking into consideration likely standoff distances for proposed receptors from the M4. However, this will be confirmed within the air quality assessment for the Proposed Development.

1.11 Further information relating to the baseline monitoring and modelled estimates are provided in Appendix A.

LIKELY EFFECTS OF THE PROPOSED DEVELOPMENT

1.12 This assessment of the construction and operational effects of the Proposed Development on air quality will include the consideration of the effects of construction dust and traffic emissions. There is potential for the Proposed Development to worsen air quality in the surrounding area, particularly within the M4 AQMA located adjacent to the site boundary.

[1] Drawn from Defra Maps at http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

[2] Council Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe

1.13 The approach to the assessment will consider the Environmental Protection UK/Institute of Air Quality Management guidance document (EPUK/IAQM, 2017) and, where relevant, Defra's Local Air Quality Management Technical Guidance: LAQM.TG (22) (Defra, 2022).

IMPACTS ON SURROUNDING AREA

1.14 For the construction phase of the Proposed Development the key pollutant is dust, which includes PM_{10} that can have an impact on human-health and deposited dust which has fallen onto surfaces and can potentially cause temporary annoyance effects.

1.15 For the construction phase, a dust assessment will be undertaken in accordance with the IAQM *Guidance on the assessment of dust from demolition and construction* (IAQM 2024) . The IAQM dust guidance sets out 250m as the distance from the site boundary and 50m from the site traffic route(s) (up to 250m from the site entrance) from which there could potentially be nuisance dust and PM_{10} effects on human receptors. The methodology establishes the risk of impact for demolition, earthworks, construction and trackout, without any mitigation. The risk of impact is then used to determine the appropriate mitigation measures. Based on the size of the site and extent of vehicle movements generated during the construction phase, emissions of traffic-related pollutants may also have a potentially significant effect on air quality.

1.16 For the operational phase of the Proposed Development, the main air quality effect is likely to be increased concentrations of NO_2, PM_{10} and $PM_{2.5}$ from road traffic. For the operational phase, the quantitative prediction of traffic impacts on nearby AQMAs, human receptors and ecological receptors will be undertaken using the ADMS-Roads model.

1.17 Using the threshold criteria for determining when an assessment is required, set out in the EPUK/IAQM guidance alongside IAQM guidance for assessment at ecological habitat sites (A guide to the assessment of air quality impacts on designated nature conservation sites, 2020), the extent of the study area for the assessment will be determined. Receptors will be selected in locations within the study area where concentrations are already anticipated to be high and/or where concentrations are expected to change most as a consequence of the Proposed Development.

1.18 Detailed modelling of traffic emissions will be undertaken once traffic data is available and included within the air quality assessment for the Proposed Development.

LIKELY MITIGATION MEASURES REQUIRED FOR THE PROPOSED DEVELOPMENT

1.19 To reduce the impact of dust during the construction phase, mitigation measures will be derived from the IAQM dust guidance. The recommended mitigation measures are likely to be a subset of the following mitigation measures listed and will depend on the results of the risk assessment of dust impacts.

Table 1: Potential Construction Phase Mitigation measures

Communications
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
Display the head or regional office contact information.
Dust Management
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.
Site Management
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.
Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring

Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided if necessary.
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and maintaining the site
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period.
Avoid site runoff of water or mud.
Keep site fencing, barriers and scaffolding clean using wet methods.
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel
Ensure all vehicles switch off engines when stationary – no idling vehicles.
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

Operations
Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips.
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management
Avoid bonfires and burning of waste materials.
Measures specific to demolition
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
Avoid explosive blasting, using appropriate manual or mechanical alternatives.
Bag and remove any biological debris or damp down such material before demolition
Measures specific to earthworks
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
Only remove the cover in small areas during work and not all at once.
Measures specific to construction
Avoid scabbling (roughening of concrete surfaces) if possible.
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Measures specific to trackout
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
Avoid dry sweeping of large areas.
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
Record all inspections of haul routes and any subsequent action in a site log book.
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
Access gates to be located at least 10m from receptors where possible.

1.20 The following table provides a mitigation framework relevant to the operational phase of the Proposed Development. The actual nature and type of mitigation required for the Proposed Development will depend on the results of the detailed dispersion modelling of traffic related emissions (to be undertaken as part of the air quality assessment). The framework follows the IAQM Mitigation Hierarchy.

Table 2: Operational Phase Mitigation Framework

IAQM Mitigation Hierarchy			Good Practice Examples	Impact on existing receptors	Site suitability
I. Preventing or avoiding exposure/impacts to the pollutant in the first place by eliminating or isolating potential sources or by replacing sources or activities with alternatives			Making a potentially-polluting development a car-free scheme (and free from other vehicles if relevant)	✓	
			Making a potentially-polluting development a zero-emissions car/vehicle- only scheme	✓	
II. Reduction and minimisation of exposure/ impacts	Mitigation measures that act on the **source**	Measures that are designed or engineered to operate passively without	Limiting number of parking places provided for the new development	✓	
			Preferential parking for low emission or car club vehicles or graduated parking charges based on emissions	✓	

