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Ashfield New Settlements Study

Technical Proforma
Site 1 - Kirkby Lane/Pinxton Lane, Kirkby-in-Ashfield

Ashfield District Council

March 2021

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1. Summary

Table 1.1: Site 1 Summary Table

Site 1 Key Opportunities and Constraints	
Strategic Planning	There are a number of policy designations within and nearby the site based on the extant Adopted Local Plan (2002) including: Policy EV2 Countryside, Policy EV4: Mature Landscape Areas, Policy EV6 Nature Conservation Site, Policy EV8 Ancient Woodland that limit the developable area. Allocated employment land under Policy EM1 is located to the north (allocation EM1Sa Pinxton Lane which provides 28.0 ha of employment land). Land associated with the HS2 safeguarding area is found in the south western corner of the site.
Economics	The surrounding area of the site has attracted high-value businesses in priority sectors that generate desirable opportunities for residents. Economic opportunities on the site also have potential to reduce deprivation levels in the immediate and surrounding area. Therefore, the assessment site is considered to be attractive for future economic development.
Access and Movement	The site is located in a comparatively isolated location with few facilities within recommended walking and cycling thresholds. Some residential parts of Sutton in Ashfield and Kirkby-in-Ashfield are accessible within a 5km cycling threshold; however, most employment and retail areas are not contained within this threshold. Cycle infrastructure would be required to connect the site, particularly to Sutton Parkway and Kirkby Railway Stations. Bus stops are located along Kirkby Road, Pinxton Road (for Castlewood Business Park) and within Pinxton village. None of these bus stops lie within 800m of the site. Sutton Parkway and Kirkby-in-Ashfield Railway station are not currently accessible within recommended walking and/or cycling thresholds. No bus routes connect direct to this station. At least two access points would be required to serve 1,611 dwellings. Two access opportunities have been identified: Pinxton Lane to the north, and Kirkby Lane to the south. Pinxton Lane and Kirkby Road are both two-way single carriageway minor routes and are narrow in places. Data shows a concentration of collisions on Kirkby Lane, likely related to speed. As such, traffic calming is a suggested mitigation measure. It is likely that trips would gravitate north towards the A38 and M1, concentrating impacts on these routes. Given the M1 Junction 28 and A38 are existing locations of congestion, it is likely that any mitigation would relate to the contribution to a larger scheme, rather than a scheme specific to the proposed development site.
Ground Conditions / Geotechnical	There is considered to be a generally low to locally moderate potential risk of ground contamination. The moderate risk is limited to the location of the potentially infilled clay pit to the north of the site, historical railway north and east of the site and also the area in close proximity to mapped made ground and landfill (located adjacent to the site to the south and north, respectively). Potential on-site sources are limited but there may be made ground present which may not have originated from the site, as well as localised point sources associated with the site's agricultural use, potentially infilled clay pit and historical railway use. Historical landfills, infilled ground and shallow coal seams (on-site and off-site) may pose a potential ground gas risk.
Services / utilities location and capacity	The utilities report identified a number of affected and unaffected utilities on the site, these are discussed below. On the site visit a number of significant utilities constraints were also identified, these included overhead electrical power lines and marker posts for a below ground gas main crossing the site from north west to south east. The major risks to the development from utilities are; Existing overhead power lines (132kV) which would pose a significant constraint on the layout of the development and likely to be a significant cost to divert. Existing below ground intermediate pressure (IP) gas main which would pose significant constraint on the layout of the development, not on the same line as the O/H power line. Again, likely to be significant cost to divert. Unknown off-site reinforcement for new supplies. As while all major services are present in the area, new supplies may need off-site reinforcement to provide sufficient supply such as water supply. Sustainable energy strategy is difficult to assess given the unknown future demand for power due to changing energy supply models. In addition, there are a number of less major risks to development such as the presence of lower voltage power lines crossing the site, it is unknown whether the existing dwellings have mains gas supply, there is a three-inch cast iron potable water main within the site boundary and there are some overhead telecoms lines serving existing properties.
Drainage	There are a number of key risks to the development from flooding which include surface water flooding immediately adjacent to the existing watercourses and the requirement for significant areas of land to attenuate the flow in order minimise the risk of flooding downstream.

Site 1 Key Opportunities and Constraints

	There is a requirement for a bridge over the watercourse with a clear span to minimise the impact on surface water flood routes. The location may be constrained by the existing utilities and whether they are relocated or can be accommodated in the design of the structure.
Historic Environment	There are no designated heritage assets within the Site boundary, however, there is one Locally Listed building within the Site boundary, Cliff Farmhouse and Cart shed, which if statutorily listed may pose a threat to a potential application. In addition to this, there are a further three Locally Listed Buildings within 500m of the Site boundary. There is a slight possibility of the assets being statutorily listed however, it is not considered to present a high degree of risk. There are two Grade II Listed Buildings within a 500m study area of the Site boundary; Brookhill Hall and the associated Stable block at Brookhill Hall but it is not considered that development on the Site would undermine their significance. The nearest Scheduled Monuments are those of Pinxton Castle motte and fortified manor 800m north-west of the Site boundary, Castle Hill fortified manor 1.1km east of the site boundary, and Fishponds 220m east of St Wilfrid's Church 1.3km east of the site boundary. There are no conservation areas within the Site boundary, the nearest is Kirkby Cross Conservation Area which was adopted by Ashfield District Council in September 2004. Development to the north of the B6019 Kirkby Lane will change the setting of Kirkby Cross Conservation Area as it is approached from the west however, it is not considered that the change in setting will diminish the area's significance. The Site is not within the setting of the three scheduled monuments located within the conservation area.
Landscape	The site area is elevated, with some long views to the south. It has a low landscape sensitivity yet a medium visual sensitivity owing to the long views available to the south from the eastern edge of the site, as well as from the north west across the site. The woodland running through the northern half of the site forms part of a local wildlife site, however there are few other conservation interests within the surrounding context and therefore has a low landscape sensitivity. The areas to the north, east and west of the site are relatively built up, with some industrial and commercial areas present. Therefore, development of the site has the potential to result in perceived sprawl, particularly to the south-east of the site. Kirkby Lane and Pinxton Lane both form defensible boundaries, as does the dismantled railway line. The rest of the site edges are formed by field boundaries. The site is potentially suitable on landscape grounds, however a landscape buffer is recommended in the far south-eastern corner of the site, where the more open views are located. It would be desirable to retain the green corridor associated with The Dumbles within any new development.
Social Infrastructure	On-site provision costs: • Two 50-place nurseries • 2FE Primary School Off-site Contribution costs: • 2FE Secondary School provision • Acute healthcare provision • Indoor sports provision • Outdoor sports provision To be confirmed on-site/off-site: • 2GP Primary Healthcare Facility • 40 unit extra care accommodation • 400 sqm multi use community facility • 4.7ha outdoor sports
Lighting	It is not anticipated that special constraints apply to the Site beyond incorporating good practice measures and thoughtful design into strategies for new lighting to control obtrusive effects such as light spill, sky glow and glare.
Site capacity	The site capacity has been estimated at 1,611 dwellings.
Deliverability and implementation	The site is in multiple land ownership and the availability of northern parcels is currently unknown. Site 1 is generally unviable. It is only shown as viable when using the BCIS lower quartile constructions costs, assuming 0-5% affordable housing level and £0 to £5,000/unit in planning obligations.

2. Detailed site and locality descriptions

2.1 Site location and setting

The site is strategically located south west of the Sutton in Ashfield and west of Kirkby-in-Ashfield with the A38 and M1 providing links with Mansfield, Alfreton and Nottingham. The site is in an unparished area with the smaller settlement of Pinxton to the west. The site is in close proximity to two large employment areas, Castlewood Business Park and South Fulwood Industrial Estate. The outer surroundings of the site are largely urban, however, the more immediate surroundings to the site are mostly agricultural fields and buildings.

Figure 2.1: View from site at Kirkby Lane

Figure 2.2: View from Pinxton Lane

Figure 2.3: View south away from site at Kirkby Lane

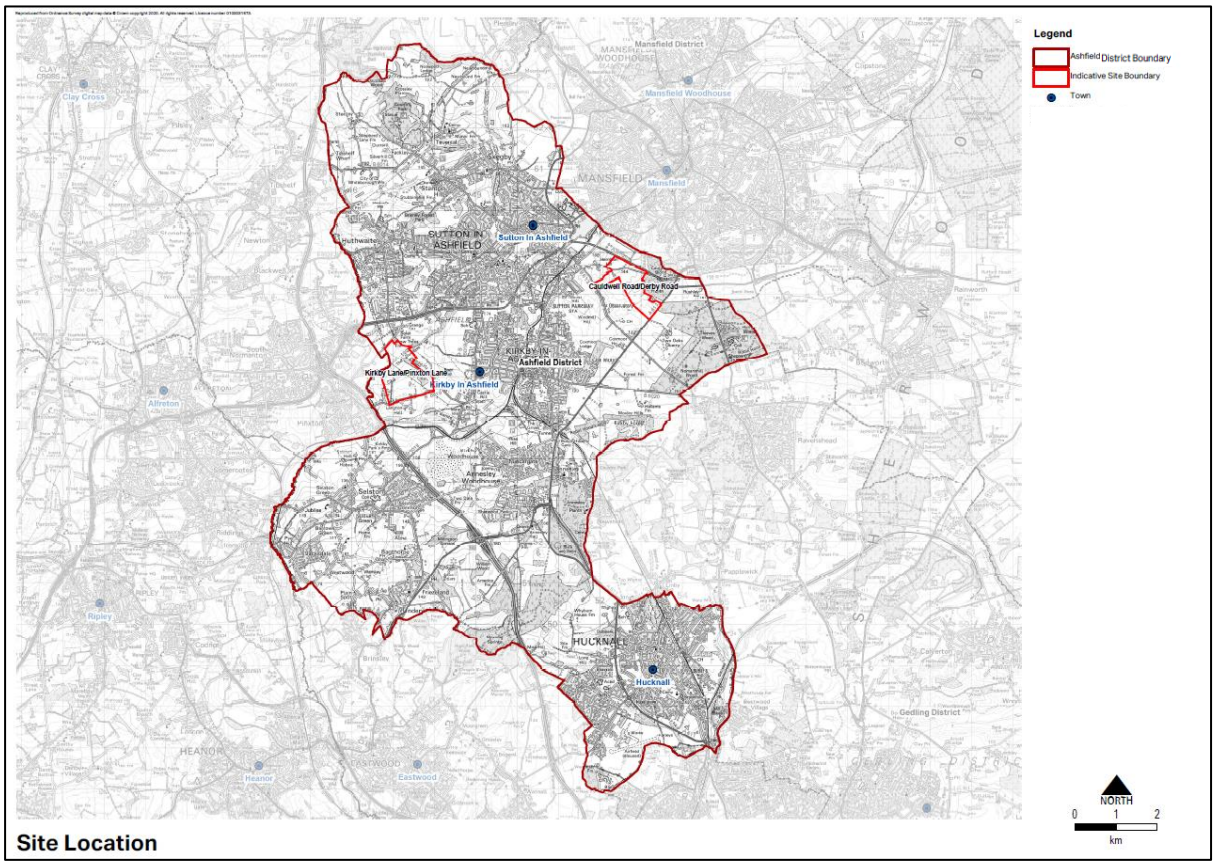


Figure 2.4: Location of the two new settlement options in Ashfield District

Figure 2.5: Location of Site 1 - Kirkby Lane / Pinxton Lane, Kirkby-in-Ashfield

Kirkby Lane/Pinxton Lane, Kirkby-in-Ashfield (Site 1) is located to the west of Kirkby-in-Ashfield. It covers approximately 117 hectares and has an initial estimated capacity of 1,611 dwellings (subject to further testing). The approximate centre of the site is at reference 447277, 356139.

2.2 Site ownership

The site is currently split into 9 parcels of land with 6 different landowners, as shown in **Figure 2.6**. Of these 9 parcels of land a total of 5 SHELAA Call for Sites forms have been submitted, covering the majority of the site south of The Dumbles and north of Kirkby Lane. All parcels of land which have come forward through the Call for Sites submissions are for a mix of housing and employment apart from one (KA045) which has been submitted for employment only. Call for Sites submission KA041 land is currently tenanted by Buntings (Agri) Limited, however the landowner is also a director.

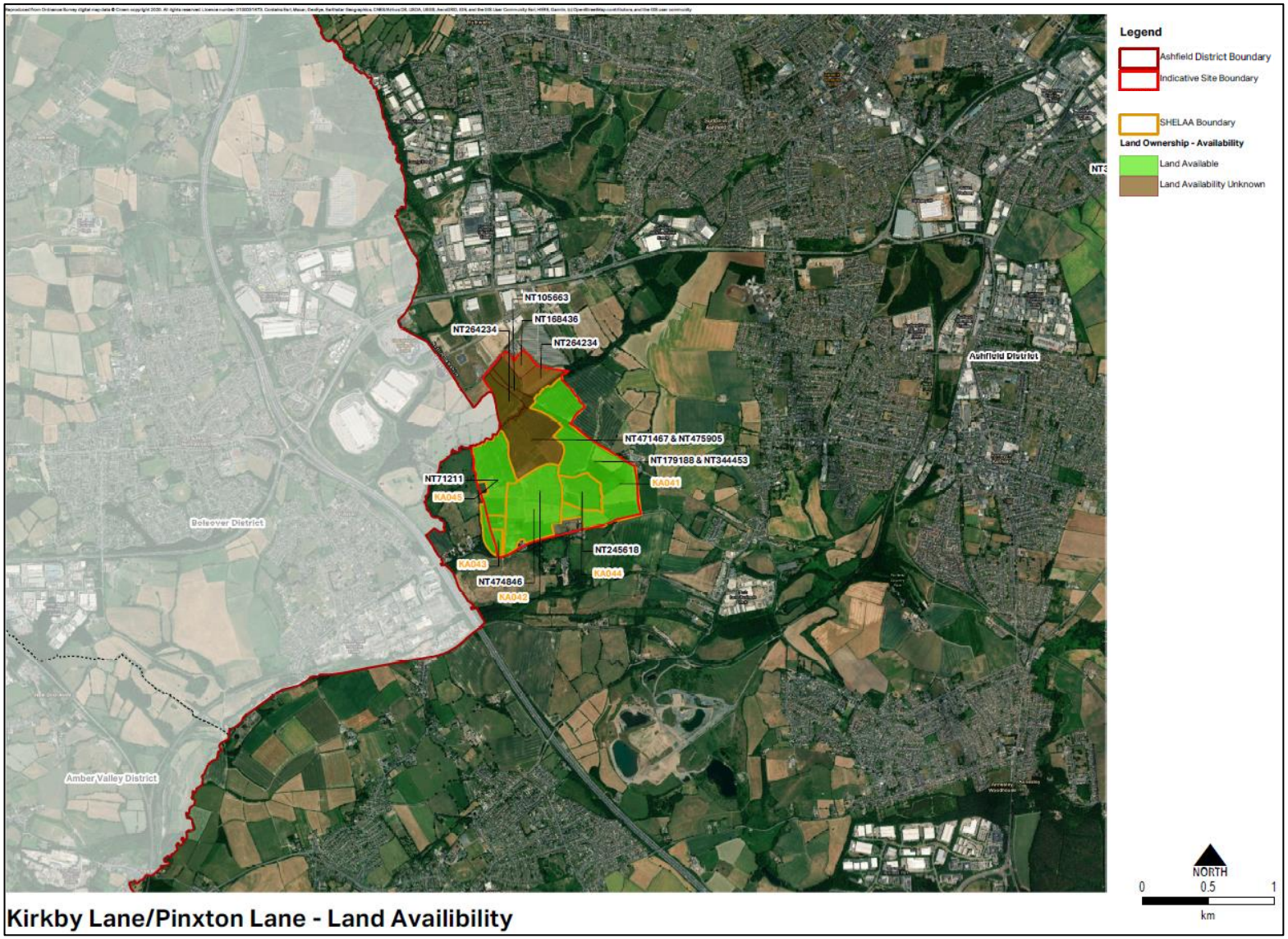


Figure 2.6: Site 1 Land ownership and availability

2.3 Existing boundaries

The north western boundary follows Pinxton Lane, which is the proposed access for the site, for approximately 200m before it skirts around the edge of existing agricultural/ light industrial buildings. The northern boundary then follows the line of Crow Solar Farm field before reaching an area of woodland. The boundary then turns towards the south, resulting in the eastern boundary following the pattern of agricultural fields before reaching the unmade road where Buntings Agricultural Services is located. The boundary follows this road to the B6019. The southern boundary follows the B6019/ Kirkby Lane for approximately 1.1 km before turning north just to the west of Cliff Lane. The western boundary then follows a straight line, cutting through the middle of a number of agricultural fields until it reaches an area of woodland and a watercourse at The Dumbles. It then follows the woodland towards the east until it reaches the Public Right of Way north of Mawkin Lane, which it then follows to meet back at Pinxton Lane.

2.4 Topography

The site is gently undulating from north-south with the southern part of the site forming a minor north east to south west ridgeline between The Dumbles (that crosses the site from north east to south west) and the River Erewash further to the south (along broadly the same alignment). The high point of the site is north east or Cliff Lane.

2.5 Site uses

The existing land use within the site includes three dwellings, the first is a three bedroom farmhouse located to the west of Cliff Lane, the second is located along the southern boundary of the site, slightly east from Cliff Lane and the third is located in the south eastern section of the site.

In addition, there are a number of dispersed clusters of agricultural buildings and/or light industrial units within the site and to the south of the site east of Cliff Lane there is a dog walking facility.

The majority of the site is made up of a patchwork of agricultural fields in multiple ownership, primarily arable uses, which are defined by well-established hedgerows, treelines, watercourses and public rights of way, including nine within the site and a further five immediately outside the boundary. In the centre of the site there is an area of Deciduous Woodland.

2.6 Surrounding land uses

There are a number of land uses adjacent to the site. The immediate surrounding uses of the site mainly consist of agricultural fields and associated buildings.

The western boundary is formed by the safeguarded route alignment for HS2 which whilst not currently operational is planned for construction and operation during the Local Plan period.

An employment area, Castlewood Business Park, adjoins the north western boundary of the site and beyond this there are further employment uses and a shopping centre, the East Midlands Designer Outlet. In addition, to the north of the A38 there is a large area in light industrial use. Crow Solar Farm is located directly adjacent to the northern boundary and next to this is Midland Aerospace Ltd.

Land uses which are not directly adjacent to the site include the road network accommodating the M1 and the A38, fairly extensive employment areas and residential use. Brookhill and Wharf Road Industrial estates are located approximately 1km south west of the site, Kirkby-in-Ashfield is located approximately 1.5km east of the site which is considered one of Ashfields main urban areas and has a number of services and facilities. In addition, Pinxton is located approximately 1.5km west of the site.

2.7 Roads and access arrangements

In terms of the strategic road network, the site is located east of the M1 motorway and south of the A38. In terms of the immediate local highway network, Pinxton Lane to the north of the site is a narrow two-way single carriageway road. To the south of the site, Kirkby Lane connects Pinxton with the B6018 (which provides subsequent connection to Kirkby-in-Ashfield).

There are two existing points of access for this site, Pinxton Lane and the B6019. A potential access for the site is off Pinxton Lane to the north, however not all of the land along the northern boundary along Pinxton Lane has

been confirmed as available by the landowners. All land that is currently considered to be available is accessed from B6019 to the south. There are three established access roads off Kirkby Lane, serving existing agricultural buildings including Kirkby Cliff Farm which is accessed from an unmade road (Cliff Lane) off the B6019.

The nearest railway station to the site is Kirkby-in-Ashfield railway station, which lies 3km to the east of the centre of the site as the crow flies. Sutton Parkway Station lies 3.75km northeast of the site as the crow flies. Both stations lie on the Robin Hood Line, which connects Nottingham to Worksop. The towns and villages served by the route are Nottingham, Bulwell, Hucknall, Newstead, Kirkby-in-Ashfield, Sutton in Ashfield, Mansfield, Mansfield Woodhouse, Shirebrook, Langwith, Nether Langwith and Whaley Thorns, Cresswell, Whitwell and Worksop.

The B6019 has a two bus routes serving it, linking the site to Sutton in Ashfield and Mansfield to the north east and Ripley and Derby to the south west. There are no direct bus services linking the site with Kirkby-in-Ashfield railway station.

3. Planning overview

3.1 Existing reports / information referred to

- National Planning Policy Framework (2019);
- Planning Practice Guidance (2020);
- Ashfield Local Plan Review (2002) and adopted Policies Map; and
- HS2 safeguarding area Phase 2b.

3.2 National Planning Policy Summary

The new National Planning Policy Framework (NPPF) was published in February 2019. It sets out the Government's economic, environmental and social planning policies for England and how these should be applied. Given the lack and outdated nature of local planning policy in the Ashfield context, the guidance set out in the NPPF will be the primary consideration.

At the heart of the NPPF is a presumption in favour of sustainable development that should run through both place-making and decision-taking. NPPF Paragraph 11 states that, for plan-making, this means that:

a. plans should positively seek opportunities to meet the development needs of their area, and be sufficiently flexible to adapt to rapid change;

b. strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas, unless:

   i. the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of development in the plan area[6]; or

   ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.

Footnote 6 to paragraph 11 a) i. states "*the policies referred to are those in this Framework (rather than those in development plans) relating to: habitats sites (and those sites listed in paragraph 176) and/or designated as Sites of Special Scientific Interest; land designated as Green Belt, Local Green Space, an Area of Outstanding Natural Beauty, a National Park (or within the Broads Authority) or defined as Heritage Coast; irreplaceable habitats; designated heritage assets (and other heritage assets of archaeological interest referred to in footnote 63); and areas at risk of flooding or coastal change*". It should be noted that "irreplaceable habitats" refers to Ancient Woodland and ancient or veteran trees. The constraints listed in Footnote 6 are significant constraints to development under the NPPF.

For proposals affecting heritage assets the NPPF at Paragraph 189 requires applicants to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

NPPF 193 states that when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

Paragraph 194 states that any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of grade II listed buildings, or grade II registered parks or gardens, should be

exceptional; whilst assets of the highest significance (notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites) should be wholly exceptional.

With regards to minerals the NPPF states that since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation. Planning policies should safeguard mineral resources through Minerals Safeguarding Areas and authorities should adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development. Policies should be set out to encourage the prior extraction of minerals where practical and environment; however, in respect of coal NPPF paragraph 211 states that planning permission should not be granted for the extraction of coal unless:

a. the proposal is environmentally acceptable, or can be made so by planning conditions or obligations; or

b. if it is not environmentally acceptable, then it provides national, local or community benefits which clearly outweigh its likely impacts (taking all relevant matters into account, including any residual environmental impacts).

With respect to ground conditions and pollution NPPF Paragraph 180 states that planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

c. mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

d. identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

e. limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

The government has published safeguarding information for the HS2 route to prevent planning decisions and development from potentially impacting or preventing the route from coming forward. On 6 June 2019 the Secretary of State issued revised safeguarding directions for Phase 2b, the phase which runs through Ashfield District, which replaces all previous versions. The Phase 2b safeguarding maps: Nottinghamshire, Derbyshire and Nottingham[1] shows that the south-western triangle of land at Site 1 (north of Kirkby Lane and west of Cliff Lane) is within the safeguarded area. The rest of the safeguarding area forms the western boundary of Site 1.

3.3 Local planning policy summary

The Ashfield Local Plan Review (2002)[2] sets out a framework of policies to guide and encourage development in Ashfield up to 2011, whilst safeguarding and enhancing the environment. In 2007 a series of these policies were 'saved', the ones relevant to the site and surroundings are outlined below. An extract of the Proposals Map[3] is presented at **Figure 3.1** with the Site 2 boundary annotated to show the relevant policies that apply to the site.

There are four designations on the adopted policies map which are within the site boundary, the first is **Policy EV2 Countryside,** the whole site area is covered by this policy. This policy states that permission will only be given for appropriate development. Development must be located and designated so as not to adversely affect the character of the countryside, in particular its openness. The policy lists what 'appropriate development' would comprise including rural uses, outdoor sport or recreation, cemeteries and utility installations, buildings which are essential for uses appropriate to the countryside, re-use of existing buildings, replacement, alternation or extension of existing buildings, infill development and within named villages.

[1] Available at: https://www.gov.uk/government/publications/hs2-phase-2b-safeguarding-maps-nottinghamshire-derbyshire-nottingham
[2] Available at: https://www.ashfield.gov.uk/media/2358/full-document-_text_.pdf
[3] See Page 9 of the map book, drawing SG-02-222, available at: https://www.ashfield.gov.uk/media/2359/lplan-proposals-map-north.pdf

The second designation is **Policy EV4: Mature Landscape Areas,** which states that development which does not adversely affect the character and quality of mature landscape areas will be permitted. EV4Rj 'Dumbles' is located within the site as a linear corridor, with a larger area outside of the site to the south west.

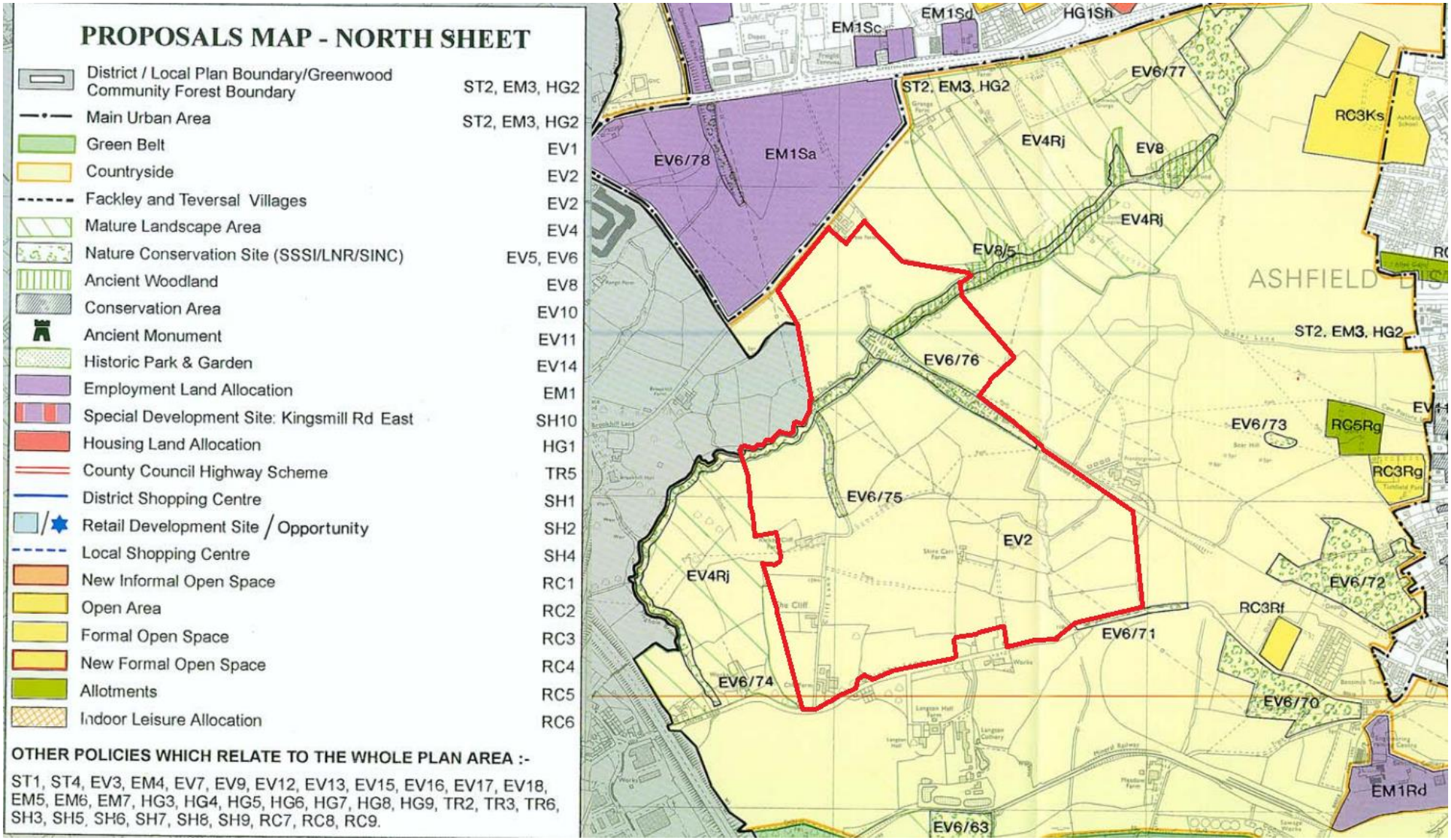


Figure 3.1: Local Plan 2002 Policies Map Extract (Site 1 boundary annotated in red)

The third designation is **Policy EV6: Nature Conservation Site,** for which the policy states that development which adversely impacts local nature reserves will only be permitted where provision is made within the development for the protection of features of nature conservation or geological significance or where the development cannot be located elsewhere. There are five of these conservation sites located within the site boundary, these are;

- EV6/71 Pinxton Lane Verge, a roadside verge supporting an interesting flora;
- EV6/74 Maghole Brook and Ashfield Dumble, a stream and dumble with their associated woodland and sections of interesting ground flora;
- EV6/75 Mawkin Lane, a green path with a notable community;
- EV6/76B Frandergound Farm Disused Railway, a wooded disused railway with a notable flora; and
- EV6/76G Pinxton Lane Railway Cutting, a rare exposure of oil rich shales from Middle Coal Measures.

Lastly the site contains an area of **Policy EV8: Ancient Woodland**, this is a thin strip of woodland in the north of the site: EV8/5 'The Dumbles' . The policy states that development which adversely affects trees worthy of retention, including woodland and individual trees, will not be permitted. Where trees are lost as a result of development, replacement or mitigating planting will be required.

The site is directly adjacent to **EM1 Employment Land Allocations** allocation EM1Sa Pinxton Lane which provides 28.0 ha of land. The policy wording states "*Land at Pinxton Lane (EM1Sa) is well located to take advantage of fast road links to the M1 and is of a size that will offer significant opportunities for large scale employers and inward investors particularly as the Sherwood Business Park nears completion. The site is suitable for development as a prestige employment site in accordance with Structure Plan Review Policy 2/6"*. The site is now complete and is called Castlewood Business Park.

The other main policy document that applies to the site is the Minerals Local Plan. The emerging Minerals Local Plan is currently undergoing Examination in Public and is at an advanced stage. The Policies Map for the Publication Version of the Minerals Local Plan[4] shows that the majority of the site is within a Minerals Consultation Area and Minerals Safeguarding Area for surface coal, covered by **Policy SP7 Minerals Safeguarding, Consultation Areas and Associated Minerals Infrastructure.** Under this policy non-minerals development within minerals safeguarding areas will have to demonstrate that mineral resources of economic importance will not be needlessly sterilised as a result of the development the development and that the development would not pose a serious hindrance to future extraction in the vicinity. Where this cannot be demonstrated, and where there is a clear and demonstrable need for the non-minerals development, prior extraction will be sought where practicable.

3.4 Planning history summary

Planning Application Ref V/1988/0364 for the Opencast Extraction of Coal and Recovery of Ash, Including Reclamation of Railway Land was refused in October 1998. The application was then dismissed at appeal in July 1989.

Planning Application Ref V/2019/0183 for the change of use of agricultural buildings and agricultural land to enclosed training, dog walking and exercising of canines at Cliff Farm, Cliff Lane, Pinxton (approved 16/05/2019).

[4] Available at: https://www.nottinghamshire.gov.uk/media/2327747/sd1-mlp-publication-version.pdf

4. Economics

4.1 Existing reports / information referred to

This analysis has identified the baseline conditions surrounding each assessment site, the main drivers for economic growth in the area and any planned schemes that may unlock growth; in order to robustly assess the attractiveness of the site for employers and its suitability for development. This assessment has been established following a comprehensive review of publicly available data sources and strategic local documents including:

- Office of National Statistics (ONS) Population Estimates and Projections;
- ONS Business Register and Employment Survey (BRES);
- ONS Annual Population Survey;
- ONS Census 2011 Workplace and Origin-Destination data;
- Ministry of Housing, Communities and Local Government's Index of Multiple Deprivation (IMD)
- The Strategic Economic Plan (SEP) for the Derby, Derbyshire, Nottingham and Nottinghamshire (D2N2) Local Enterprise Partnership (LEP);
- D2N2's Evidence Base for the Local Industrial Strategy; and
- D2N2's Science and Innovation Audit.

Based on this review, the three Science and Innovation Core priority sectors for the LEP were recognised as: transport equipment manufacturing, food and drink manufacturing and life sciences. These sectors present a major opportunity for future growth due to the existing competitive advantages the area has against the rest of the country. In addition to this, Opportunity priority sectors within the LEP include creative and digital, visitor economy, logistics and e-commerce, construction, extractive industries, and professional and business services. Retail and healthcare are also included due to their high-volume of employment.

Nearby employment sites in the priority sectors present economic development opportunities for the assessment sites due to their potential agglomeration benefits and business connectivity advantages thus, increase the attractiveness of the site.

4.2 Detailed overview

The Kirkby Lane/Pinxton Lane assessment site is extremely well-connected to the strategic road network due to its location immediately off Junction 28 of the M1 and its accessibility to the A38. This road connectivity is a strength for any future development on the site, connecting residents to other centres and providing businesses with access to an enhanced labour market and supply chain. Accessibility is key for most economic sectors but is particularly vital to the priority manufacturing sectors and the logistics opportunity sector.

Although the current site is rural, the surrounding area has a high employment density with good-quality employment opportunities. The Lower Super Output Areas (LSOAs) in which the site falls have an employment density of 1.05, above the borough and LEP averages – both of which are 0.70[5][6]. The employment in the surrounding area is led by the borough's important manufacturing sector, contributing 26.5% of jobs. Therefore, the manufacturing sector in the immediate area generates a larger proportion of employment than across Ashfield (18.2%) and LEP (13.1%), despite the important manufacturing sectors in both geographies. The D2N2 LEP has identified the transport manufacturing sector specifically as one of the three core priority sectors. Major employment sites in the area such as South Fulwood Industrial Estate and Sherwood Business Park have attracted clusters of crucial businesses in this sector, capitalising on their instant access to the M1.

Swiftool Precision Engineering, specialising in critical parts for aerospace markets, is located amongst the cluster of business around South Fulwood Industrial Estate to the north of the site and has been identified in the SEP as one the fastest growing scale-ups in the LEP area[7]. Midland Aerospace is also positioned in this cluster by the M1, recognised as an important facility by the Science and Innovation Audit[8]. Sherwood Business Park to the south contains Rolls-Royce and Standard Motor Products Europe, both top performing companies in the LEP's

[5] Office of National Statistics (ONS), (2019); Population Estimates 2018 (16-64)
[6] ONS, (2019); Business Register and Employment Survey
[7] D2N2, (2019); Strategic Economic Plan
[8] D2N2 LEP (produced by SQW), (2018); A Science and Innovation Audit for the D2N2 Local Enterprise Partnership

priority sector[9], whilst the assessment site is well-connected to the Brookhill Industrial Estate manufacturing cluster along Kirkby Lane. The presence of these clusters of regionally or nationally recognised businesses in the locality and the M1 accessibility creates opportunities for future development to host further manufacturing activity and complement existing assets in the LEP's high-value priority sector. Any housing in the new settlement would bring a new resident base near to important employment prospects.

Development on the site could also connect to existing assets in the LEP's food and drink priority sector, with a cluster of activity located along the A38 by Alfreton. Thornton's is Britain's largest chocolate maker and all their UK manufacturing, packing, distribution and warehouse operations are based at Thornton Park – supporting over 3,500 jobs[10]. Griffith Foods is located at Cotes Park Estate and further establishes the strength. Although Ashfield itself does not have a substantial presence in the sector, these assets in the locality demonstrate the area has an ability to attract and develop major employers through its labour market and connectivity.

In addition to the manufacturing, the surrounding area to the assessment site has a reliance on the construction sector – considered an opportunity for D2N2 due to its clusters of activity, high employment generation and projected growth. Construction activities generate 22.5% of employment in the site's LSOAs, considerably above the borough (9.1%) average. These activities are focussed in locations adjacent to the assessment site, such as Park Lane Business Park and sites along Kirkby Lane containing construction companies Collins Earthworks Ltd, Bentinck Fencing and Van Elle. Therefore, the construction of any development could benefit local businesses whilst the operational development could provide labour to these companies.

Utilising the Census 2011 workplace data, it has been identified that the site's LSOAs attract a workforce slightly more qualified than the borough average – although it is worth noting that the skills profile in the borough lags regional and national levels[11]. In 2011, 27.9% of the workers in the site's LSOAs were qualified to NVQ Level 4 or above – greater than the borough average at the time (25.6%)[12]. In addition, 37.5% of workers occupied high-level occupations (level 1-3) compared to the borough average of 33.5% and D2N2 LEP average of 36.2%. These statistics suggest the surrounding area is generating strong employment opportunities and thus, attracting a more skilled workforce than elsewhere in Ashfield.

The Index of Multiple Deprivation[13] ranks the site's LSOAs in the 4th and 6th deprivation deciles (1st is most deprived. A new settlement on the site, therefore, has some immediate regeneration potential as a portion of the site is currently considered to be in the 40% most deprived parts of the country. In addition, the LSOA adjacent to the site in Pinxton and multiple LSOAs around Kirkby-in-Ashfield are all judged to be in the 20% most deprived parts of the country. This means there is also wider regeneration potential for neighbouring areas.

The above analysis indicates the surrounding area has attracted high-value businesses in priority sectors that generate desirable opportunities for residents. Therefore, the site appears attractive to employers and future development, particularly as the M1 road accessibility is conducive to these priority sectors. Economic opportunities on the site also have potential to reduce deprivation levels in the immediate and surrounding area.

4.3 Risks

The surrounding area is currently not densely populated in terms of housing. Of the population in the area, the proportion of residents that are working age (60.3%) is below the borough (61.9%) and LEP (62.7%) averages[14]. Therefore, there is not an extensive existing labour force in the area for businesses to recruit from. This potential issue is shown by the proportion of workers in the area that live within 5km of their workplace (35.6%) is below the borough (37.4%) and LEP average (38.5%). Despite this, the collection of major businesses in the area are evidence that companies are finding a suitable workforce for their growing operations, with a slightly higher proportion of workers in the site's LSOAs also residing in Ashfield than the average for the borough[15].

The nearest train station is located in Kirkby-in-Ashfield, around two kilometres east of the assessment. Although the proximity to the station does provide rail connectivity, the distance may deter workers from travelling to the site's business activities by train. There is a risk this could prevent businesses from locating on the site, if they needed to draw in a specialised workforce or require immediate rail connectivity for their operations.

[9] D2N2 LEP, (2019); D2N2 Local Industrial Strategy Evidence Base v1.7 (including consultation feedback)
[10] Figured supplied by a report on Thornton's Website
[11] ONS, (2019); Annual Population Survey
[12] ONS, (2015); Census 2011 Workplace Population Statistics
[13] Ministry of Housing, Communities and Local Government, (2019); English Indices of deprivation 2019
[14] ONS, (2019); Population Estimates 2018
[15] ONS, (2015); Census 2011 Origin-Destination Statistics

Although the nearby construction businesses are positive for development in some respects, such as supporting local businesses, there is a risk these existing operations are not complimentary to certain sectors or future housing developments.

4.4 Proposed mitigation solution

The lack of housing in the immediate vicinity and lower proportion of working-age residents has not prevented multiple major businesses from succeeding in the area. In addition, a future settlement on the site would comprise varied, high-quality housing within the development, thus bringing a new active workforce to the area. The new residents would support future and existing business operations whilst allowing residents to potentially live close to their place of work.

The road connectivity in the area is the major transport asset for the site. Operations in the area typically utilise the M1 accessibility for their operations and supply chain, with activities in manufacturing and construction. The train station in Kirkby-in-Ashfield is an opportunity for new settlements, but the opportunity needs some stimulation. To provide workers with a public transport route to work and help attract businesses, bus routes should be considered to connect the site to the train station in Kirkby-in-Ashfield. This linkage would also help overcome any issues from skill shortages experienced across Ashfield.

The nearby construction activities are not considered to be of the scale or proximity that would deter prospective residents from the occupying the housing or businesses from occupying the employment floorspace. The layout of the settlement could be designed to ensure any incompatible uses are not parallel.

Therefore, the assessment site is considered to be attractive for future economic development. Businesses are likely to have opportunities in the LEP's priority or identified sectors whilst residents would be brought closer to existing economic assets in the LEP's documents.

5. Access and movement

5.1 Existing reports / information referred to

This section has been prepared using the following documents:

- National Planning Policy Framework (Paragraphs 108 – 111);
- Manual for Streets;
- Manual for Streets 2;
- 6Cs Design Guide;
- Guidance on Transport Assessment;
- Guidelines for Providing for Journeys on Foot;
- Guidelines for the Environmental Assessment of Road Traffic;
- Ashfield Transport Study;
- Ashfield District Council – Residential Parking Standards Supplementary Planning Document (SPD);
- A611 Corridor Study; and
- Nottinghamshire Local Transport Plan.

5.2 Detailed overview

The *Manual for Streets* (MfS) identified a user hierarchy that emphasised the importance of considering the needs of pedestrians first, followed by cyclists and then public transport. This is described in **Figure 5.1**.

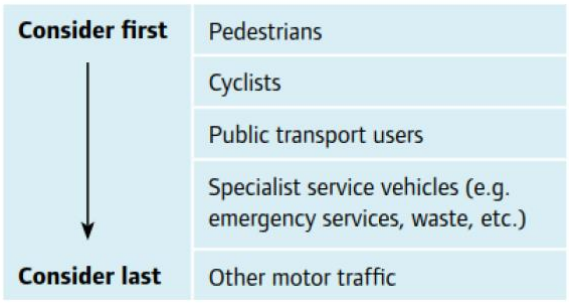


Figure 5.1: User Hierarchy from Manual for Streets

The guidance contained within *MfS* is directly reflected in the NPPF. The *MfS* stresses, however, that "the hierarchy is not meant to be rigidly applied and does not necessarily mean that it is always more important to provide for pedestrians than it is for the other modes. However, they should at least be considered first, followed by consideration for the others in the order given. This helps ensure that the street will serve its range of users in a balanced way. There may be situations where some upper-tier modes are not provided for – for example, buses might not need to be accommodated in a short, narrow section of street where access for cars is required."

Given the guidance contained in the NPPF and *MfS*, as well as the principles contained in the Nottinghamshire LTP, this section has considered access by sustainable modes of transport first before moving on to consider private cars.

5.2.1 Accessibility

The site is bounded by Kirkby Lane to the south, Pinxton Lane to the north and farmland to the east and west. The location of the site within its local highway context is shown in **Figure 5.2**.