IAQM Mitigation Hierarchy			Good Practice Examples	Impact on existing receptors	Site suitability
		continual intervention	Provision of low vehicle emission infrastructure (e.g. electric vehicle charging bays, low emissions fuelling points)	✓	
			Agreement to achieve the specified emissions standards for service vehicles for the development	✓	
		Active measures that require continual intervention, management or change in people`s behaviours	Promoting and putting a car club in place at the development (to reduce absolute use and/or to give access to low-emissions vehicles e.g. electric cars)	✓	
			Development and promotion of cycle-rental schemes	✓	
			Travel plans	✓	
	Mitigation measures that act on the **pathway**	Passive measures	Scheme amended to increase the set-back distance of sensitive-use buildings from sources of pollution (e.g. a busy road)		✓
			Changes to building orientation and/or internal layout to increase effective separation distances of "habitable rooms" from air pollution sources (e.g. busy road) by placing corridors, stairwells, bathrooms, utility rooms, cellars, etc on the worst affected façade. Similarly, consider less-sensitive uses for the lower floor(s)		✓
			For mechanically-ventilated buildings, locating air-intakes away from the main source of air pollution		✓
			Changes to scheme design to avoid creating a street canyon and trapping pollutants at receptors	✓	✓
			Installation of bunds or barriers that interrupt the transport of polluted air to receptors	✓	✓
			Installing green infrastructure (e.g trees) at locations between source and receptors (caution needed to ensure dispersion not compromised)	✓	✓
	Mitigation measures at or close to the point of **receptor** exposure	Passive measures	Positioning, design and screening of outside spaces of sensitive-use buildings, e.g. gardens, balconies and roof terraces		✓
			Remove or re-locate balconies of sensitive-use buildings (especially at ground and first floors).		✓
			Building designed without indoor combustion pollutant sources that would otherwise add to occupants' exposure. For example, fit electric cookers, electric water/space heaters, or centralised/ community water/space heating.		✓
			For mechanically- ventilated buildings, fit filters for incoming air and maintain filters in accordance with European standard EN13779.		✓
			For naturally-ventilated sensitive-use buildings, consider mechanical ventilation		✓
			Installing green infrastructure (e.g. certain trees, green planting/walls and screens) at receptor locations.	✓	✓
		Active measures	Installing air-tight windows (still openable at residents' discretion)	✓	✓

IAQM Mitigation Hierarchy	Good Practice Examples	Impact on existing receptors	Site suitability
III. Off-setting a new development`s air quality impact by proportionately contributing to air quality improvements elsewhere	Contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from the new development.	✓	
	Working with the relevant planning authority or nearby property owners to identify suitable NOx and PM abatement measures off-site in the vicinity of the development.	✓	
	Contribution (can be a financial one) to help the authority develop and implement its action plan.	✓	
	Contribution to specific traffic management or road schemes.	✓	
	Contributions to local plans, related to the actual impact	✓	

SUMMARY

1.21 The main pollution sources affecting the site will include road traffic from major roads adjacent to, or within, the site.

1.22 This appraisal indicates that the existing annual-mean NO_2 concentrations at ground-level are likely to be below the AQS objective of 40 $\mu g.m^{-3}$ across the site when taking into consideration likely standoff distances between the proposed receptors and the local road network. Therefore, air quality at the site is expected to be suitable for the proposed use. However, this will be confirmed within the air quality assessment for the Proposed Development.

APPENDIX A – EXISTING AIR CONDITIONS

Overview

A.1 The existing air quality at the Application Site has been characterised by drawing on information from the following sources:

- *Diffusion tube monitoring undertaken by RPS at 4 background locations; and*
- *Defra maps [i], which show estimated pollutant concentrations across the UK in 1 km grid squares.*

A.2 Figure 1 above shows the RPS monitoring locations.

Table A.1 – Comparison of RPS Monitoring at Background Locations and Defra Mapped NO_2 Data

Monitor Name	Raw Measured NO_2 Concentration (ugm^{-3})	Defra Mapped (ugm^{-3})
RPS10	11.94	12.71
RPS11	11.34	19.07
RPS12	12.91	19.07
RPS18	12.66	12.90

A.3 Table A.2 shows the data collected during the RPS monitoring scheme.

Table A.2 – RPS Monitoring Data at Roadside and Transect Locations

Monitor Name	Raw Measured NO_2 Concentration (ugm^{-3})
RPS1	20.21
RPS2	19.59
RPS3	18.81
RPS4	18.67
RPS5	26.64
RPS6	22.92
RPS7	19.27
RPS8	13.52
RPS9	18.44
RPS13	22.64
RPS14	23.77
RPS15	27.61

Monitor Name	Raw Measured NO_2 Concentration (ugm^{-3})
RPS16	40.35
RPS17	28.19

University of Reading

November 2024

South of the M4 Strategic Development Location

Overview of delivery by the University of Reading

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South of the M4 Strategic Development Location

Overview of delivery by the University of Reading

1. Introduction

1.1. The University of Reading has a strong track record in delivering on its commitments through the planning process, which can be seen through many successful developments within Wokingham Borough and more widely. A key example of this includes their delivery of 1,350 new homes, associated strategic infrastructure and community facilities across 100 hectares of University land within the South of the M4 Strategic Development Location (SDL), immediately to the west of the Loddon Garden Village (LGV).