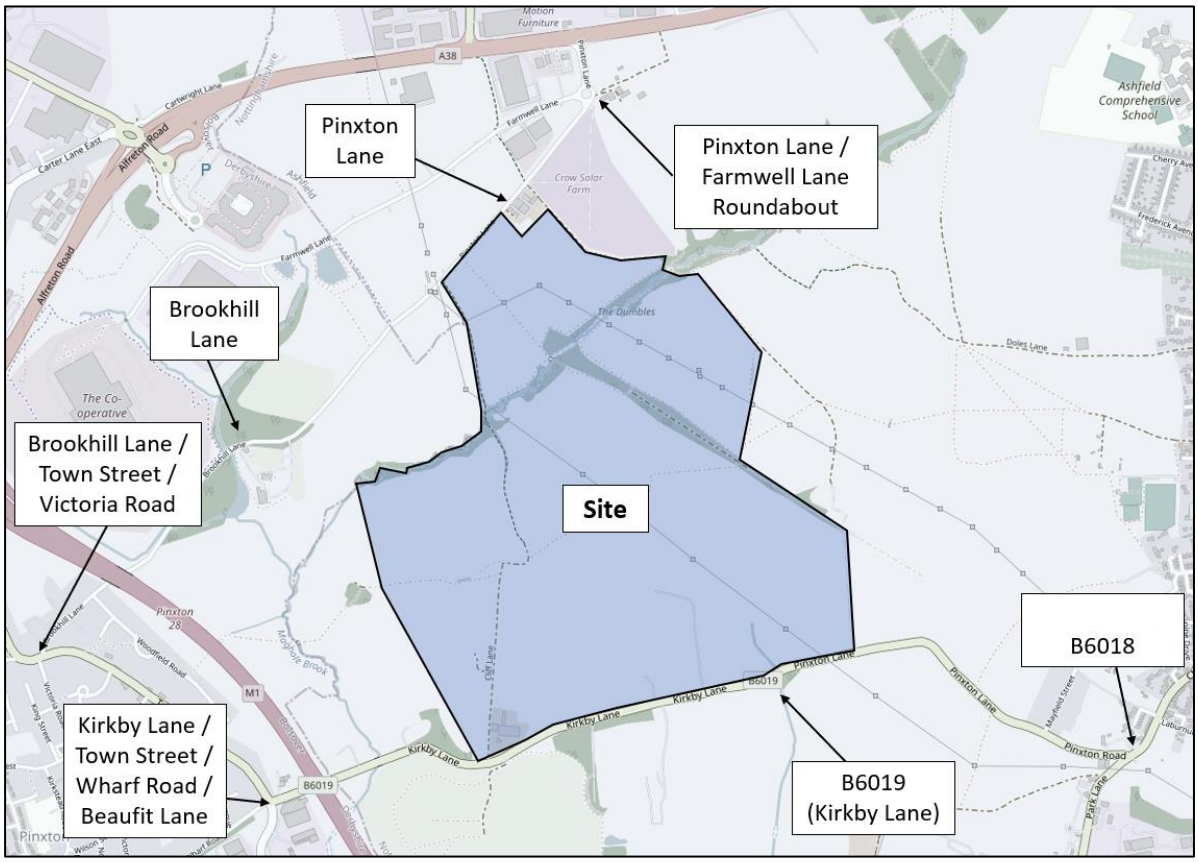


Figure 5.2: Site 1 – local highway context

The site is located east of the M1 motorway and south of the A38. To the immediate north is the Castlewood Business Park and East Midlands Designer Outlet. To the west is Pinxton (and the Brookhill Industrial Estate) and to the east is the settlement of Kirkby-in-Ashfield (and the Park Lane Business Park). Section 5.2.2 discusses access to these nearby facilities on foot / cycle; however, as can be seen from Figure 5.x, the site location inherently limits accessibility to the site by non-motorised modes since it is distant from existing settlements. Section 5.2.3 considers accessibility by public transport and Section 5.2.4 considers how to access the site by private vehicle.

In terms of the immediate highway structure, to the north of the site, Pinxton Lane is a narrow two-way single carriageway road. At the northern end of Pinxton Lane, a roundabout junction provides connection into Castlewood Business Park as well as connection onto the A38. Travelling south, the road becomes Brookhill Lane which then reaches the B6019 (to the north of Pinxton) at a signal controlled staggered crossroads.

To the south of the site, Kirkby Lane connects Pinxton with the B6018 (which provides subsequent connection to Kirkby-in-Ashfield). Kirkby Lane is a two-way single carriageway route that follows the national speed limit along the length of the southern boundary of the proposed site.

- to the west, Kirkby Lane connects with Town Street, Wharf Road and Beaufit Lane at a priority crossroads (with Town Street and Beaufit Lane being the major arms). Wharf Road can then be used to connect to Pinxton village.
- to the east, Kirkby Lane connects to the B6018 via a priority junction (with Kirkby Lane being the minor arm). The B6018 connects to Kirkby-in-Ashfield to the north and Selston in the southwest.

The wider transport context is shown in **Figure 5.3**.

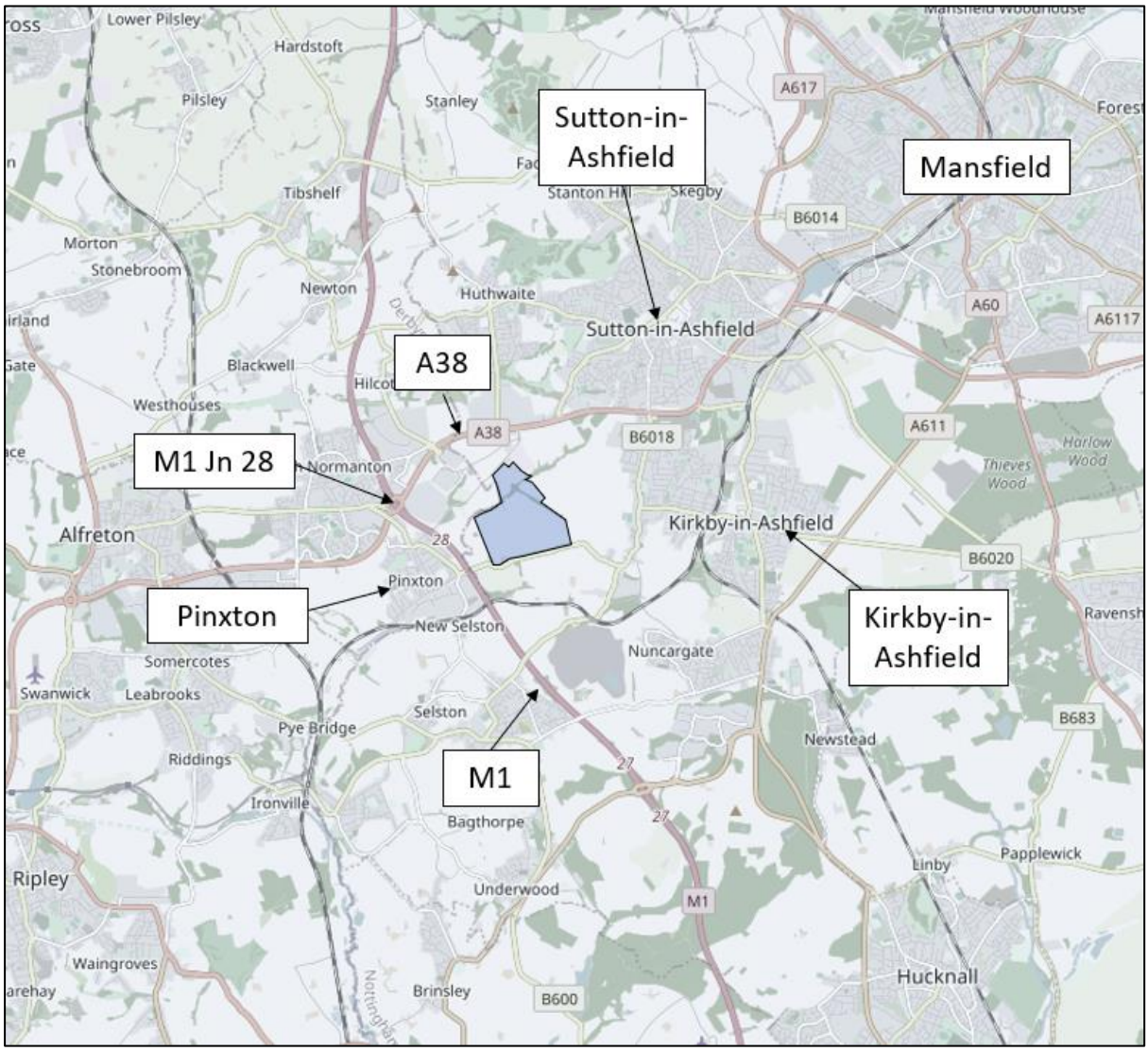


Figure 5.3: Site 1 – Wider highway context

5.2.2 Site Access – Walking and Cycling

The *Guidelines for Providing for Journeys on Foot* (Chartered Institute of Highways and Transportation, CIHT, 2000) describes a 'maximum', 'acceptable' and 'desirable' walking distances. The CIHT suggests that walking distances up to 2,000m can be considered the 'preferred maximum' for commuting journeys, walking to school and recreational journeys. 'Desirable' and 'acceptable' distances are 500m and 1,000m, respectively. This advice is summarised in **Table 5.1**.

Table 5.1: CIHT walking distance and time thresholds

CIHT Standard	Distance (metres)		Walk time (minutes)	
	Commuting, Walking to school and Recreation	Other non-commuter journeys	Commuting, Walking to School and Recreation	Other non-commuting journeys
Desirable	500	400	6.25	5
Acceptable	1,000	800	12.5	10
Maximum	2,000	1,200	25	15

Local Transport Note 2/08 – Cycle Infrastructure Design (DfT, October 2008)) document states that "many utility cycle journeys are under 3 miles (5km), although for commuter journeys, a trip distance of five miles (8km) or more is not uncommon". As such, it is generally accepted that cycling has the potential to substitute for short car trips, particularly for those of 5km or less.

Based on the above thresholds, **Figure 5.4** shows 1km and 5km isochrones overlaid over the site. An 8km isochrone has also been included, given the extending range and emerging popularity of e-bikes. The centre point of the isochrone mapping is at the centre point of the proposed site.

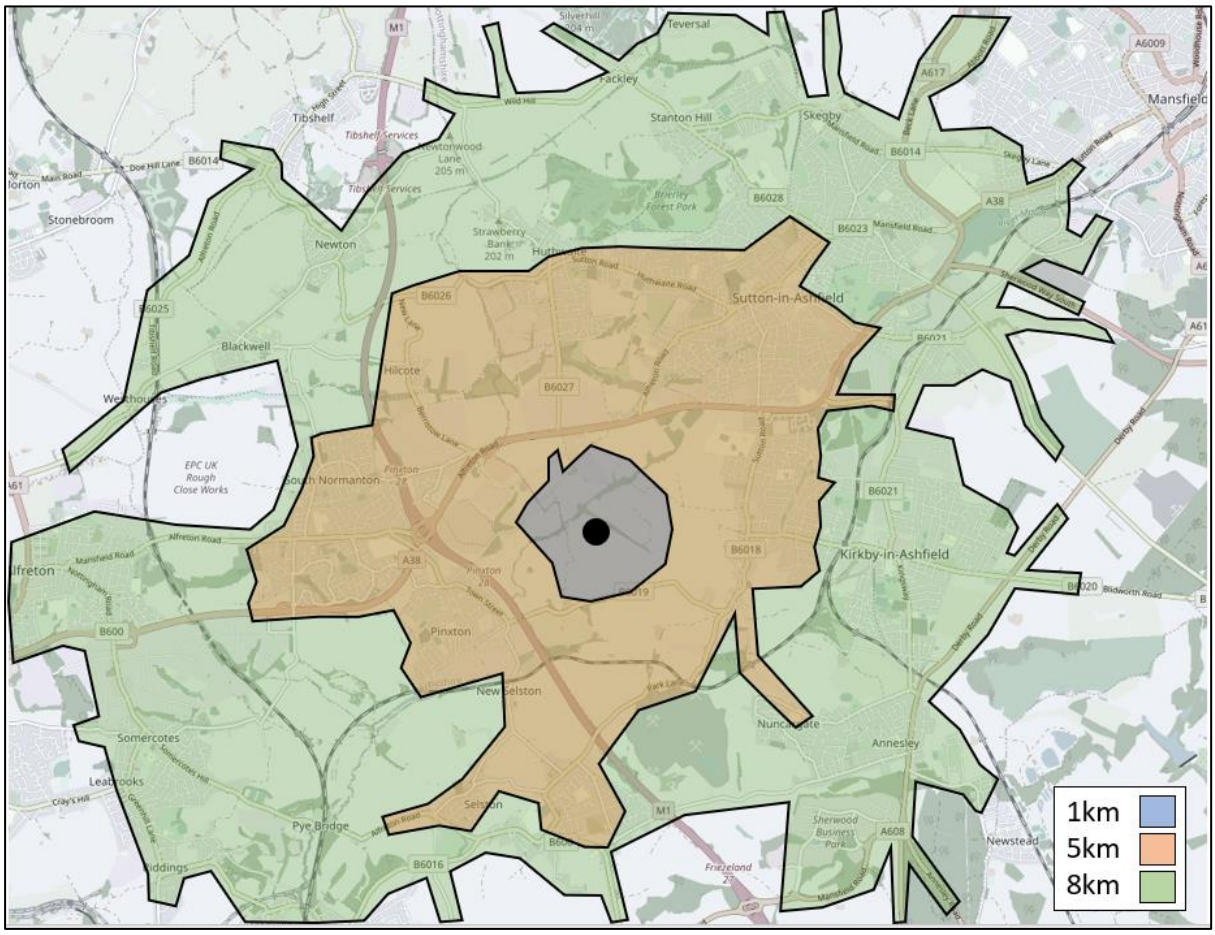


Figure 5.4: 1km, 5km and 8km isochrone

No facilities are accessible from the centre point of the site within the 1km walking threshold (owing to the site's location and overall size, as previously stated); however, the Castlewood Business Park (a large employment site) is accessible approximately 1.2km to the northwest, which would therefore be accessible on foot from the northern parcels of the site. A shared footway / cycle way commences at the northern end of Pinxton Lane (near the Pinxton Lane / Farmwell Lane roundabout) but otherwise there is no footpath along Pinxton Lane itself.

Figure 5.5 shows the Public Rights of Way (PRoW) available near to the site. As can be seen from this, several routes cross the proposed area, with potential connections available to into the Castlewood Business Park. Notwithstanding this, a footpath along Pinxton Lane (northward) and appropriate crossing points are likely to be required. For connections to the west, it would likely be more appropriate to explore upgrading the existing underpass to Pinxton since this would route from the centre of the development. Sutton in Ashfield could also potentially be reached via upgraded PRoW connections.

Within the site PRoW would need to be incorporated into the masterplan layout or diverted.

Figure 5.5: Public Rights of Way Map

The southern part of Sutton in Ashfield is accessible within the 5km cycling isochrone as well as Pinxton village to the south-west and South Normanton to the west. Castlewood Business Park is fully accessible within the 5km cycling threshold, as is Fulwood Industrial Park (a large industrial area to the north of the site accessed off of the B6027). Within the 8km e-cycling isochrone sits the whole of Sutton in Ashfield, Kirkby-in-Ashfield as well as the southern areas of Mansfield. In addition, smaller residential areas such as Alfreton, Somercotes, Newton, Annesley and Stanton Hill are also accessible. Considering employment sites, the Sherwood Business Park and Oakham Business Park are both accessible within the 8km threshold. As such, if the site is taken forward, then the site masterplan should be designed to allow permeability towards these compass points.

Figure 5.6 identifies all existing formal cycle infrastructure within the vicinity of the site. Shared cycleway / footways are available within the nearby Castlewood Business Park and on the A38 to the north of the site. The next nearest formal cycle infrastructure is located approximately 4.5km to the northwest (National Cycle Network route 67) and 4km to the northeast.

Figure 5.6: Cycle infrastructure within proximity of Site 1

5.2.3 Site Access – Public Transport

The *Guidelines for Planning for Public Transport in Developments* (CIHT, 1999) states that "generally walking distances to bus stops in urban areas should be a maximum of 400m and preferably no more than 300m". In rural areas the walking distance should be no more than 800m.

Due to the size of the proposed developments, no existing bus stop facilities are accessible within 800m of the centre point of the site. The nearest bus stop is located on Kirkby Lane to the immediate south of the development. It lies approximately 880m to the south of the site's centre point and therefore would be accessible to those living within the southern parcel of the site. The nearest bus stop to the north is located on Pinxton Lane (between the Pinxton Lane / Farmwell Lane roundabout and the Pinxton Lane / A38 junction). The bus stop is located approximately 1km north of the centre of the site, and therefore would be within the suggested 800m for those living in the northern parcel of the site.

Figure 5.7 identifies all bus stops located within the vicinity of the site. It shows that the existing bus stops within the vicinity of the site (Kirkby Lane and Pinxton Lane) provide a flag and pole (with timetabling information) only.

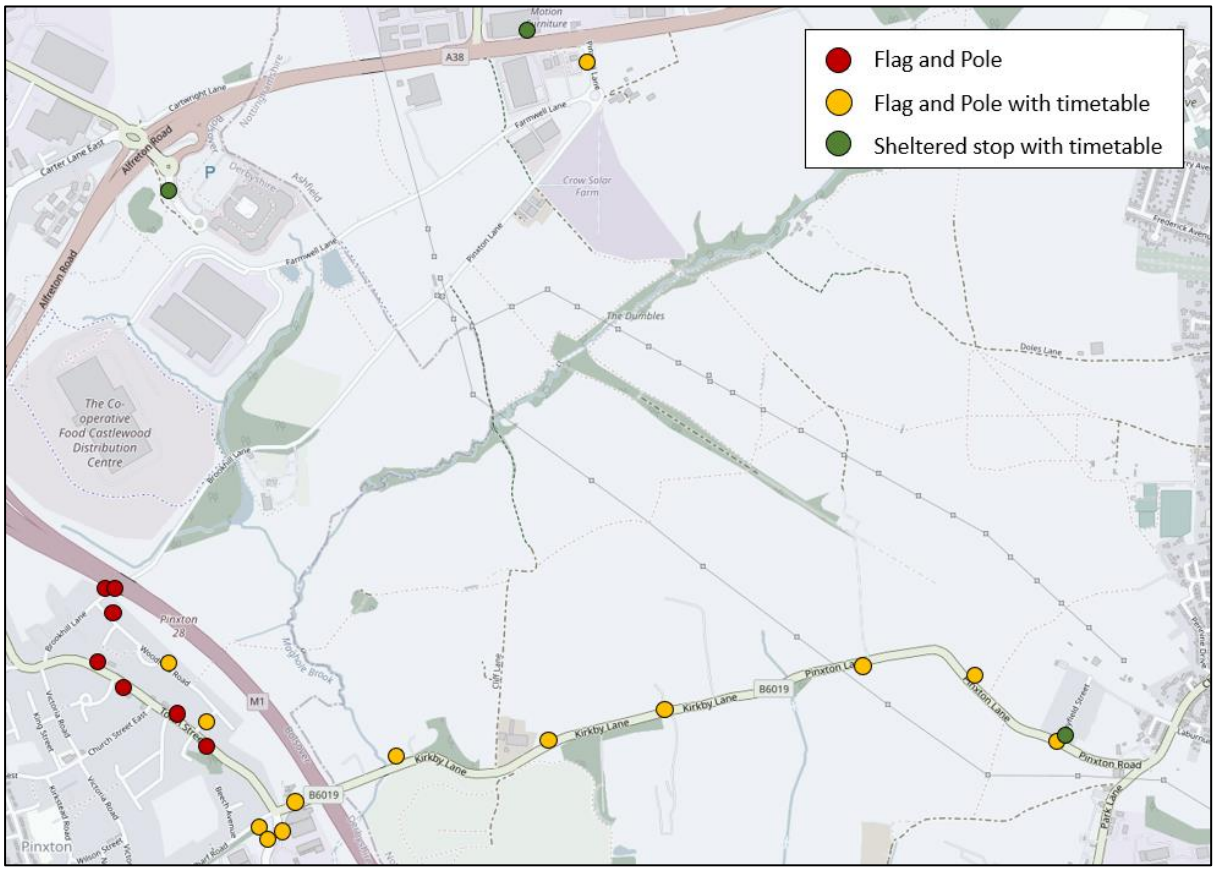


Figure 5.7: Bus stops located within the vicinity of the site

Figure 5.8 provides a summary of the buses serving the area, whilst Table 5.1**Table 5.2** provides a summary of their frequencies. Only services available to the public (i.e. no school services) are shown. It's important to note that the service frequency discussed in Table 5.x are the services running in the climate of the current COVID-19 pandemic, and therefore are likely to be reduced services compared to normal service operation.

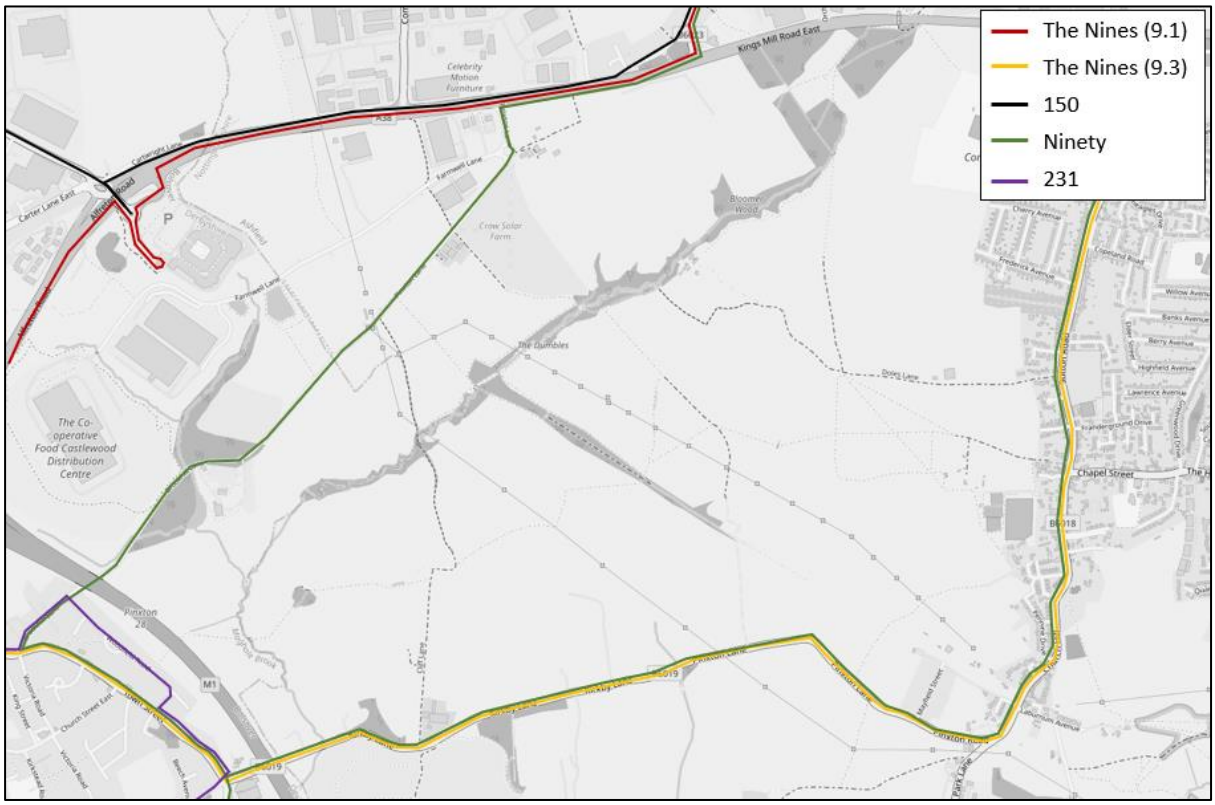


Figure 5.8: Buses serving the surrounding area

Table 5.2: Summary table of bus services (N.B. this shows reduced COVID-19 services)

Service	Operator	Route	Weekday	Saturday	Sunday
The Nines (9.1)	Trent Barton	Mansfield – East Midlands Outlet - Alfreton – Ripley - Derby	Every 30 minutes	Every 30 minutes	Every hour
The Nines (9.3)	Trent Barton	Mansfield – Kirkby-in-Ashfield - Alfreton – Ripley - Derby	Every 30 minutes	Every 30 minutes	Every hour
150	Littles Travel	Matlock – Alfreton – Clay Cross – Sutton in Ashfield	2 per day	No service	No service
Ninety	Trent Barton	Sutton in Ashfield – Kirkby – Selston – Ripley	Every hour	Every hour	No service
231	Stagecoach	Alfreton – Pinxton	Not currently operating	Not currently operating	Not currently operating

There may be potential to divert existing services into the site to serve residents. This would require consultation with existing operators and is more likely in respect of those routes routeing to the south of the site than the north. For a site of this size, however, a bespoke service may be required.

The nearest railway station to the site is Kirkby-in-Ashfield railway station, which lies 3km to the east of the centre of the site as the crow flies. Sutton Parkway Station lies 3.75km northeast of the site as the crow flies. Both stations lie on the Robin Hood Line, which connects Nottingham to Worksop. The towns and villages served by the route are Nottingham, Bulwell, Hucknall, Newstead, Kirkby-in-Ashfield, Sutton in Ashfield, Mansfield, Mansfield Woodhouse, Shirebrook, Langwith, Nether Langwith and Whaley Thorns, Cresswell, Whitwell and Worksop.

During the daytime (between Monday and Saturday) there is a half-hourly service between Mansfield Woodhouse and Nottingham, with services between Mansfield Woodhouse and Worksop operating hourly. There is a reduced service on Sundays, with services operating every 2 hours between Nottingham and Worksop.

Both stations currently lie outside the suggested 5km cycling isochrone (see Figure 5.x), owing to limited existing routes to the east of the site. Should routes be provided to the east as part of the site design both stations would be accessible within a 5km cycle of the full site. Information contained on the National Rail website does not identify any cycle parking available at Kirkby-in-Ashfield station (it was not possible to validate this via a site visit owing to the ongoing COVID-19 pandemic). The National Rail website states that 20 storage spaces are available at Sutton Parkway.

There are aspirations, recently published by Midlands Connect, to increase connectivity to Toton HS2 Station via improved services via Kirkby-in-Ashfield and Sutton Parkway. Historic proposals include reopening the Maid Marion Line which may create a station in nearby Pinxton, for which an Economic Impact Analysis study was recently commissioned by Ashfield District and Mansfield District Councils[16].

There are no direct bus services linking the site with Kirkby-in-Ashfield railway station. The Nines (9.3) departs from Kirkby Lane and arrives at Kirkby Cross, following which there would be a 14 minute walk to the station. It would also be possible to take the Nines (9.1) from the A38, then change in Sutton Town Centre onto the Threes (A) which passes close to Kirkby train station.

5.2.4 Site access – private vehicles

Access Junction: The site has been assessed based on an initial identified capacity of 1,611 dwellings. The *6Cs Design Guide* (which is the local highway design guide maintained on behalf of several authorities by Nottinghamshire County Council) indicates a maximum of 400 dwellings from a single point of access (assuming a Major Residential Access Road is provided). As such, at least two points of access would be required; however, it should be noted that, for a site of this size, the more access points that can be created allows for greater dispersion of trips which can assist mitigate impacts in areas of high congestion.

Opportunities for access to the site exist on Pinxton Lane to the north, and Kirkby Lane to the south. At this stage, it is anticipated (ahead of detailed modelling) that both would be provided as roundabout junctions; however, given the straight alignment of both Pinxton Lane and Kirkby Lane, provision of junctions at either location do not appear to be constrained (subject to design work being undertaken). It is noted that both Pinxton Lane and Kirkby Lane are minor roads and are relatively narrow.

Trip Generation: The number of trips that could be generated by a development can be estimated using information from the *Trip Rate Information Computer System* (TRICS). This is an industry-standard database of traffic counts across the United Kingdom, categorised into different types of land-use class. By examining counts of known developments, the likely trips associated with new development can be inferred. TRICS is recommended for this purpose by the DfT.

TRICS allows comparable sites to be selected using a number of criteria. In this case, the most pertinent criteria is located with respect to existing settlements. All sites from London have been removed (owing to the dense public transport networks). Of the available locational classifications, the following have been selected:

- town centre ×
- edge of town centre ×
- suburban area ×
- edge of town ✓
- neighbourhood centre ✓

[16] Available at: https://www.ashfield.gov.uk/media/6748/6096301-maid-marian-ashfield-eba-draft-210220.pdf

- free standing ✓

In addition, it is common practice to provide trip generation estimates as 85%ile rates for both the AM and PM peak hours. An 85%ile rate is used for junction capacity testing as only 15% of the TRICS sample lies above this rate and therefore these rates provide a robust test of nearby junctions. Notwithstanding this, it is important to understand that trip rates tend to reduce as developments increase in size. This is because, for a small site, trips are required to leave the site for a variety of trip purposes that can be contained within a larger site (with more on-site facilities). As such, the trip generation estimates provided in **Table 5.3** are average trip rates (i.e. 50% of the TRICS sample produced more trips than indicated in the table, and 50% of the TRICS sample produced fewer than those indicated in the table). Peak hours have been used since outside of these hours a residential development would create less traffic, and the wider network would also be less busy.

Table 5.3: Trip Generation Estimate of Site 1 (Weighted Average Trip Rates)

Rate Basis	AM (0800 – 0900hrs		PM (1700 -1800hrs)	
	Arrivals	Departures	Arrivals	Departures
Per Dwelling	0.133	0.382	0.351	0.162
1,750 Dwellings	233	669	614	283

At this stage, the above trip generation estimates are indicative, since the range of on-site facilities and precise dwelling numbers is unknown (the above table is based on a dwellings figure of 1,750).

5.2.5 Offsite highway capacity and safety

Policy Tests: The NPPF states that, in assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

- appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;
- safe and suitable access to the site can be achieved for all users; and
- any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

The NPPF also provides the key policy test (at paragraph 109) where it states that “development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.”

Highway Capacity: Figure 5.9 shows the likely main routes of trips away from the development site, which is based on an initial manual estimate of trip ends. The routes cover roads and junctions that are managed and maintained by three highway authorities: Highways England (M1, M1 Junction 28 & A38 west of Jct 28), Nottinghamshire County Council (the majority of routes east of the M1) and Derbyshire County Council (the majority of routes west of the M1, but also including a short section of the A38 east of the M1).

It is likely that the dominant draw from the site would be towards the A38 and M1. For a site of this size, however, it is likely that a full assessment using a dynamic highway re-assignment model would be needed, which would more fully inform the area of influence of the proposed scheme. It is understood that the site falls within several existing model areas, and therefore some work would be required to understand which model would be the most appropriate (or if a bespoke model would be the best approach). Under such circumstances, the DfT recommends the production of an Appraisal Specification Report (ASR) to identify the traffic modelling methodology, and this would be the first step in producing a robust Transport Assessment supporting the scheme. The modelling approach would need to be agreed with each of the highway authorities, since the impacts would be felt across all three highway networks.

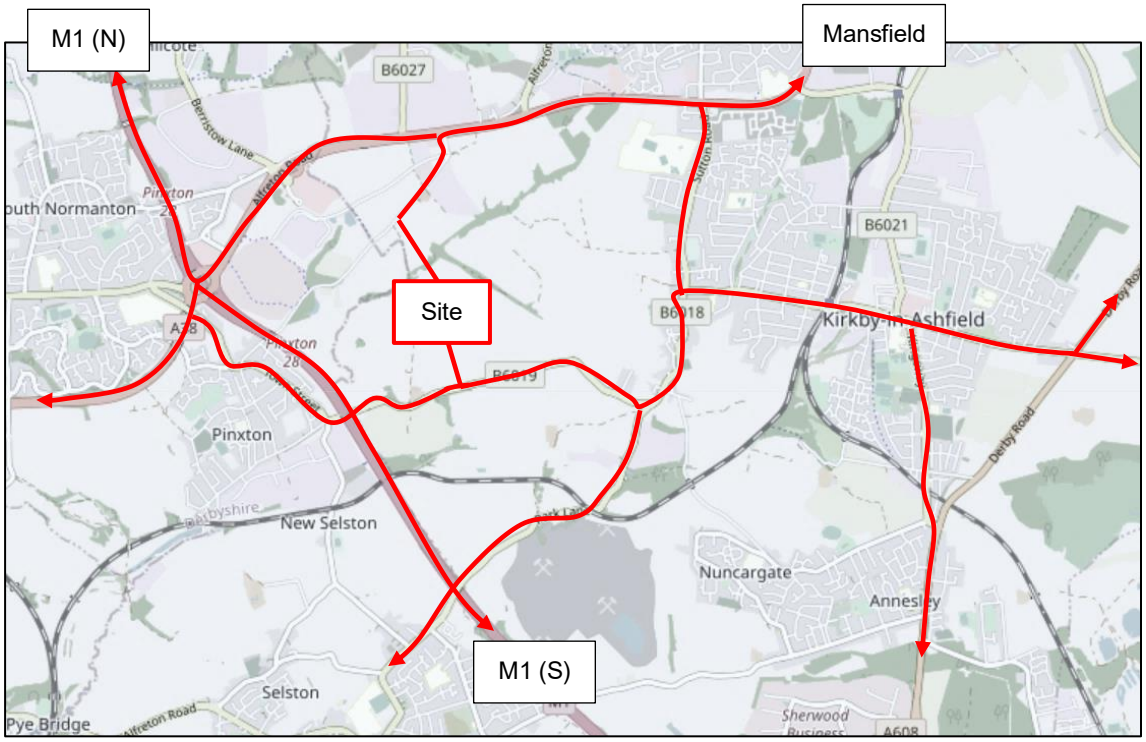


Figure 5.9: Routeing of trips from settlement

The *Guidance on Transport Assessment* (GTA) provides a starting point for detailed junction capacity assessment where there is a change in traffic flow of 30 two-way trips per hour. For environmental impacts (such as noise and air quality impacts), a change in traffic flow of 30% is the normal trigger (as identified in the *Guidelines for the Environmental Assessment of Road Traffic*) or 10% in a sensitive area. The modelling work would therefore identify a study area for both the highway capacity impacts, and also the environmental impacts of traffic.

Given the trip generation provided in **Table 5.3**, however, it is likely that those routes in **Figure 5.9** would experience a change in traffic flow of greater than 30 two-way trips per hour. The following considerations therefore are material:

- The site will draw trips towards the A38 and M1 (Junction 28).
  - The A38 is a known corridor of congestion between the M1 (Junction 28) and Mansfield.
    - Within the Nottinghamshire LTP, it states that "stress maps have been produced by organisations on behalf of Ashfield, Bassetlaw and Newark & Sherwood district councils during the development of their local development frameworks. This work has only identified two locations on the County Council's road network that currently operates over capacity – the B6026 Huthwaite Road, and a section of the A38 in Ashfield district."
    - Previous work undertaken by consultants Systra (in support of the withdrawn Ashfield Local Plan) concluded that "the removal of the predicted congestion along the A38 corridor is not achievable without significant investment in road infrastructure in the form of additional lanes, grade separation of junctions or the development of alternative bypasses. This level of improvement is unlikely to be feasible both regarding cost and in deliverability terms for the Local Plan and other available funding sources."
  - The M1 (Junction 28) is a known location of congestion, with queues typically extending onto the M1 mainline both northbound and southbound in the peak hours, and from the directions of Mansfield and Derby.
- Some trips will reach the A611 corridor to the east. This corridor is also flagged in the Nottinghamshire LTP as suffering from high journey variability and a separate study prepared by AECOM identified a series of potential schemes to mitigate (to a greater or lesser extent) the impact of future growth.

As a minimum, detailed assessment would therefore be required at the M1 Junction 28 and at junctions along the A38 towards Mansfield. Given the M1 Junction 28 and A38 are existing locations of congestion, it is likely that

any mitigation would relate to the contribution to a larger scheme, rather than a scheme specific to the proposed development site.

We would also anticipate the wider study area including junction capacity tests and potential mitigation at:

- B6019 (Town Street) / Brookhill Lane;
- Mansfield Lane / Pinxton Lane;
- Town Street / Beaufit Lane / Wharf Road / Pinxton Lane priority crossroads;
- Park Lane / Pinxton Road;
- A611 / Nottingham Road; and
- A611 / Diamond Avenue.

A further consideration would be the layout of the site and potential to attract through-traffic as a short-cut to and from the A38 and M1 Junction 28 by existing traffic. This impact could only be assessed using a dynamic highway re-assignment model.

Road Safety: Road safety collision statistics have been obtained from the DfT (via the Crashmap database) from 01/01/2014 to 30/06/2019. The data obtained relates to those collisions that resulted in a personal injury and which were reported to the police. This data (known as STATS19 statistics) is generally recognised to be the most complete record of road collisions occurring on the local highway network. For the avoidance of doubt, and as is normal practice, they do not include statistics from collisions resulting in “damage-only” to vehicles, or which were not reported to the police.

Each collision resulting in a personal injury is classed as either ‘Slight’, ‘Serious’ or ‘Fatal’ by the police depending on the most serious injury resulting from the collision (i.e. a collision resulting in two ‘Slight’ injuries and one ‘Serious’ injury would be classified as a ‘Serious’ collision). Definitions given in Road Accidents Great Britain (published by the DfT) are as follows:

- Slight: An injury of a minor character such as a sprain (including neck whiplash injury), bruise or cut which are not judged to be severe, or slight shock requiring roadside attention. This definition includes injuries not requiring medical treatment.
- Serious: An injury for which a person is detained in hospital as an “in-patient”, or any of the following injuries whether or not they are detained in hospital: fractures, concussion, internal injuries, crushings, burns (excluding friction burns), severe cuts, severe general shock requiring medical treatment and injuries causing death 30 or more days after the accident. An injured casualty is recorded as seriously or slightly injured by the police on the basis of information available within a short time of the accident. This generally will not reflect the results of a medical examination but may be influenced according to whether the casualty is hospitalised or not. Hospitalisation procedures will vary regionally.
- Fatal: Human casualties who sustained injuries which caused death less than 30 days (before 1954, about two months) after the accident. Confirmed suicides are excluded.

The analysis of road safety data focuses on collisions occurring on the roads in the immediate vicinity of the site, with particular focus upon:

- A38 / Pinxton Lane;
- Pinxton Lane / Farmwell Lane;
- Pinxton Lane (and Brookhill Lane);
- Brookhill Lane / B6019;
- Kirkby Lane / B6019;
- Kirkby Lane; and
- Kirkby Lane / B6018.

The study area has excluded the A38 itself. **Figure 5.10** identifies all collisions recorded within the past 5 full years of collision data within the study area identified above.

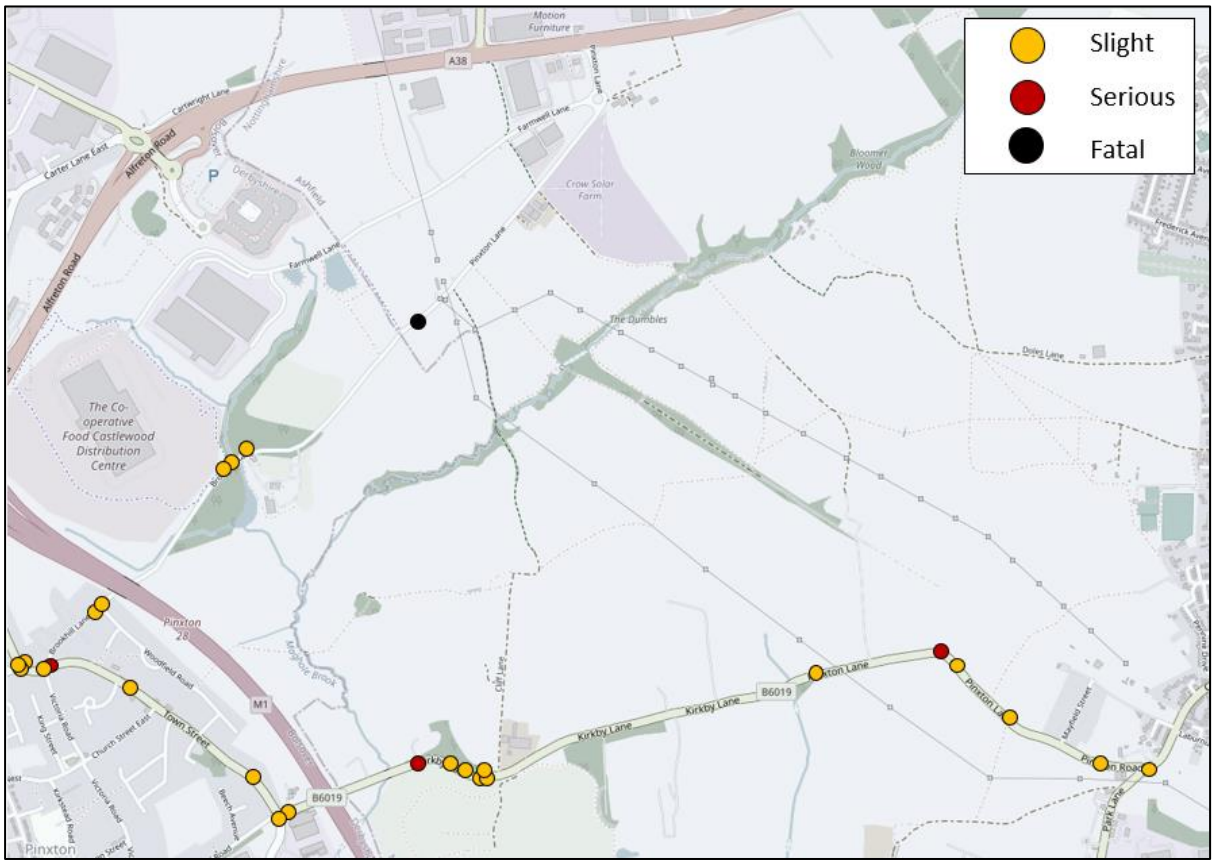


Figure 5.10: Collisions within the study area

The data shows that there is a concentration of collisions on Kirkby Lane at bends in the road. These are likely related to speed, and therefore a traffic calming scheme along Kirkby Lane is likely a mitigation requirement. Indeed, traffic calming may also be a useful mitigation measure if results from the dynamic highway re-assignment modelling indicates that the scheme could introduce development traffic on non-suitable roads (i.e. to deter rat-running).

Off-site highways and air quality

Air Quality in the District of Ashfield has been regularly reviewed by ADC for many years and has been confirmed as achieving national air quality objectives set for the protection of human health. The proposed settlement is far enough away from the M1 for the emissions from the M1 to not have a significant effect on the site.

Emissions from road traffic on the A38 are of concern but at this time annual mean concentrations of nitrogen dioxide do achieve objective value concentrations at all relevant receptor locations. ADC have engaged with the Nottinghamshire Environmental Protection Working Group and at the regional level through the East Midlands Air Quality Network to develop a Nottinghamshire Air Quality Strategy which was due for release late 2020.

Future planning applications should consider if the development would significantly affect air quality at:

- Designated ecological sites, especially from road traffic emissions
- Provide details of operational practices to manage construction dust adversely effecting health of amenity

Significant adverse effects are unlikely to be associated with the proposed development and while formal mitigation may not be required, there are good practice measures that future planning applications could look to include. For example:

- A demolition/construction dust impact assessment that results in a dust management plan for the proposed works;
- Consideration of charging infrastructure for plug in electrical cars and vans at retail centres and residential properties;

- Including infrastructure to reduce private car usage, by facilitating cycling or walking

Access to rail or bus services that reduce journeys along busier strategic routes such as A38/M1.

5.2.6 Parking requirements

Ashfield District Council have a Supplementary Planning Document (SPD) covering residential car parking standards. This SPD was prepared by ADC to provide guidance and advice for applicants/developers. The SPD sets out the Council's requirement for parking provision to serve new residential developments within the District and was developed in liaison with the local highway authority, Nottinghamshire County Council. The SPD requirements are set out in **Table 5.4**.

Table 5.4: Ashfield Parking Standards

Dwelling Size / Type	Parking provision
1 bed dwellings and Aged Persons Residence	1 space per unit plus 1 space off plot per 2 units for visitors
2/3 bed dwellings	2 spaces per unit
4+ bed dwellings	3 spaces per unit

Source: Ashfield Parking Standards Supplementary Planning Document

The SPD goes onto state that: "*car parking should be provided within the development site and within the curtilage of the property. Where car parking is located within the development site but beyond the new properties 'residential curtilage, at least one space should be allocated for use by each property. The allocated car parking space(s) need to be retained in perpetuity and be identified in the deeds of the dwelling*."

5.3 Access and movement summary

Table 5.5 presents a summary of the site assessment findings described in **Sections 5.1 and 5.2**. Each element has been assigned a Red-Amber-Green (RAG) rating.

Table 5.5: Site Assessment summary

Consideration	Discussion	RAG Rating
Accessibility – Walking & Cycling	The site is located in a comparatively isolated location with few facilities within recommended walking and cycling thresholds. A number of existing PRoW run through the site and the Castlewood Business Park is accessible for those living within the northern parcel of the development. Upgrades to existing PRoW and crossing points are likely required. Some residential parts of Sutton in Ashfield and Kirkby-in-Ashfield are accessible within a 5km cycling threshold; however, most employment and retail areas are not contained within this threshold. Some existing shared footways are available to the north of the site (as part of the Castlewood Business Park development). Cycle infrastructure would be required to connect the site, particularly to Sutton Parkway and Kirkby Railway Stations.	
Accessibility – Public Transport	Bus stops are located along Kirkby Road, Pinxton Road (for Castlewood Business Park) and within Pinxton village. None of these bus stops lie within 800m of the site. Three regular bus services serve these stops (9.1, 9.3 and the Ninety) with a frequency of every 30 minutes or every hour. A discussion with operators would be required regarding diverting one or more of these services into the site. Sutton Parkway and Kirkby-in-Ashfield Railway station are not currently accessible within recommended walking and/or cycling thresholds. Upgrades to cycle infrastructure would however enable these sites to be reached within the recommended 5km cycle threshold. No bus routes connect direct to this station.	