1.2. The South of the M4 SDL was confirmed as an allocation in the Wokingham Borough Council Core Strategy (January 2010) via Policy CP19. The allocation was for a sustainable, well designed mixed use development, to be delivered by 2026, including:

- 2,500 new homes, including affordable homes;
- employment;
- retail facilities;
- social and physical infrastructure, including up to 2 new primary schools and the expansion of existing primary provision, together with existing children's centre and youth facilities;
- Suitable Alternative Natural Green Space (SANG);
- improvements to highways capacity along the A327 and A33;
- measures to improve accessibility by non-car modes along the A327 and A33 corridors and routes to the stations at Green Park and Winnersh Triangle; and
- provision of a Park and Ride.

1.3. The University's land, known as Shinfield West, formed part of the wider SDL and in July 2010, the University submitted three planning applications to WBC for:

- up to 1200 homes;
- 150 homes for elderly persons (including sheltered housing);
- a primary school;
- community facilities including sports, a supermarket, shops and a community centre;
- a Relief Road east of Shinfield (the Eastern Relief Road); and
- a green space for public use as a SANG adjacent to the River Loddon.

1.4. Outline planning permission for the Shinfield West housing site was secured by the University in 2012 for 1,350 new homes alongside the facilities listed above.

1.5. In November 2015 the University completed the disposal of the Shinfield West housing land to a consortium of housebuilders comprising Bovis Homes, Linden Homes and Bloor Homes.

1.6. In 2015 work commenced on the delivery of the Eastern Relief Road (ERR) and its bridge over the M4 Motorway. The ERR was delivered by the University, funded by a £25m loan from the Homes and Communities Agency[1].

[1] https://archive.reading.ac.uk/news-events/2013/March/pr492370.html

2. New homes

2.1. Many of the new homes at Shinfield West are now completed and occupied, helping hundreds of people find a home in Wokingham Borough. In summary:

- **150 homes** for older residents, sheltered housing and a new primary school, predominantly being delivered by Bovis Homes, Linden Homes and Bloor Homes;
- an additional **126 homes** at Littlebrook off Cutbush Lane, ranging up from one and two bedroom apartments to five bedroom houses developed by Bellway;
- a further **126** high-quality homes delivered as Heritage Park, by Charles Church including a mix of apartments, semi-detached and detached residences have been built on the former research site operated by the National Institute for Research in Dairying (NIRD).
- **900 new homes** delivered and occupied at Spencers Wood and Three Mile Cross by Barratt David Wilson and Taylor Wimpey.

2.2. Help to Buy has been offered extensively across, alongside the provision of new affordable homes (managed by a housing association) for rent and shared ownership schemes.

3. Green spaces and environmental enhancement

3.1. Open spaces in the form of SANGs at Langley Mead, The Ridge, Mays Farm and Five Acre Field provide varied and semi-natural countryside walks and riverside views. Each SANG is linked, providing a wildlife corridor. These green spaces were brought forward alongside new development.

3.2. The University delivered and is actively involved in the management of Langley Mead, the Ridge and Strategic Greenspace between them, undertaking the creation and restoration of hedgerows to provide enhanced habitats for nesting birds, replanting of wildflower meadows and reintroduction of native species. The work has continued with the creation of new ponds and wildlife habitats for amphibians and grass snakes.

4. Community Facilities

4.1. Shinfield West, as part of the wider SDL, has delivered new schools, community facilities, play areas and shops as part of the development, supporting new and existing residents. The University delivered a new Cricket ground, pavilion and two junior football pitches at The Manor and has recently completed construction of much larger sports facilities at High Copse.

4.2. There has been new utilities infrastructure, including upgraded electrical supplies and boosted potable water supplies and increased foul drainage capacity, with longer-term needs taken into account. The University has been at the forefront of investing in this improved infrastructure.

5. Transport Improvements

5.1. Alongside new housing and community facilities, Shinfield West has delivered significant new transport infrastructure. A key feature has been the creation of the ERR that connects Reading to the north and the A327 Arborfield Road southeast of Shinfield. This provides relief for Shinfield and the A327 Black Boy overbridge of the M4 as well as access to the new Thames Valley Science Park (TVSP).

6. Transport Management

6.1. Traffic management schemes to reduce speeds and improve pedestrian crossings have been implemented along Basingstoke Road and its junction with Hyde End Road improved.

6.2. Building new homes has provided substantial new funds that have delivered public transport services. These include Mereoak Park and Ride and new bus services. These services now link the new housing and the existing villages to Reading town centre.

7. Conclusion

7.1. The University of Reading, alongside its consortium partners, have promoted and delivered a new community at Shinfield West. This includes all of the facilities, services and infrastructure needed to support the new homes.

7.2. Working with Wokingham Borough Council and Shinfield Parish Council, the University has brought forward the original Core Strategy allocation, making a significant contribution towards meeting the housing needs of Wokingham Borough.

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