Site Access – Private Vehicles	At least two access points would be required to serve the 1,611 dwellings. Two access opportunities have been identified: Pinxton Lane to the north, and Kirkby Lane to the south. At this stage, it is anticipated (ahead of detailed modelling) that both would be provided as roundabout junctions. Pinxton Lane provides access to the A38 to the north. Pinxton Lane and Kirkby Road are both two-way single carriageway minor routes and are narrow in places. It is likely that trips would gravitate north towards the A38 and M1, concentrating impacts on these routes.
Offsite Highway Capacity and Safety	It is likely that the dominant draw from the site would be towards the A38 and M1, however given the size of the site a dynamic highway re-assignment model would be needed to fully assess assignment of development traffic. Further junction capacity tests would also be required. Given the M1 Junction 28 and A38 are existing locations of congestion, it is likely that any mitigation would relate to the contribution to a larger scheme, rather than a scheme specific to the proposed development site. Data shows a concentration of collisions on Kirkby Lane, likely related to speed. As such, traffic calming is a suggested mitigation measure.

5.4 Estimated abnormal costs for proposed mitigation solution

There are no on-site abnormal costs as all are covered in base costs. However, there are a number of off-site costs including two sites access points, Pinxton Lane N for roundabout at £1,500,000 and Kirkby Lane S as a T junction at £1,250,000. Other abnormal costs include B6019 (Town Street)/ Brookhill Lane new signalised junction at £1,250,000, Town Street / Beaufit Lane / Wharf Road / Pinxton Lane priority crossroads new signalised junction at £1,250,000 and Park Lane / Pinxton Road new signalised junction also at £1,250,000. £1,000,000 has also been allowed for off-site pedestrian/ cycle works.

In addition, there are a number of abnormal costs which have been excluded as contribution. These are the M1 Junction 28, A38 dualling for 3.5 km and Mansfield Lane/ Pinxton Lane. As well as A611/ Nottingham Road, A611/ Diamond Avenue and lettered A38 junctions which are not to be included.

This results in a total cost of £11,212,500 for transport including adoption fees (£750,000) commuted sums (£750,000), professional fees (£750,000) and design development and construction contingency (£1,462,500).

6. Ground conditions

6.1 Existing reports / information referred to

The following sources of information have been referred to in the Ground Conditions section;

- AECOM Ground Engineering and Mining webGIS portal. Accessed 26th May 2020;
- BGS Geological Map: Solid and Drift (1:50,000): 'Chesterfield' (Sheet 112). 2012;
- BGS Geoindex[17];
- Environment Agency's catchment data search[18];
- Environment Agency's water resources map[19];
- Google Earth Pro. Accessed 26th May 2020;
- Magic Maps[20];
- National Library of Scotland for Historical Maps[21];
- Nottinghamshire Minerals Local Plan, Publication Version 30th August 2019 - 11th October 2019. Was submitted to the Secretary of State for Housing, Communities and Local Government on 6th February 2020, however, has not been formerly adopted;
- Radon maps[22]; and
- Zetica's online Unexploded Ordnance (UXO) risk maps[23].

6.2 Detailed overview

6.2.1 Geology, hydrogeology and hydrology

The superficial and solid geology at the site has been established by reference to BGS mapping. There are no BGS historical borehole records held within 250m of the site.

Descriptions of the bedrock geology have been obtained from the BGS Lexicon.

A generalised ground profile utilising the available geological mapping is summarised in **Table 6.1**.

Table 6.1: Generalised ground conditions from available sources

Geological unit	Thickness	Composition	Occurrence
Made ground	Variable	Varied composition	Made ground mapped adjacent to the south of the site (none mapped on the site itself)
Bedrock – Pennine Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone) and (Sandstone)	450 – 600m	Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.	Underlying topsoil or made ground (where/if present)
Coal seams (inferred and observed)	Unknown	Coal seam	Across the site, various directions. Within the bedrock formation.
Faults (inferred)	-	-	Three mapped across the site; two are located in the western/southern area (approximate north-west to south-east direction) and one is located in the north of the site (approximate north-east to south-west direction)

[17] Available at: https://www.bgs.ac.uk/geoindex/. Accessed 26th May 2020
[18] Available at: https://environment.data.gov.uk/catchment-planning/ Accessed 26th May 2020
[19] Available at: https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=c9176c299b734cff9a6deffcf7f40a4e. Accessed 26th May 2020
[20] Available at: https://magic.defra.gov.uk/magicmap.aspx. Accessed 26th May 2020
[21] Available at: https://maps.nls.uk/geo/find/#zoom=5&lat=56.00000&lon=-4.00000&layers=102&b=1&z=1&point=0,0. Accessed 26th May 2020
[22] Available at: https://www.ukradon.org/information/ukmaps. Accessed 26th May 2020
[23] Available at: https://zeticauxo.com/downloads-and-resources/risk-maps/. Accessed 26th May 2020

m = metres
Superficial deposits – not mapped on the site
Source: BGS Geoindex and BGS geological map (Sheet 112, Chesterfield)

Hydrogeological and hydrological information is summarised in **Table 6.2** and **Table 6.3** respectively.

Table 6.2: Hydrogeological information

Data type	Detailed description
Underlying geology aquifer classes	Solid Geology: Secondary 'A' Aquifer (Pennine Middle Coal Measures Formation): defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. The bedrock is classified as medium vulnerability. These are medium priority groundwater resources that have some natural protection resulting in a moderate overall groundwater risk. Activities in these areas should as a minimum follow good practice to ensure they do not cause groundwater pollution.
Groundwater quality	No information available.
Groundwater Source Protection Zone (SPZ)	The site is not located within a groundwater SPZ. There no groundwater SPZs located within 1km of the site boundary.
Groundwater abstractions	The Environment Agency's water resources map does not list any groundwater abstraction licences within 1km of the site.
Discharge consents to groundwater	Unknown.

Source: Magic Maps and the Environment Agency's water resources map

Table 6.3: Hydrological information

Data type	Detailed description
Surface water receptors	Streams/drains are located on the site in the northern and south-eastern areas. The streams/drains in the north appear to be tributaries of Maghole Brook, located approximately 180m west of the site at its closest point. The streams/drains in the south-east appear to be tributaries of the River Erewash, located approximately 370m south of the site at its closest point.
Surface water quality	The General Quality Assessment (GQA) was the Environment Agency's national indicator for water quality in rivers and canals, from 1990 until 2009. These assessments were made for Biological, Chemical and Nutrients and undertaken at sample points for discrete river stretches. GQA was replaced by the Water Framework Directive in 2009. The Water Framework Directive (WFD) waterbody for the site is 'Erewash from Source to Nethergreen Brook'. The overall classification for 2016 was 'poor' for this waterbody.
Surface water abstractions	The Environment Agency's water resources map does not list any surface water abstraction licences within 1km of the site.
Discharge consents to surface water	Unknown.

Source: Environment Agency's water resources map and catchment data search

6.2.2 Current and historical land use of the site and surroundings

Current mapping indicates that the majority of the site is occupied by farms and farmland. Adjacent to the north of the site is an electricity distribution station and substation. Castlewood Business Park is located adjacent to the north of the site, beyond Pinxton Lane and appears to be large warehouse/office type buildings.

Table 6.4 is a record of the change in land uses at the site and surrounding area (using Ordnance Survey historical maps). The off-site changes have been tracked within 250m of the site (unless specified otherwise) and all distances quoted are approximate.

Table 6.4: Summary of historical land use

Map details	On Site	Off Site
Nottinghamshire (includes Kirkby-in-Ashfield; Pinxton; Selston; South Normanton; Sutton in Ashfield) Surveyed: 1879 Published: 1884	Mostly open land/potential farmland with occasional buildings Old Clay Pit, in the north of the site potentially now infilled	Farms and farmland

Map details	On Site	Off Site
Derbyshire (includes Kirkby-in-Ashfield; Pinxton; Selston; South Normanton; Sutton in Ashfield.) Revised: 1898 Published: 1901	Railway line (Derbyshire Lines – later named 'Great Central Railway', then 'London and North Eastern Railway'), located in the north and east of the site	Langton Colliery Branch railway – located adjacent to the south of the site
Derbyshire (includes Kirkby-in-Ashfield; Sutton in Ashfield.) Revised: 1913 to 1914 Published: 1921	No changes	No changes
Derbyshire (includes Kirkby-in-Ashfield; Pinxton; Selston; South Normanton; Sutton in Ashfield.) Revised: 1938 to 1939 Published: ca. 1949	No changes	No changes
Google Earth Pro historical aerial imagery. 2001	Railway no longer apparent	Railway no longer apparent
Google Earth Pro historical aerial imagery. 2007	No changes	Potential earthworks adjacent to the north of the site
Google Earth Pro historical aerial imagery. 2010	No changes	Warehouse/large office type structure to the north of the site, approximately 150m
Google Earth Pro historical aerial imagery. 2019	No changes	Warehouse type structure to the north of the site, adjacent

Source: National Library of Scotland and Google Earth Pro

6.2.3 Landfills

The AECOM Ground Engineering and Mining webGIS portal indicates that there are no landfills located within the site boundary. There is one historical landfill within 250m of the site, with details as follows:

- Fulwood Disused Railway Cutting historical landfill, north of Pinxton Lane, Fulwood, located adjacent to the north of the site. Dates active: December 1979 – December 1982. Waste type: Inert, Industrial, Commercial and Household.

6.2.4 Potential contaminated land

In summary, the following potential on-site and off-site sources of contamination have been identified:

<u>On-site sources:</u>

- Made ground: potential for made ground based on current and historical land uses including;
  - Current farms and farmland;
  - Potentially infilled clay pit (in the northern area); and
  - Historical railway in the north and east.
- Coal seams: potential for ground gas from coal bearing strata.

<u>Off-site sources:</u>

- Made ground: potential for made ground based on current and historical land uses including;
  - Mapped made ground adjacent to the south of the site;
  - Current farms and farmland: adjacent and up to 250m from the site;
  - Historical landfill: adjacent to the north of the site;
  - Historical railway: adjacent to the south of the site;
  - Electricity distribution station and substation: adjacent to the north of the site; and
  - Light industrial/commercial land uses (Castlewood Business Park): adjacent to the north of the site.
- Coal seams

6.2.5 Unexploded ordnance

A review of Zetica's publicly available online Unexploded Ordnance (UXO) risk maps indicates that the site is within a 'low' area for the presence of sub-surface UXO. This is an area indicated as having 15 bombs per 1000 acre or less.

6.2.6 Radon potential

The south and west of the site are located in an area where 1%-3% of homes are above the action level for radon. The north and east of the site are located in an area where 5%-10% of homes are above the action level. Protection measures would be required within new buildings across the site.

6.2.7 Mining (coal and other)

According to the BGS Geoindex, the majority of the site is located in a Primary Opencast Coal Resource Area for shallow coal. The northern extent is located in a Secondary Opencast Coal Resource Area for shallow coal. This indicates the potential for shallow workings which may influence development and foundation options.

The AECOM Ground Engineering and Mining webGIS portal indicates the following;

- Coal outcrops in various directions across the site. These outcrops are identified as 'Development High Risk Areas'. This indicates that these features have the potential for instability or a degree of risk to the surface from the legacy of coal mining operations;
- There are no recorded mine entries located on-site, the closest is located approximately 50m east and is identified as a 'Development High Risk Area'; and
- There are no past shallow coal mine workings, probable shallow coal mine workings or past and current surface mining mapped on-site or within 250m, although unrecorded workings may exist.

Risks from other mining (non-coal related) is not anticipated, according to publicly available online sources.

6.2.8 Minerals

The Nottinghamshire Minerals Local Plan indicates that the site and the surrounding area is located in a Mineral Safeguarding Area (MSA) for surface coal, as shown in **Figure 6.1**.

The MSA is defined by minerals and waste planning authorities. They include viable resources of minerals and are defined so that inferred resources of minerals are not sterilised by non-mineral development. The MSA does not provide a presumption for these resources to be worked. The surface coal MSA may be a potential constraint for future development.

Figure 6.1: Minerals Consultation Area and Minerals Safeguarding Area designation at Site 1

6.3 Risks

6.3.1 Geo-environmental

The review of the potential geo-environmental risk is based on the review of publicly available on-line resources only.

The Conceptual Site Model (CSM) identifies potential source-pathway-receptor pollutant linkages that require further assessment. This is consistent with the staged approach advocated by the Environment Agency's recently published revised online guidance for the management of land contamination ('Land contamination: risk management (LCRM)[24]) and the soon to be withdrawn CLR11[25] 'Model Procedures for the Management of Land Contamination' (2004). The Conceptual Site Model is set out in Table 6.5 (overleaf).

[24] Environment Agency (2019). Land Contamination: Risk Management (https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks - accessed 6th February 2020)
[25] Environment Agency, (2004). CLR11: Model Procedures for the Management of Land Contamination.

Table 6.5: Conceptual Site Model

Source	Pathways	Receptors
Potential contaminants in the soil and groundwater at the site from: <u>On-site sources:</u> • Made ground: potential for made ground based on current and historical land uses including; – Current farms and farmland; – Potentially infilled clay pit (in the northern area); and – Historical railway in the north and east. • Coal seams. <u>Off-site sources:</u> • Made ground: potential for made ground based on current and historical land uses including; – Mapped made ground adjacent to the south of the site; – Current farms and farmland: adjacent and up to 250m from the site; – Historical landfills: adjacent to the north of the site; – Historical railway: adjacent to the south of the site; – Electricity distribution station and substation: adjacent to the north of the site; and – Light industrial/commercial land uses (Castlewood Business Park): adjacent to the north of the site. • Coal seams.	• Dermal contact, inhalation or ingestion of the contaminants present in topsoil or underlying strata, during works and post-development; • Migration, accumulation and inhalation of ground gas, during works and post-development; • Migration of airborne contaminants (e.g. dust particulates) during the development work; • Vertical and lateral soil leachate migration to groundwater and/or surface water; • Migration of contaminants through groundwater; • Migration of contaminants through lateral migration/surface run off; and • Direct contact/plant uptake.	• Future site users (human health); • Current site users (agricultural/members of the public) (human health); • Future construction and maintenance workers (human health); • Groundwater within the Secondary ‘A’ aquifer; • Surface water (streams/drains located on the site and Maghole Brook, located approximately 180m west of the site); • Future landscaping; and • Development infrastructure.

There is considered to be a generally low to locally moderate potential risk of ground contamination. The moderate risk is limited to the location of the potentially infilled clay pit to the north of the site, historical railway north and east of the site and also the area in close proximity to mapped made ground and landfill (located adjacent to the site to the south and north, respectively). Potential on-site sources are limited but there may be made ground present which may not have originated from the site, as well as localised point sources associated with the site’s agricultural use, potentially infilled clay pit and historical railway use.

Historical landfills, infilled ground and shallow coal seams (on-site and off-site) may pose a potential ground gas risk.

Contamination risks would require further consideration as part of future redevelopment of the site.

6.3.2 Geotechnical

There is the potential for localised made ground associated with the current and historical land use at the site (associated with agricultural land use, a potentially infilled clay pit and historical railway). The extent of the made ground would need to be confirmed through further investigation.

Based on geological mapping and available BGS historical borehole logs, it is anticipated that superficial deposits are absent at the site and that the bedrock geology (Pennine Middle Coal Measures Formation) is located directly beneath topsoil/made ground (where present).

If made ground is confirmed to be present, and given its general vertical and lateral variability, it would be considered unsuitable as a founding stratum unless re-engineered. The viability of shallow foundations for typical low-rise housing is therefore dependent on the depth to competent solid geology. This needs to be proven through ground investigation.

Assuming the presence of near-surface (from <1 to 3 m depth) competent natural deposits, a shallow foundation solution is viable for typical low-rise development, provided there is a pattern of increasing consistency/density with depth. Alternatively, and dependent on specific thicknesses and material types, ground improvement could be considered especially in areas of (unexpected) thick and variable made ground. Consideration of the lateral variation between geological units and the potential for differential settlement will need to be accounted for in any future design. Although not indicated, in the event that significant thicknesses of made ground are encountered, deeper foundation solutions may be required, e.g. piling.

Coal outcrops in various directions across the site. These outcrops have been identified as 'Development High Risk Areas'. It is recommended that a detailed Coal Mining Risk Assessment (CMRA) is undertaken to inform on the legacy of potential coal mining at the site and an assessment of its potential impact on land stability, for the proposed end use.

The bedrock geology is a Secondary 'A' aquifer. Therefore, it is possible for shallow groundwater to be present. If shallow groundwater is encountered, it should be considered as part of any foundation solution. Site-specific groundwater levels would need to be confirmed during future ground investigation. Whilst it is ideal to design to avoid impact from groundwater, depending on the proposed development and should a shallow groundwater regime be present, this may not be possible and temporary support and/or suitable dewatering control may be required.

Where new structures are planned, the nature of the near surface soils should be clarified by further intrusive investigation. In particular, any investigation should take into consideration the NHBC Standards Chapter 4.2 and 4.4 (and/or published BRE guidance) relating to the design of foundations on shrinkable soils, the proximity of trees and the potential lateral and vertical variability of the near surface soils and potential for differential settlement should buildings be founded over variable materials.

Concrete foundations and service ducts may need to be designed against natural chemical attack from aggressive ground conditions.

The off-site historical landfills and on-site and off-site shallow coal seams are considered to be a potential ground gas source. Further monitoring and assessment may be required. Should ground gas be proven to a level that requires mitigation, this mitigation can be included for as part of the future detailed design.

6.4 Proposed mitigation solution

In order to enable further characterisation of the potential geo-environmental and geotechnical risks identified and allow for the refinement of the preliminary CSM, an intrusive ground investigation should be carried out and the composition, extent and depth of potential made ground and the ground conditions across the site confirmed.

During the intrusive investigation, it is recommended that representative soil samples are taken to determine the chemical status of made ground and natural soils. The ground investigation should also provide information on the physical properties of the materials through in-situ geotechnical testing and laboratory analysis. A period of groundwater monitoring and sampling and ground gas monitoring should also be undertaken at the site.

The site investigation should be designed with due consideration of the requirements of BS 5930 (2015) Code of Practice for Ground Investigation; Environment Agency (2005), BS10175: 2011+A2:2017 Investigation of potentially contaminated sites – Code of Practice and the UK Specification for Ground Investigation (2nd Edition)

published by ICE Publishing in 2012 and Eurocode - BS EN 1997-1:2004, BS EN 1997-2:2007 'Eurocode 7 - Geotechnical design - Ground investigation and testing'.

After completion of intrusive works and monitoring, the geo-environmental and engineering properties of the ground conditions should be assessed. The soil and groundwater samples and ground gas readings should be analysed for the purpose of risk assessment to human health, controlled waters and assessment of the chemical properties with respect to buried structures and plant uptake.

A ground investigation report should be produced for geo-environmental and geotechnical risk identification and interpretation. Following intrusive investigation and interpretation, proposed mitigation solutions can then be recommended.

6.5 Estimated abnormal costs for proposed mitigation solution

Abnormal costs can only really be revealed after having undertaken ground investigation. Ground investigation would define the level of mitigation and the likely foundation solutions required to facilitate development.

To provide an indication of potential abnormal cost, the high-level desk study information presented in this section has been used to derive potential abnormal costs associated with the potential for contamination (Section 6.3). This has been undertaken in accordance with the Homes and Communities Agency (now Homes England) Guidance on Dereliction, Demolition, and Remediation Costs (March 2015). This methodology was developed by the then Homes and Communities Agency to assess costs of preparing previously developed land affected by contamination. The remediation cost aspects of the method have been used to derive the abnormal costs; demolition costs are not included.

As quite large proportion of the 120 hectares site has a rural/agricultural setting with limited evidence of previous development, the methodology has only focused on determining potential remediation costs for only the areas of potential sources of contamination identified in this preliminary study. This therefore assumes open space and agricultural land with no apparent history of development or without a clear potential contaminant source are not likely to represent a significant contamination source requiring remediation.

The approximate area of the historical railway and potentially infilled clay pit is 8 hectares. On this basis, the range of potential remediation costs associated with this area of the site were assessed to be within the range of £1,876,800 to £4,710,400. Using professional judgement, the likely position within the range has been estimated to be more towards the low end of the range (£1,876,800) but may extend up to the mid-point of the range. It is considered that this should be based on the mid-point of the lowest and middle cost, giving a cost of £2,585,200. The assessment of the range is based on a number of assumptions fixed by the methodology. This assumes that the end use will be entirely residential comprising housing with private garden space and that a moderate (level B) potential for contamination would be present across the entire 8 hectares area. The positioning within the range is based on professional judgement only and it is recommended that a range is considered until such time that intrusive investigations have been conducted to refine this assessment. The estimate could be refined further where precise details can be provided e.g. proportion of area to be considered for public open space and allowances for any other land uses e.g. commercial or community development.

Based on the available information at this preliminary stage it is not possible to attribute a potential abnormal cost for foundations (See Section 6.3.2).

The abnormal cost estimation above does not consider risks from radon or ground gas. This would need to be investigated further and if proven to be a potential risk, should be considered as part of any future re-development design. Radon and ground gas protection measures for a typical residential unit can be estimated on the basis of £80/square metre of ground floor area.

6.5.1 Recommended activities to de-risk site

Investigations/Surveys

It is recommended that a detailed desk study (including a detailed Coal Mining Risk Assessment to inform on the legacy of potential coal mining at the site and an assessment of its potential impact on land stability for the proposed end use) and preliminary intrusive ground investigation and monitoring is undertaken to confirm ground conditions and to identify the location of/prove the presence or absence of any potentially contaminated land. The investigation should be targeted to areas identified to have had a previous contaminative use, as well being sufficient to provide site wide coverage. The ground investigation should be designed with a view to enabling a

robust ground model to be developed upon which a preliminary foundation assessment can be based, tailored to the intended development.

A 5 to 6 month programme is anticipated for detailed desk study (including CMRA) and preliminary ground investigation with costs estimated to be in the order of £200,000 to £250,000 for a combined preliminary geotechnical and geo-environmental assessment.

A radon risk report should be obtained from UK Radon (Pubic Health England) which will serve to confirm and refine the extent of radon risk in areas identified with increased potential.

7. Services / utilities location and capacity

7.1 Existing reports / information referred to

The following information has been obtained to inform the assessment of utilities for the scheme:

- Site visit undertaken by AECOM engineers on 22 May 2020.
- Landmark Utilities Report (Landmark Information Group Ltd) reference 243527607_1.

7.2 Detailed overview

The utilities report identified a number of affected and unaffected utilities on the site, these are discussed below. On the site visit a number of significant utilities constraints were also identified, these included overhead electrical power lines and marker posts for a below ground gas main crossing the site from north west to south east.

7.2.1 Public services/utilities

The following existing utilities are present within the area of the development. **Figure 7.1** indicatively shows areas of major constraints.

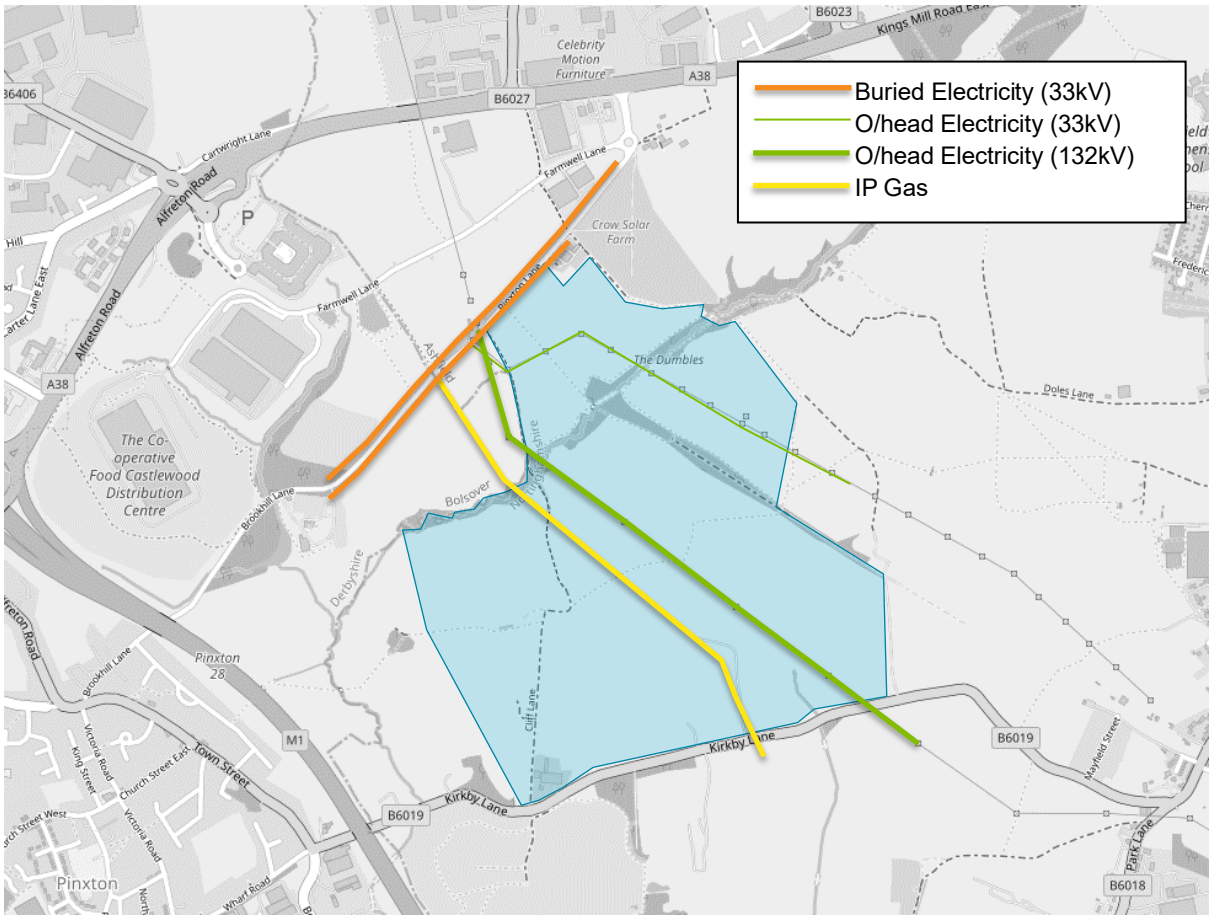


Figure 7.1: Major Utilities constraints

7.2.1.1 Electricity (Western Power Distribution)

There is an electricity substation immediately to the north of the site on Pinxton Lane. This substation has a 132kV overhead line to the south with six towers located within the site. The line crosses the site from the north west to the south east (near the access to Franderground Farm). The total length of overhead line between the substation to the north and the first tower outside of the site to the south is approximately 1.8km.

The full diversion of this overhead line is likely to be a significant cost, and it is recommended that a budget estimate is obtained in order to rule this option out. Where the overhead line cannot be diverted, it will be necessary to maintain a suitable corridor through the site within which no development, and no ground level increases can take place. It should be possible to construct roads beneath the power lines, however these should be approximately perpendicular to the lines where possible, as close to (or slightly below) existing ground and

should consider restrictions to landscape and lighting columns. The overhead lines will form a constraint on the method of construction, and this constraint should be considered when preparing any cost estimates for construction work.

Twin overhead 33kV lines cross the northern part of the site from the substation to the east north of Franderground Farm. There may be more potential for diversion of these to accommodate the layout of the development, however budget costs should be sought to determine the impacts of this option.

There are a series of 11kV cables within the verges of Pinxton Lane to the north of the site (two banks of 3 cables each on the south side and one bank of 3 cables on the north side). These run to the south, towards Pinxton, and therefore are unlikely to be affected by a new access (depending on the extent of the footprint, particularly if it is a roundabout junction).

To the north of the substation, there is one bank of 3No. below ground 11kV cables on the north verge connecting the Crow Solar Farm to the substation, and a below ground 33kV cable extending up Pinxton Lane to the Castlewood Grange development roundabout. There is a below ground LV connection from the Castlewood Grange development roundabout to serve Crow Tree Farm, in the southern verge of Pinxton Lane. All of these are likely to be affected by the new junction and any widening of Pinxton Lane, and therefore consideration and budget cost estimates should be obtained for additional diversion or protection works to these.

To the southern part of the south there are a series of overhead 11kV power lines serving each of the farms, and an overhead LV line along the northern side of the B6019 Kirkby Lane. These will need diverting or taking below ground and should be considered as part of the wider strategy for the layout, supply and phasing of the development.

7.2.1.2 Gas (Cadent)

There is an existing Intermediate Pressure (IP) gas main (P32840 - Annesley / Glapwell / Mansfield) crossing the site from the north, crossing Pinxton lane west of the proposed site. It crosses the site from the northwest to the south east, crossing south of Shire Carr Farm and Pinxton Lane to the south in the area of the access to Shire Carr Farm. The IP gas main was identified on site with marker posts in the field to the north and on the access track to Shire Carr Farm. The main crosses a significant part of the

No information has been provided on the depth or size of the main, it is likely that this will be a constraint on development, therefore it is recommended that, for the purposes of developing a master plan, there is no development over the gas main, and the levels in the location of the gas main are unchanged from existing.

Further enquiries should be made to Cadent gas to determine any required minimum working corridors. It would also be beneficial to get a budget quotation for the diversion of this gas main. Whilst the costs may be significant, it could significantly improve the options available for the development.

There are low pressure mains identified at the industrial unit off Pinxton Lane to the south. There are no gas mains identified connecting to the farms and residential properties to the south or north. It would be beneficial to confirm with these properties if they have a mains gas supply, to determine if there are any utilities not shown on the plans.

7.2.1.3 Potable water (Severn Trent Water)

A three-inch cast iron potable water main is present within the north side of B6109 Kirkby Lane / Pinxton Lane to the south of the development. It is likely that this will need protection or diversion in order to facilitate the construction of a new access in this location.

There is additional water mains noted in the Castlewood Grange Business Park, however whilst in the extent of the search area, these will not be affected by the utilities.

There is no water supply shown to Crow Trees Farm (on Pinxton Road north of the site), or within the main site area in Kirkby Cliff Farm, Shire Carr Farm or Franderground Farm. It is recommended that further investigation is undertaken to determine if these farms have a mains water supply, and if so, where the pipework goes. If they do not have a mains water supply, then it will be essential to identify any private water supply, its source and any associated infrastructure. Earthworks to form a development platform may impact upon the water source or the associated infrastructure.

7.2.1.4 Surface and foul water infrastructure (Severn Trent Water)

The utilities records show no surface or foul water sewers within the immediate vicinity of the site. A further request has been made to Severn Trent Water to confirm the location of sewers in the wider area. It is possible

that surface water from the farms and isolated residential developments is discharged directly to ground or to a nearby watercourse. It is possible that these properties have individual plot only foul, collected in cesspits on site.

7.2.1.5 Telecommunications (Openreach)

There are overhead telecoms lines along B6019 Kirkby Lane / Pinxton Lane to the south of the site, and overhead telecoms lines serving the farms within the site and Crow Tree Farm to the north of the site. It is likely that diversion of the overhead lines to the south will be required to facilitate the construction of a new access roundabout.

7.2.1.6 Other (GTC)

Electrical supply noted within the Castlewood Grange Business Park to the north of the development. This is within the extended search area, but not within the extent of the proposed development.

7.2.1.7 Other (NCC)

Nottinghamshire County Council have road gullies and associated road drainage in both Pinxton Lane (to the north) and B6019 Kirkby Lane / Pinxton Lane to the south – this is discussed in more detail in the drainage section of the report. There are isolated street lighting heads mounted on the telecoms poles within the B6019 Kirkby Lane / Pinxton Lane to the south, and therefore it is likely there is a low voltage power supply to these. There is no evidence of street lighting elsewhere in the area of the site.

7.2.2 Private estate services / utilities

At this stage it is not possible to confirm the demand for utilities as the total number of houses, the form of those houses and the points of connection have not been determined. However, the following sets out the principles which should be considered and, where necessary, the likelihood of major risks to the delivery of the scheme.

The full design will be based on a number of assumptions on the loading / demand for the utilities. These will be significantly affected by the proposed form of the development. For example, the following will need to be defined:

- The proportion and type of electric car points to be installed. There are a range of different charging types, including trickle charges and fast chargers, these can have very different impact on the peak demand loads.
- If property level renewable electricity generation is provided, this will reduce the overall demand on the site.
- Source of heating - electrical, gas, district heating, ground source heat exchange etc. Strategic decisions on the likely heating will affect the demand for gas and electricity.

Any decisions made will need to be sufficiently flexible to allow for the likely significant shift in energy supplies over the life of the development and provide sufficient flexibility for a low carbon offering.

The majority of costs associated with the utility supplies to residential developments are covered by the connection charges and rates, however it is often necessary for a developer to contribute to any off-site reinforcement and in some cases the initial connections to the site. Details of the exact arrangements will depend on the supplier and the phasing of the development.

7.2.2.1 Electricity

Electricity supply to the site is likely to be from the existing substation to a new on-site substation (or multiple substations) serving the development. A pre-development budget cost estimate for supply should be made to Western Power Distribution. The new network of electricity distribution will be within the road corridors.

7.2.2.2 Gas

The strategy for heating will dictate the level of demand for gas services and the need for a mains gas supply. It is recommended that budget estimates for a gas supply are included to provide flexibility for the future use. Given the proximity of the IP gas main crossing the site, it is likely that a supply will be possible, however off-site reinforcement may be required.

7.2.2.3 Potable water

The potable water supply is likely to be from the adjacent water mains; however, the capacity is not known at this stage, and therefore off-site reinforcement of the mains may be required in order to supply the development.

7.2.2.4 Surface and foul water infrastructure

For surface water, refer to Section 8 on drainage.

No details of the existing foul water sewers within the area have been provided by Severn Trent Water, however, it is likely that there will be foul water sewers in Pinxton, Castlewood, the East Midlands Designer Outlet, Bentinck and other local areas. The Kirkby-in-Ashfield sewage treatment works is approximately 500m to the south of the southern boundary of the development site, and if no other infrastructure currently exists, it may be possible to provide a direct connection to the sewage treatment works. The treatment works are at a level of approximately 100m AOD, whereas the site is at approximately 105m AOD to 150m AOD, therefore it may be possible to provide a gravity connection from some of the site, and a pumped section from only the lowest lying areas.

7.2.2.5 Telecommunications

Openreach infrastructure is in the immediate vicinity of the site, which would suggest a connection may be possible, however a formal quotation from Openreach is required to confirm the level of off-site reinforcement. There are currently no Virgin Media FTTP (fibre to the premises) services noted in the immediate vicinity of the site, however FTTP should be explored further to determine the potential for installation of infrastructure to provide high speed broadband connection.

7.3 Risks

The following table summarises the major risks to the development from utilities and recommended mitigation measures:

Table 7.1: Services / utilities location and capacity risks and mitigation

Risk	Impact	Mitigation
Existing overhead power lines (132kV)	Significant constraint on the layout of the development. Likelihood of a significant cost to divert. Impact on construction methodology.	Obtain quotations from WPD for the diversion to consider feasibility. Confirm easements and restrictions to changes in ground level in vicinity of .
Existing below ground intermediate pressure (IP) gas main.	Significant constraint on the layout of the development, not on the same line as the O/H power line. Likelihood of significant costs to divert.	Obtain quotation from Cadent Gas for the full diversion. Confirm easements and restrictions to proximity of proposed properties.
Unknown off-site reinforcement for new supplies.	Whilst all major services are present in the area, new supplies may need off-site reinforcement to provide sufficient supply.	Confirm the loading demand and obtain budget quotes for the supplies.
Sustainable energy strategy	Unknown future demand for power due to changing energy supply models.	Define clear assumptions on the strategic energy supply strategy early in the scheme.

7.4 Estimated abnormal costs for proposed mitigation solution

There are no on site abnormal costs however, there are a number of off-site costs. In terms of power there is a need for a new primary substation to serve 1,611 dwellings at cost of £5,300,000.

There is no specific detail as to whether gas reinforcements will be required therefore an allowance of £1,000,000 is provided for this.

There are no specific details for water or waste therefore it is assumed that reinforcement costs will be paid by the Water Company with no charge to the scheme.

The two overhead power lines could either be accommodated through easements within the design of the site, or alternatively the diversion of these utilities would cost £2,100,000 for the 132kV O/H powerline and £200,000 for the twin 33kV O/H powerlines. For the purposes of the viability testing it has been assumed the power lines are

not placed underground or diverted. In terms of the intermediate pressure gas pipeline it is assumed development will be designed around this as so no diversion costs are allowed.

This results in a total cost of £10,879,000 for utilities including professional fees (£860,000) and design development and construction contingency (£946,000).

8. Drainage

8.1 Existing reports / information referred to

The assessment is made with specific reference to the following documents:

- National Planning Policy Framework (155 – 165)
- The SuDS Manual (CIRIA C753)
- Rainfall runoff management for developments (Environment Agency, Report – SC030219)
- Environment Agency flood risk mapping
- Ashfield District Council Strategic Flood Risk Assessment Level 1
- Chesterfield, Bolsover and North East Derbyshire SFRA

In addition, and in order to guide the assessment, AECOM engineers visited the site on 22 May 2020, and held a preliminary discussion with Deniz McAndrew, Principal Flood Risk Management Officer at Nottinghamshire County Council on 21 May 2020 to establish known issues and aspirations from NCC.

8.2 Detailed overview

8.2.1 Current drainage regime in the area

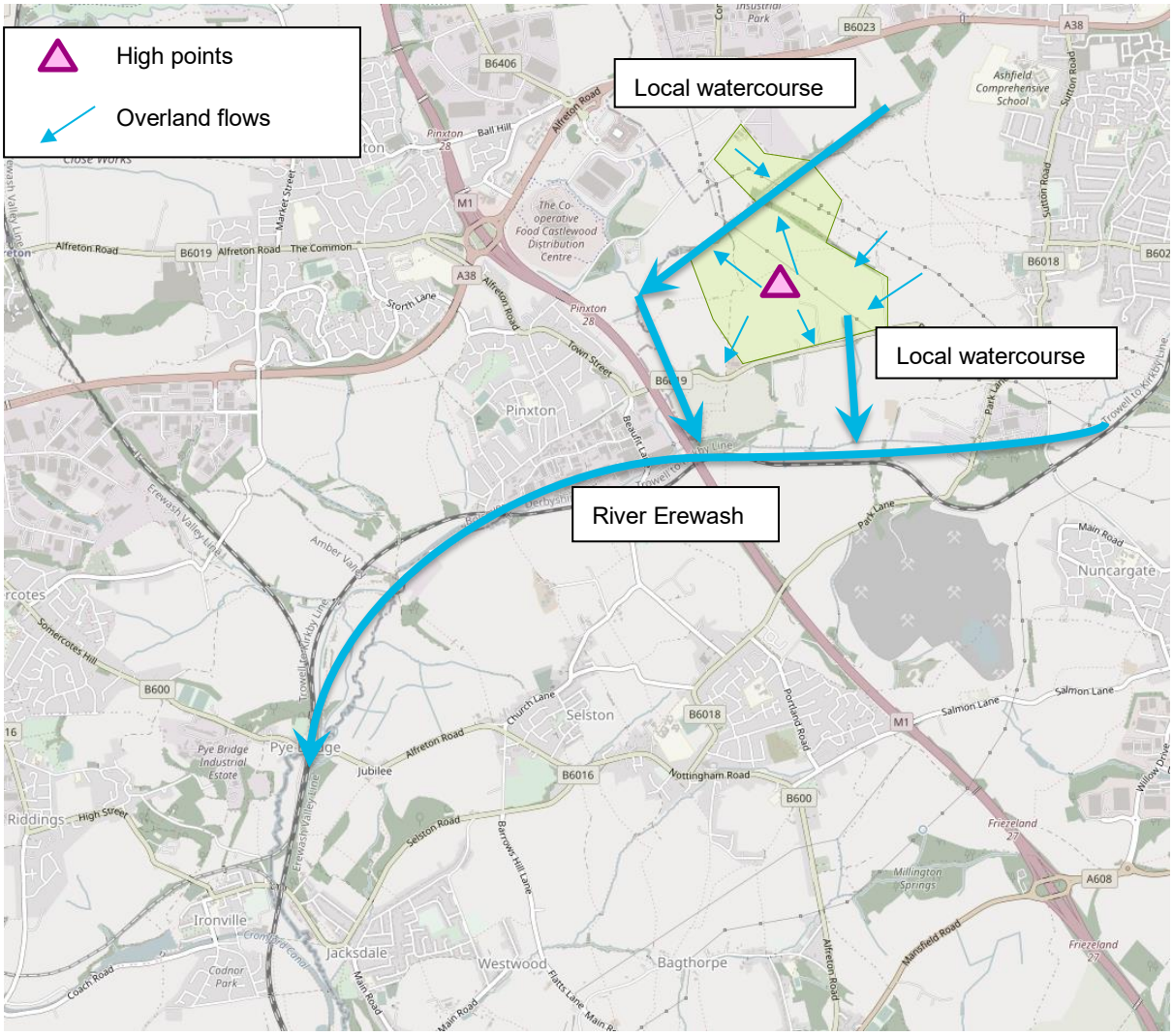


Figure 8.1: Key area-wide surface water drainage features

The land is undulating, ranging in level from approximately 105m AOD at the lowest point to approximately 150m AOD at the highest point to the centre of the development. There is an existing watercourse crossing the site

from the northeast to the east roughly parallel with Pinxton Lane in the north. This is a tributary of Maghole Brook which runs north south adjacent to the M1. The Maghole Brook in turn outfalls into the River Erewash in Pinxton to the south west of the site.

A second water course runs from north to south in the area of Franderground Farm to the south east of the site. It is a direct tributary of the River Erewash.

There are a number of additional field drains and land drains around the site which follow the contours of the land and outfall into the two main watercourses discussed above. The whole site is within the catchment of the River Erewash.

The Ashfield Strategic Flood Risk Assessment identifies the Risk of flooding to areas downstream of Ashfield from the River Erewash as one of the main flood risks in the area, particularly flooding in Pinxton and Jacksdale, both of which are downstream of the site. Therefore, the impact of any new development on the flow within the River Erewash will be of critical importance to the management of flooding in the area.

The flood mapping shows the whole site is in Flood Zone 1, therefore the proposed use of the site as residential is appropriate. Any flood risk assessment and drainage strategy developed for the site therefore needs to focus on reducing the impact of the development on flooding to areas downstream.

8.2.2 Proposed surface water drainage

Initial calculations for the greenfield runoff rate and estimated total storage volume required have been obtained from the uksuds.com website. In running the calculations, the total area of 117ha has been used. It is assumed that approximately 25% of the site (30ha) will be retained as significant open space (parkland, woodland etc); these areas will not have positive drainage (i.e. no gullies, new ditches or surface water pipework) and therefore area excluded from the calculations. It is also assumed that the development will be only 70% impermeable (allowing for permeable areas such as back gardens and soft landscape areas within the residential parcels of land). These percentages have been taken from previous schemes of a similar size and nature, however they should be confirmed as part of any detailed assessment and developing master plan.

The calculations show that the total Q_{BAR} for the site is 544 l/s and the total storage volume required is 47,000 m3. Following SuDS guidance, the maximum depth of water in an attenuation storage structure should be 2 m in the most extreme cases, but typically it is better to design to between 1.2 m to 1.5 m depth. Therefore, the total area of land that should be allocated for storm water attenuation is between 3 ha and 4 ha. This should be split across the site to provide areas for local source control, and areas near the lowest parts of the site to allow for regional attenuation.

The steep nature of the site means that forming a level attenuation pond may require additional earthworks, and therefore the area of land required may be larger.

Figure 8.2 shows an indicative strategy for the drainage. This is based upon regional attenuation at the low parts of the site, the size of which will be affected by the layout of the site, the locations of significant open space, the proposed levels, and the amount of source control which can be provided.

In the absence of detailed ground information or soakaway tests, the use of infiltration systems has not been considered. If ground investigations and soakaway tests can demonstrate that infiltration systems are appropriate at the site, then the volume of attenuation can be reduced.

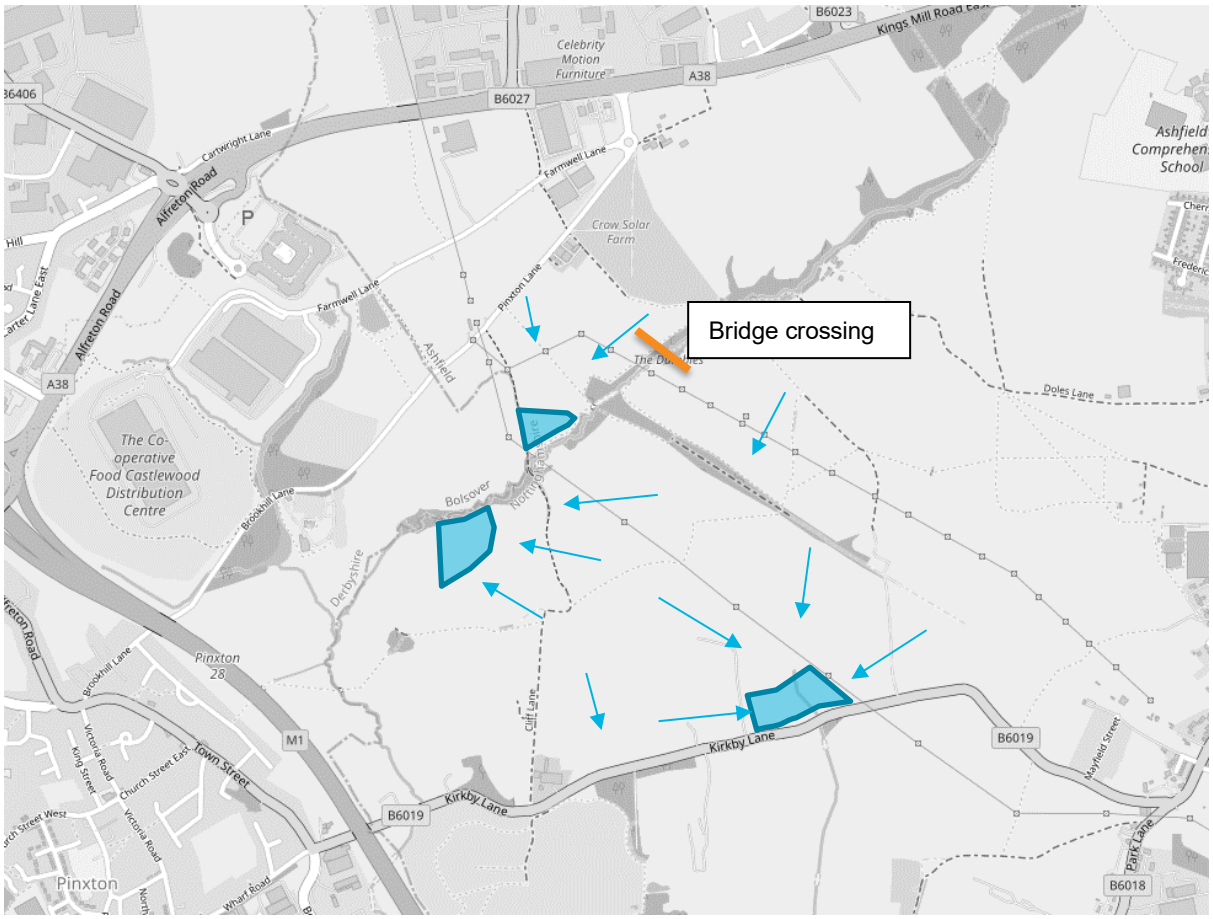


Figure 8.2: Indicative drainage routes and regional attenuation

8.2.3 Localised details

Existing gullies existing in Pinxton Lane (north of the site) and in the B6019 Pinxton Lane / Kirkby Lane (south of the site). These will need to be modified, or moved, as part of the formation of any new access junctions.

Any existing overland flow through field / land drainage will need to be considered as part of the development, and the phasing of the site will need to be co-ordinated in order to maintain continuity of flow as the development progresses.

8.2.4 Flooding from rivers and other sources

Whilst the site is in a Flood Zone 1 from river flooding, mapping of surface water flooding (Flood Risk Maps for Surface Water in England - December 2019) shows a 1:30 year risk of surface water flooding along the water courses identified above, with a wider extent of 1:100 year and 1:1000 year risk of flooding (typically 15m to 20m either side of the watercourse. This will limit the areas of development land, and level increases adjacent to the main watercourse should be avoided, to reduce the risk of restricting the flow.

In order to provide a highway connection from the southern part of the site to the northern part of the site, a bridge or culvert crossing of the existing watercourse will be required. The form of and size of this structure will be dependent upon the proposed levels, the design use and the exact location. As part of the design of this structure, consideration will be required to maintaining the watercourse and land for the extent of surface water flooding. A model of the flood routing will be required to demonstrate that the development and bridge do not increase the risk of flooding upstream of to the new development. An indicative location of a bridge is included in **Figure 8.2** where the extent of flooding is least and away from the major utilities constraints.

8.3 Risks

The key risks to the development from flooding are

- Surface water flooding immediately adjacent to the existing watercourses.

- The requirement for significant areas of land to attenuate the flow in order minimise the risk of flooding downstream.
- The requirement for a design of the residential areas which incorporates source control SuDS features where possible and in accordance with the SuDS manual.
- A strategy for the future adoption of any SuDS features should be agreed early in the scheme and the future maintenance costs considered.
- The requirement for a bridge over the watercourse with a clear span to minimise the impact on surface water flood routes. The location may be constrained by the existing utilities and whether they are relocated or can be accommodated in the design of the structure.
- In the absence of detailed ground information or soakaway tests, the use of infiltration systems has not been considered, these may be appropriate.

8.4 Proposed mitigation solution

The mitigation for the general drainage constraints will be through early design of the proposed landform, clarity of the extent of development (impermeable area) and preparation of a model for the surface water flow routes. It is not considered that any of the constraints listed are showstoppers, however the steep areas of the site may limit the scope for larger regional attenuation, and therefore detailed consideration of source control (e.g. roadside swales, filter strips and bioretention systems within the residential areas should be considered.

Any ground investigation of the site should include assessment of the suitability of the site for soakaways as the use of soakaways would reduce the need for attenuation features.

The highway layout within the site needs to include consideration of the preferred location for a bridge crossing of the existing watercourse and should be followed by modelling of the ground and watercourse to determine the size of the opening required on the bridge.

8.5 Estimated abnormal costs for proposed mitigation solution

No abnormal costs identified.

9. Historic environment

9.1 Existing reports / information referred to

- National Heritage List for England[26];
- National Library of Scotland for historic Ordnance Survey maps[27];
- Ashfield District Council Interactive map[28];
- Ashfield District Council 2004. *Kirkby Cross Conservation Area Appraisal*[29];
- Nottinghamshire Historic Environment Record (HER) access through Heritage Gateway[30]; and
- The Coal Authority interactive map[31].

9.2 Detailed overview

There are no designated heritage assets within the Site boundary. There is one Locally Listed building within the Site boundary, Cliff Farmhouse and Cart shed.

There are no World Heritage Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas within a 500m Study Area of the Site boundary. There are two grade II listed buildings within a 500m Study Area of the Site boundary; Brookhill Hall (NHLE 1335430) and the associated Stable block at Brookhill Hall (NHLE 1108924).

The nearest Scheduled Monuments are those of Pinxton Castle motte and fortified manor (NHLE 1010025) 800m north-west of the Site boundary, Castle Hill fortified manor (NHLE 1009298) 1.1km east of the Site boundary, and Fishponds 220m east of St Wilfrid's Church (NHLE 1020374) 1.3km east of the Site boundary.

The study area and the immediate vicinity contain evidence of prehistoric activity, and clear evidence of occupation from the Roman period onwards. The Nottinghamshire HER lists a number of lithic scatters recorded in the area as well as undated enclosure immediately north-east of the Site Boundary and a few isolated flakes scattered throughout the area. A possible Romano-British field system has been identified 300m north of the Site boundary, suggesting that the Site lay within an agricultural landscape from at least that period onwards. The medieval period is very well attested throughout the study area and beyond. The Pinxton motte and bailey castle 800m north-west of the Site boundary, the settlement of Pinxton Green 800m west of the Site boundary, and the medieval settlement of Kirkby-in-Ashfield 1km to the east certainly confirm this. It is likely that the Site lay within the agricultural hinterlands of these settlements throughout the medieval period.

The Site is located on the eastern edge of extensive coal mining resources and as such the region witnessed rapid industrial and economic development in the late post-medieval period. A number of collieries are recorded within the study area. The Coal Authority lists a number of closed historic adits and coal mine entries immediately outside the Site boundary and several coal seams crossing the area. The Site is likely to contain post-medieval and modern remains related to the development of the coal industry.

The First Edition Ordnance Survey map (1879) shows the Site to have been completely agricultural in the late 19th century, the only built elements being Cliff Farm and Kirkby Cliff Farm at the south and north ends of Cliff Lane respectively and two pairs of semi-detached cottages, now Nos. 1,2 and 3 Cliff Lane. This situation changed in the 1890s when the Great Central Railway's Derbyshire Lines were driven through the Site on a north-west to south-east alignment necessitating the excavation of a cutting and construction of an embankment within the area covered by the Site. A branch line to Langton Colliery ran to the south of the Site, south of the B6019 Pinxton Lane.

A new farm, Shire Carr Farm appears for the first time on the 1900 Ordnance Survey map. The 1916 Ordnance Survey map is the first to show the avenue of trees running in a south-easterly direction from Brookhill Hall

[26] Available at: https://historicengland.org.uk/listing/the-list/
[27] Available at: https://maps.nls.uk/
[28] Available at: https://www.ashfield.gov.uk/residents/planning-building-control-and-land-charges/forward-planning/historic-environment/)
[29] Available at: https://www.ashfield.gov.uk/media/2202/kirkby_cross_conservation_appraisal_2004.pdf)
[30] Available at: https://www.heritagegateway.org.uk/
[31] Available at: https://mapapps2.bgs.ac.uk/coalauthority/home.html

towards the Site. The avenue is shown to terminate in a roughly circular area of wooded parkland, part of which is located within the Site.

Fields within the Site were amalgamated in the late 20th century to make larger fields by removing hedgerows. The railway closed in 1963 and the cutting and embankment on which the line ran is now wooded.

9.2.1 Nationally listed and scheduled assets

None within the Site boundary, Brookhill Hall (NHLE 1335430) and the associated Stable block at Brookhill Hall (NHLE 1108924) within a 500m Study area of the Site boundary.

Brookhill Hall (NHLE 1335430) is located approximately 480m north-west of the Site boundary. The hall is an early 17th century house which was extended in the early 18th and 19th centuries and altered in the late 19th century. Construction of the two and three storey house is of squared stone, rubble and red brick with ashlar dressings and stone roofs.

Despite the extensive modern development to the north and west of Brookhill Lane the hall has retained the parkland/woodland setting it enjoyed in the 19th century, including the large Halfmoon Pond shown on Ordnance Survey maps of the time. The associated Maghole Pond is shown on historic Ordnance Survey maps to the south-east of Halfmoon Pond but now appears to be wooded. The avenue of trees running to the south-east of the hall does not appear on Ordnance Survey maps before 1916.

The Stable block at Brookhill Hall (NHLE 1108924) is located approximately 40m north of the hall. The block dates from the early 19th century and was converted to residential accommodation *c.* 1970. Construction is of red brick with brick and stone dressings and a slate roof. The building is two storeys high with a three-storey tower in the centre of the main, south range. The building's setting is the hall and its parkland, the kitchen garden to the north appears to have retained its walls but is overgrown.

There are no conservation areas within the Site boundary, the nearest is Kirkby Cross Conservation Area which was adopted by Ashfield District Council in September 2004. The settlement of Kirkby Cross dates at least to the 8th century and is mentioned in the Domesday Book of 1086. The conservation area takes in the historic core of the village centred on Church Street and Chapel Street and also includes an important medieval landscape to the south and east of the Church of St Wilfred. The conservation area takes in 16 grade II listed buildings including Kirkby Cross (also scheduled) and two further scheduled monuments, Castle Hill Manor (NHLE 1009298) and the associated Fishponds 220m east of St Wilfrid's Church (NHLE 1020374).

The closest scheduled monument to the Site is Pinxton Castle motte and fortified manor with moated site and five fishponds (NHLE 1010025) which is located approximately 800m west of the north-west corner of the Site just south of the A38 Alfreton Road.

The closest Registered Park and Garden to the Site is the grade II* listed Annesley Hall (NHLE 1001077) approximately 3.5km to the south-east.

9.2.2 Locally Listed assets

There is one Locally Listed built heritage asset within the Site boundary, Cliff Farmhouse and Cart Shed which appears on the First Edition Ordnance Survey map of 1879. The asset is located in the south-west corner of the Site at NGR 446967, 355380 at the junction of Kirkby Lane and Cliff Lane. The 19th century or earlier two storey house has a rear addition to its west side and a rear catslide to its east side. It is built of stone blocks, rendered at the gable ends with casement windows, tiled roof and brick chimney stacks at the gable ends. The castellated south porch may be a later addition.

There are three further Locally Listed buildings within a 500m study area of the Site boundary. York Lodge (Local Heritage List No. 195) is located approximately 150m west of the Site boundary to the north of the B6019 Kirkby Lane at NGR 446722, 355383. The asset is in the same location as a building shown on the First Edition Ordnance Survey map of 1879 to the east of Kirkby Old Hall.

Langton Hall Farm is located to the south of the B6019 Kirkby Lane at NGR 447301, 355227. The present Langton Hall is a Georgian building but may incorporate older fabric and certainly has older origins. The building was at one time listed but is now de-listed. The Outbuildings & Farm Buildings at Langton Hall appear on the Local Heritage List as Ref. 344. The farm complex is shown on the First Edition Ordnance Survey map of 1879 and a number of the buildings shown remain. Langton Hall was associated with Langton Colliery to the south, the

mine has closed but the post-Second World War office buildings remain to the east of the asset. Despite the presence of these modern buildings the asset retains a large proportion of its agricultural setting.

Franderground Farm (Local Heritage List Ref. 403) is located approximately 50m north of the Site at NGR 447895, 356104. The asset appears on the First Edition Ordnance Survey map of 1879 as a courtyard complex and a number of the buildings remain.

9.3 Risks

Development to the north of the B6019 Kirkby Lane will change the setting of Kirkby Cross Conservation Area as it is approached from the west. The village is approximately 50m higher than the land to the west and the spire of the Church of St Wilfred can be seen from the road to the south of the Site. There is however a considerable stretch of agricultural land between the Site and the western part of the village and while the Site may be visible from some parts of the conservation area in distant, glimpsed views it is not considered that the change in setting will diminish the area's significance. The Site is not within the setting of the three scheduled monuments located within the conservation area.

The Site is not within the settings of the closest Registered Park and Garden to the Site, Annesley Hall or the closest scheduled monument to the Site, Pinxton Castle.

The two listed buildings within the 500m Study area, Brookhill Hall and Stable block at Brookhill Hall are well screened from the Site by vegetation and at almost 500m distant it is not considered that development on the Site would undermine their significance. At present the Site comprises an area of approximately 0.6 hectares within the Site boundary just to the west of Kirkby Cliff Farm. This area was once the termination of the avenue proceeding south-east from Brookhill Hall and consideration should be given to redrawing the Site boundary to protect the integrity of the landscape.

There is a slight risk of successful applications for statutory listing of the four Locally Listed Buildings, one within the Site boundary and three within the 500m Study area. Of these it is considered that York Lodge, the Outbuildings & Farm Buildings at Langton Hall and Franderground Farm are sufficiently well screened from the Site that any harm as a result of development would be less than substantial at worst and the harm would be offset by the public benefits of the scheme. The slight possibility of the assets being statutorily listed is not therefore considered to present a high degree of risk.

The Locally Listed Cliff Farmhouse and Cart Shed are located within the Site and although they are screened from the majority of the Site by modern farm buildings their significance depends on their current agricultural setting. Should the asset be listed, development on the Site that took away that setting may constitute substantial harm and pose a threat to an application. As a Locally Listed building it is recommended that the building is preserved in the scheme design and a buffer zone placed around it to the north and north-east to preserve at least some of its setting.

Kirkby Cliff Farm, Nos. 1, 2 and 3 Cliff Lane and Shire Carr Farm all appear on historic Ordnance Survey maps but are not Locally Listed. There is a slight risk of applications for Local Listing of the buildings prior to application.

The preliminary overview has identified some potential for archaeological remains to be present within the Site dating from the prehistoric period onwards. Given that much of the Site lies within agricultural fields which have been subjected to minimal ground disturbance in the post-medieval and modern periods, any archaeological remains present are likely to be relatively well preserved. Nottinghamshire's Archaeological Advisor is likely to require an archaeological evaluation carried out ahead of construction to identify, characterise, and assess the significance of any non-designated archaeological assets present within the Site. Should investigations uncover significant archaeological remains, there is a further risk that the council may require these to be recorded through archaeological excavations to a level commensurate with their significance.

9.4 Proposed mitigation solution

It is proposed that a Heritage Statement be completed in support an application for development of the Site. This Heritage Statement will take special consideration of the potential effects of the proposed development on the setting of the historic buildings and its impacts on the potential archaeological resource. This would be replaced by EIA scoping, desk-based assessment and ES chapter if the development is determined to be an EIA development.

Risks posed by built heritage can be mitigated by including the Locally Listed Cliff Farmhouse and Cart Shed into the proposed scheme. Should a scheme involving the demolition of the building be adopted a comprehensive scheme of Historic Building Recording should be offered as mitigation.

To avoid the possibility of applications for statutory listing of the building an application for a Certificate of Immunity could be considered. This carries with it a risk that the building becomes listed as part of the process but if successful would mean the building cannot be considered for listing for a further five years.

To better understand the likelihood of applications for the Local Listing of Kirkby Cliff Farm, Nos. 1, 2 and 3 Cliff Lane and Shire Carr Farm being successful a Statement of Significance could be carried out for the buildings.

Should the Heritage Statement reveal that there is a high potential for archaeological remains to be impacted by the scheme, it is proposed that consultation with Nottinghamshire's Archaeological Advisory be carried out to establish any requirement for archaeological investigations. These works would be aimed at confirming the presence and assessing the significance of the resource within the proposed development through a programme of archaeological trial trenching or monitoring. Should these investigations uncover significant remains that would be adversely impacted by the scheme, an archaeological excavation may be required to record the remains prior to development.

9.5 Estimated abnormal costs for proposed mitigation solution

An application for a Certificate of Immunity is made online and should include supporting information in the form of a Heritage Statement containing a comprehensive history of the building, and a detailed description of its historic and architectural interest explaining the evidence for, and interpretation of, its development and phasing. The Heritage Statement should include documentary evidence such as historic maps, images and research reports. In addition, the archaeological assessment for the site can be incorporated in the Heritage Statement. This would cost in the region of £10,000.

The cost of historic building recording would depend on the level of recording agreed with the LPA. If this was agreed at Level 2 for Cliff Farmhouse and Cart Shed it would attract costs in the region of £6,000.

A Statement of Significance for the non-designated Kirkby Cliff Farm, Nos. 1, 2 and 3 Cliff Lane and Shire Carr Farm. This would contain a history of each building, documentary evidence in the form of historic maps and images and a description of its historic and architectural interest and would attract a cost in the region of £5,000.

Based on the size of the development and the potential archaeological resource present within the Site, estimated indicative costs to carry out an archaeological evaluation, including both geophysical survey and trial trenching, is approximately £100,000. Costs for any additional mitigation work cannot be provided until the presence, preservation, and significance of the archaeological resource within the Site is assessed by an archaeological evaluation.

10. Landscape

10.1 Existing reports / information referred to

- Site visit June 2020
- Greater Nottingham Landscape Character Assessment (2009)

10.2 Detailed overview

The Greater Nottingham Landscape Character Assessment 2009[32] provides a way of assessing the varied landscape within Greater Nottingham and contains information about the character and condition of the landscape to provide a greater understanding of what makes the landscape within Greater Nottingham special.

The study has recognised this through the identification of 79 Draft Policy Zones (called Landscape Character Types within Erewash Borough). The Draft Policy Zones identify how well the landscape character areas could adapt to change without severe detrimental effect on their character and integrity; and provide guidance on how to protect special landscapes and improve less special landscapes.

The following Draft Policy Zones is relevant to Site 1: NC05. Kirkby Coalfield Farmlands/Kirkby Vales

Table 10.1: Draft Policy Zone affecting Site 1

Pinxton Lane
NC05 – Kirkby Coalfield Farmlands/Kirkby Vales
Strongly undulating landform. Semi-rural character – urban elements surrounding the area are prominent. Land use is agricultural (pastoral and arable). Field sizes are medium-large and geometrically shaped. Hedgerows, typically containing trees, border fields and are generally well maintained. Woodland is typically linear and follows the base of slopes, watercourses and railways. The Dumbles is a strong feature. Enclosed views on lower ground but with extensive panoramic views from upper slopes to the south east. Overhead lines and major roads (M1 and A38) are prominent features.
The landscape condition is **MODERATE**. Hedgerows are generally intact and well managed, although woodland at The Dumbles seems overgrown and unmanaged in places. The agricultural land is managed largely for modern farming and there is some evidence of field boundary hedge removal to increase field size, although irregular field boundaries following landform remain features of this DPZ.
The character strength of this area is **MODERATE**. Landform is distinctive and a consistent feature in the landscape. The land use pattern of agricultural land is also consistent with scattered individual farms. Linear woodland is a significant landscape. The overall landscape strategy is **ENHANCE**.
• Conserve the distinctive pattern of undulating land with linear woodlands • Conserve the irregular field patterns following landform • Conserve ‘natural’ woodlands and increase species diversity of any new woodlands. New woodlands should primarily comprise native broadleaf species • Conserve and enhance ongoing management of The Dumbles woodland and watercourse as significant landscape features • Conserve hedgerows and encourage infill planting within gaps • Enhance woodland and hedgerow planting adjacent to road corridors to provide long term screening • Conserve the undeveloped nature of the majority of the area and seek to reduce the effects of surrounding urbanising features by the establishment of linear woodland and reinstatement of hedgerows and hedgerow trees • Conserve the pattern of scattered farmsteads and outbuildings throughout the landscape. Any new agricultural developments should fit within the existing development pattern and avoid prominent locations on high ground • Enhance views north by introducing woodland/tree cover to filter views of new industrial development

The site has an uneven topography and slopes down from a ridgeline which runs north-east to the centre of the site. To the north there is a stream called The Dumbles, which forms a shallow depression in the topography. The area is overall elevated, with some long views to the south. It has a low landscape sensitivity yet a medium visual sensitivity owing to the long views available to the south from the eastern edge of the site, as well as from the north west across the site.

The context of the site is predominantly rural, comprising agricultural fields and some equestrian land use. However, there are some detracting features locally such as the industrial estate to the north of the site, and the disturbed land to the south. The woodland running through the northern half of the site forms part of a local

[32] Available at: https://www.ashfield.gov.uk/media/4967/greater-nottingham-landscape-charater-assessment-ashfield-part-only.pdf

wildlife site, however there are few other conservation interests within the surrounding context and therefore has a low landscape sensitivity. The site also contains several public rights of way, including a bridleway and several footpaths. In terms of perceptual aspects, there are several influences in the surrounding area such as the M1 and several industrial areas which degrade the overall perceived experience resulting in medium landscape planning issues.

The south-eastern edge of the site is more enclosed by vegetation, with visibility limited to immediately adjacent roads where roadside vegetation allows. The stream known as The Dumbles flows east-west through the site and, with associated vegetation forms a green corridor. This is met in the centre of the site by the woodland associated with the disused railway line which runs south-west to north-east and forms a secondary corridor. There are opportunities to connect the woodland along the disused railway line to the woodland block just west of Franderground Farm. The area around the site has a coal-mining heritage which can be picked up in the design of new development.

10.3 Risks

The areas to the north, east and west of the site are relatively built up, with some industrial and commercial areas present. Therefore, development of the site has the potential to result in perceived sprawl, particularly to the south-east of the site. Kirkby Lane and Pinxton Lane both form defensible boundaries, as does the dismantled railway line. The rest of the site edges are formed by field boundaries. The proposed route of HS2 follows the western edge of the site. It will form a strong defensible boundary and likely screen views to the M1 but will also have the potential to increase perceived urbanisation in the surrounding area.

10.4 Proposed mitigation solution

The site is potentially suitable on landscape grounds, however a landscape buffer is recommended in the far south-eastern corner of the site, where the more open views are located. It would be desirable to retain the green corridor associated with The Dumbles within any new development.

10.5 Estimated abnormal costs for proposed mitigation

None identified

11. Social infrastructure

11.1 Existing reports / information referred to

A number of reports and documents have been referred to and used to inform both the baseline analysis, mitigation recommendations and to understand the social infrastructure context within Ashfield District and the surrounding areas. The key reports referred are:

- Ashfield Local Plan (2002)
- Nottinghamshire County Council Pupil Place Planning and School Capacity (2017)
- Nottinghamshire Children and Young People's Departmental Strategy 2019-2021
- Ashfield District Council Infrastructure Delivery Plan (2016)
- Nottingham Outer Strategic Housing Market Assessment (2015)

Furthermore, publicly available data sources drawn from social infrastructure providers were used to establish the baseline provision surrounding the Site.

11.2 Detailed overview

11.2.1 Nurseries

The following key findings can be seen from the baseline data available:

- There are 25 nursery/daycare settings within a 5 mile impact area of the site.
- Catchment requirements for nursery provision would put the majority of the identified capacity out of the reach of residents of the Site and would suggest therefore than on-site provision will be necessary to mitigate the development.

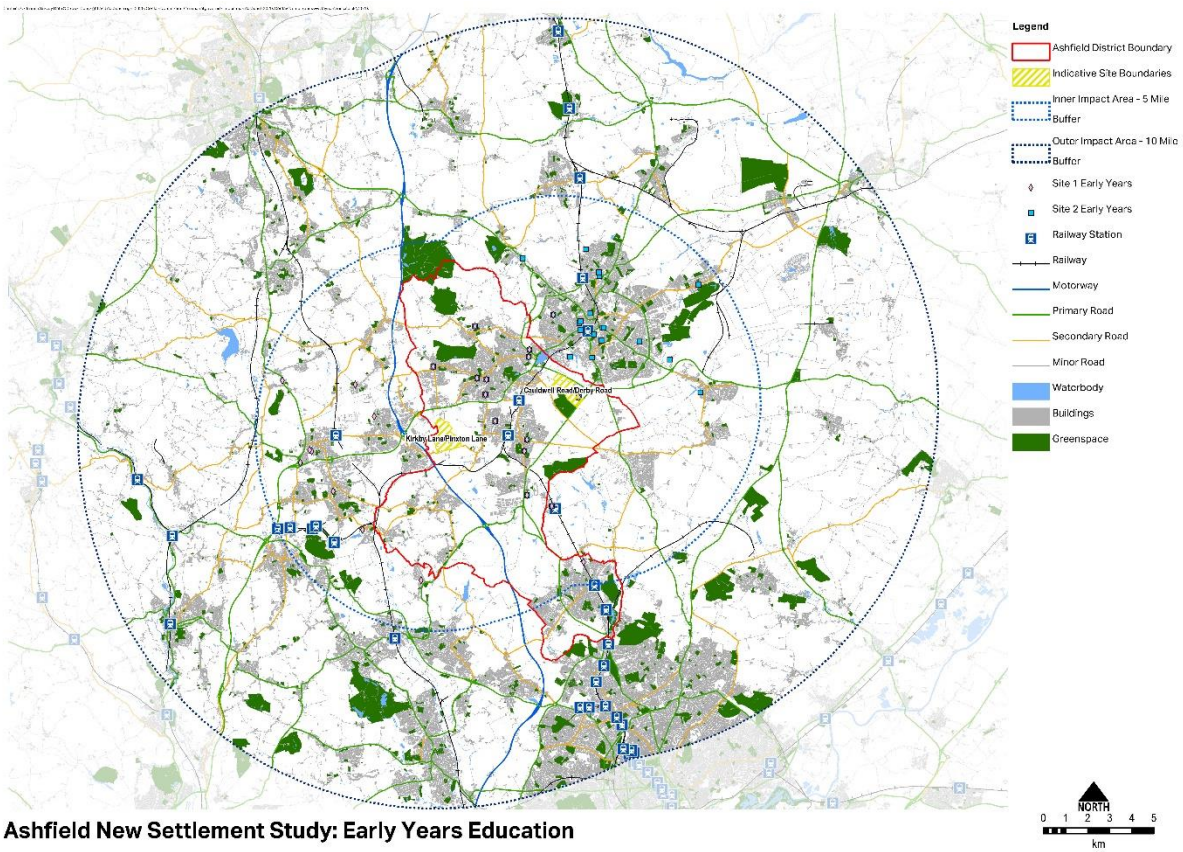


Figure 11.1: Baseline Provision and accessibility to Nursery Provision

11.2.2 Primary education

The following key findings can be seen from the baseline data available:

- There are currently 65 primary schools within 5 minute drive of the Site
- Current roll numbers against capacity suggests a significant deficit in total place capacity across the existing schools. This is the case both for the inner and outer impact area.
- There are some individual exceptions however with some spare capacity in the inner impact areas seen in Blackwell Community Primary School, Sutton Road and King Edward Primary School There is also some spare capacity in schools further to the south of the Site.
- Whilst baseline research indicates some localised capacity at certain primary schools, overall data suggests that on site provision will be required to mitigate the primary school impacts from the development.

Table 11.1: Baseline Provision of Primary Schools

	Primary Schools	Capacity 2019 data	Number on Roll 2019 data	Surplus / Deficit Places
Inner Impact Area	65	18,826	19,281	-455
Outer Impact Area	379	103,746	103,530	216
Total	444	122,572	122,811	-239

Source: DFE – Edubase 2019

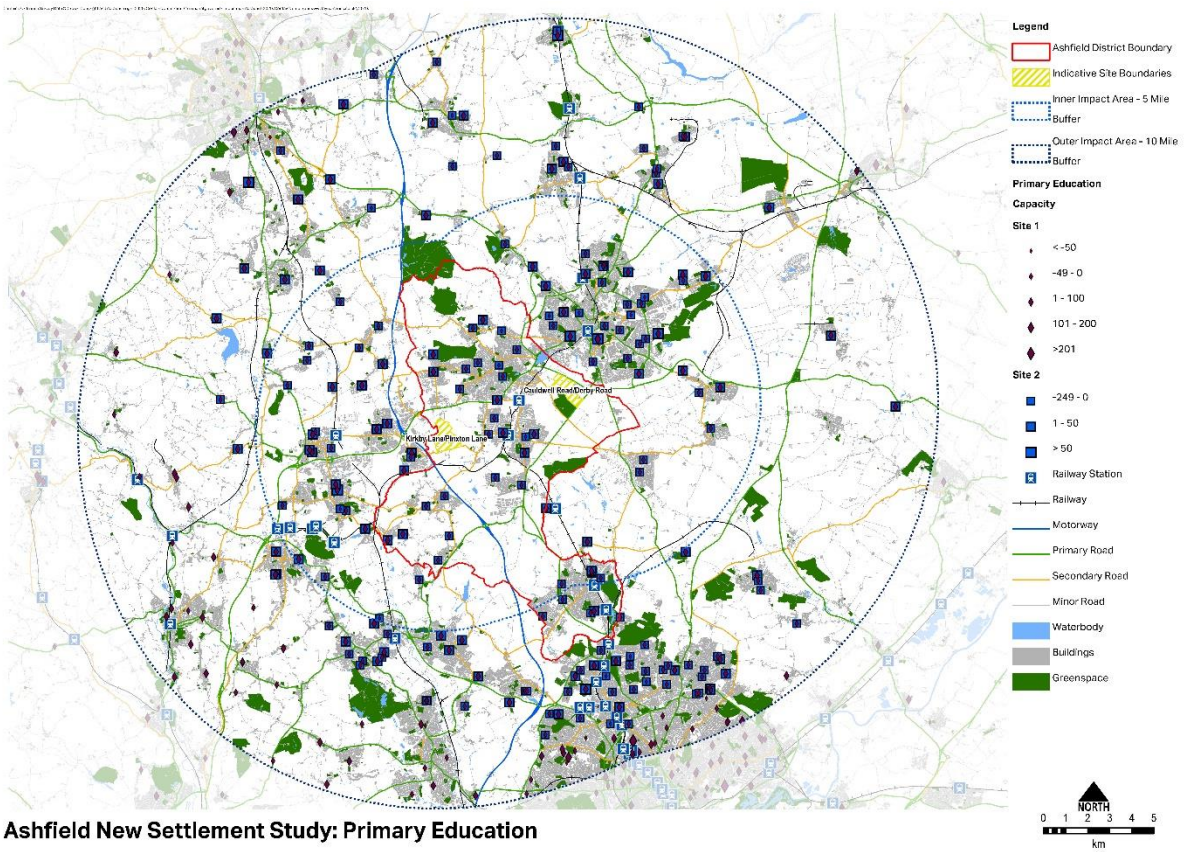


Figure 11.2: Baseline Provision and accessibility to Primary School Provision

11.2.3 Secondary education

The following key findings can be seen from the baseline data available:

- Due to the larger catchment of secondary schools, an outer impact area is applicable to the analysis of baseline provision. There are 84 secondary schools identified within a 15 minute drive time of the Site.
- Across the outer impact area there is a spare provision of 10,990 places. It is important to note however that this does not take into account the statutory requirement to operate a 5% contingency in capacity. It should be noted that this spare capacity also represents the total for all years and does not necessarily represent that level of spare provision at pinch points such as year 7 intake.
- Baseline research suggests that off-site provision has the potential to mitigate the secondary school impacts from the development.

Table 11.2: Baseline Provision of Secondary Schools

	Secondary Schools	Capacity 2016 data	Number on Roll 2016 data	Surplus
Total	84	96,429	85,439	10,990

Source: Edubase, 2019

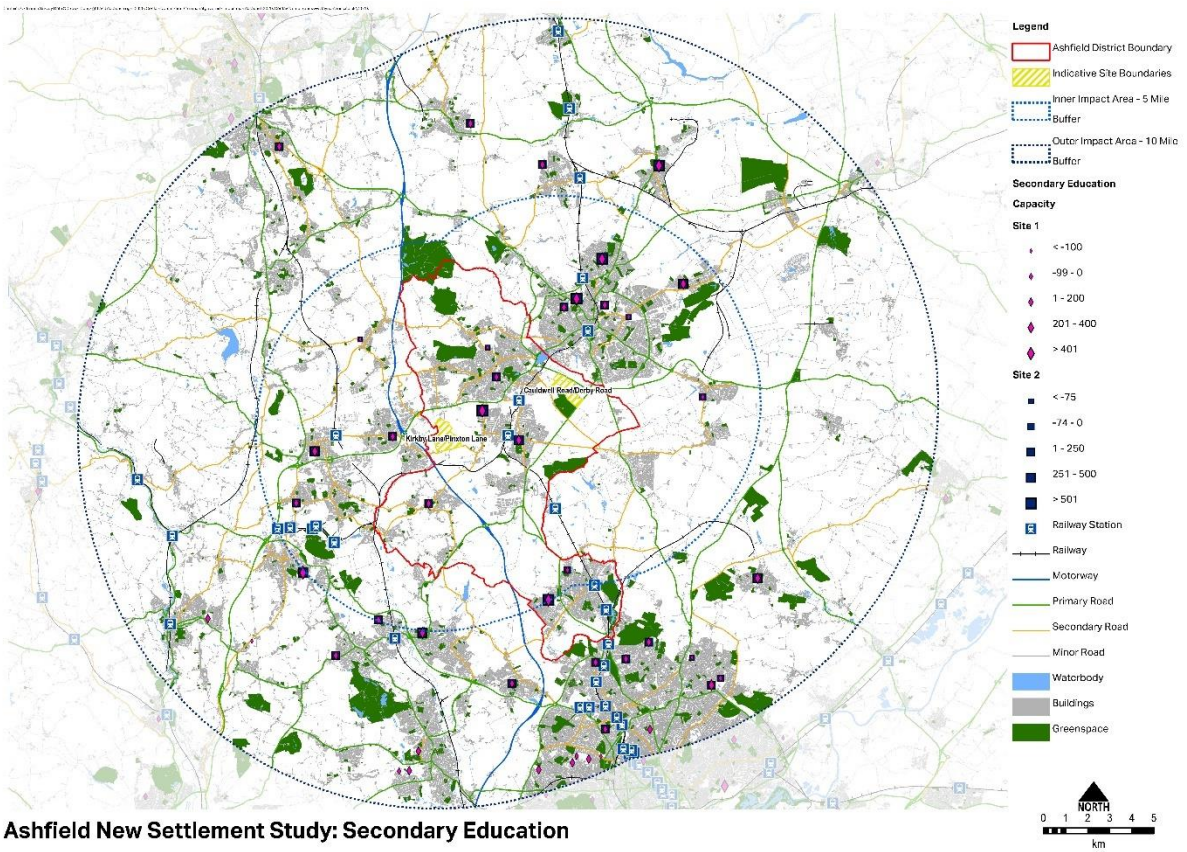


Figure 11.3: Baseline Provision and accessibility to Secondary School Provision

11.2.4 Primary healthcare

The following key findings can be seen from the baseline data available:

- Clinical Commissioning Groups (CCG) are responsible for primary care and the Site is covered by the NHS Mansfield and Ashfield CCG.
- The wider area around the site is shown to have 35 GPs providing services for 295,687 patients operating with a patient per GP ratio of 1: 2,025.
- There are localised capacity issues for individual GP practices, however at an area wide scale there is a deficit in capacity of 32,887 patients.
- Consultation with the NHS Mansfield and Ashfield CCG is required to confirm the Site and capacity data presented and the preferred strategy for mitigating healthcare requirements from the development.

Table 11.3: Baseline Provision of GPs

	Number of GP Locations	Patients on GP Lists	GPs	Patients per GP
10 mile Impact Area	35	295,687	146	2,025

Source: GP Workforce England, NHS, June 2019; Registered Patients, NHS, June 2019

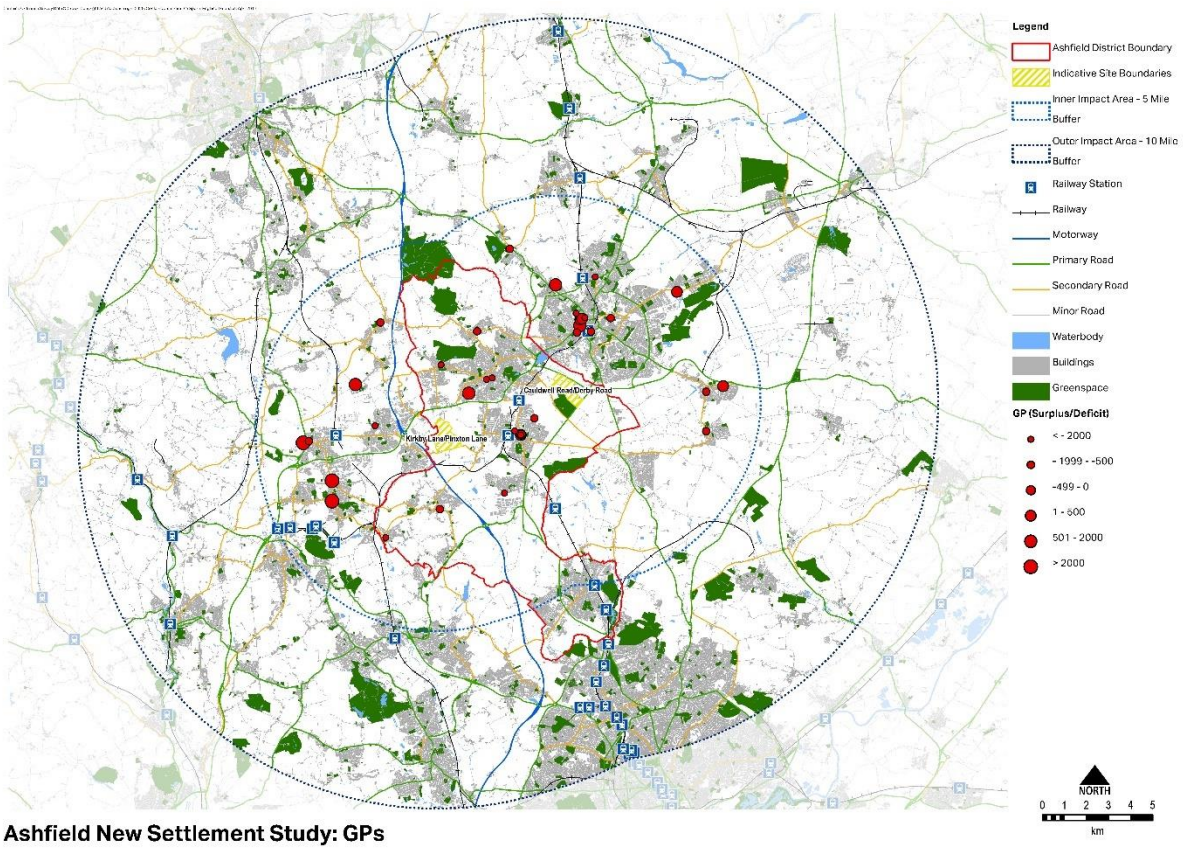


Figure 11.4: Baseline Provision and accessibility to GP Provision

11.2.5 Hospitals

The following key findings can be seen from the baseline data available:

- The closest acute hospitals with Accident and Emergency services are the Ashfield Community Hospital, King's Mill Hospital and Mansfield Community Hospital within 5 miles of the Site.
- The nearest NHS hospital to the Site is King's Mill Hospital. This hospital is home to a variety of walk in services and outpatient clinics.

Table 11.4: Baseline Provision of Hospitals

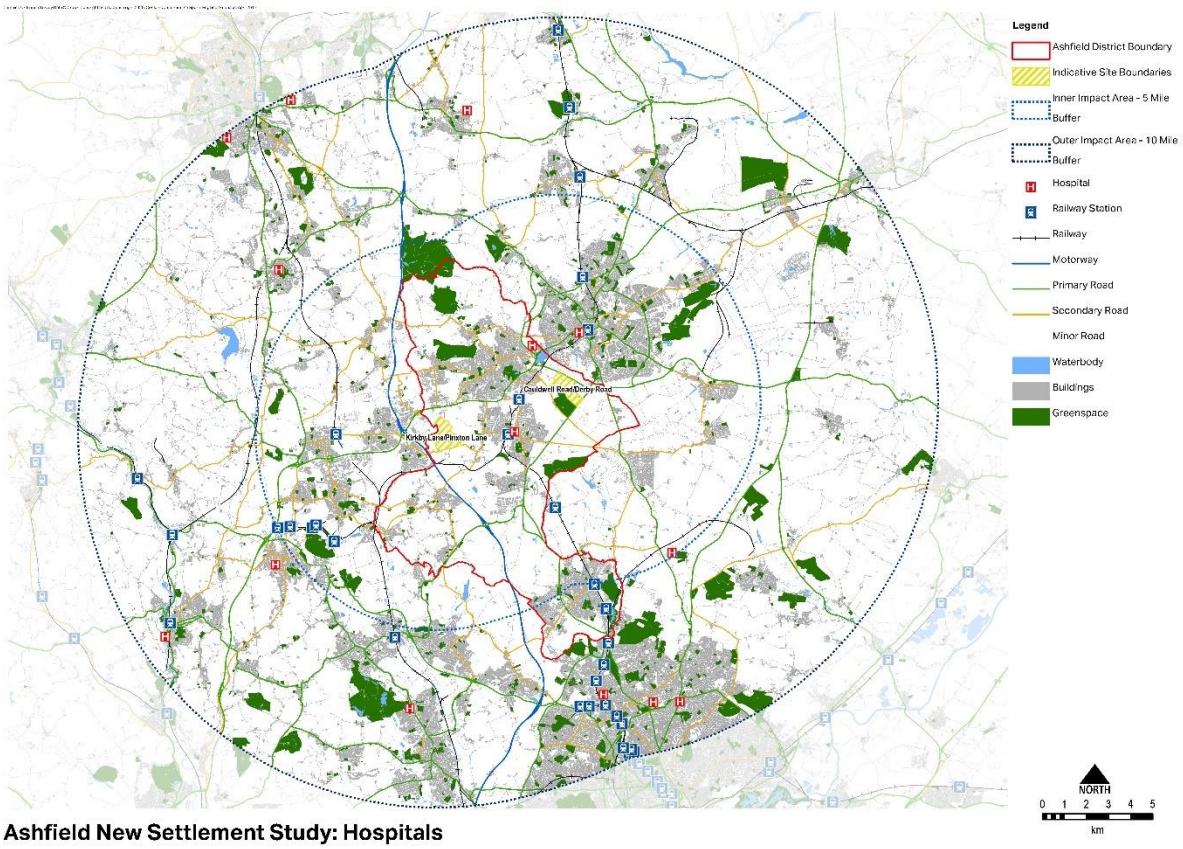
Hospital	Type	NHS Trust
Ashfield Community Hospital	Public	Sherwood Forest NHS Foundation Trust
Babington Hospital	Public	Derbyshire Community Health Services NHS Foundation Trust
BMI The Park Hospital	Private	-
Chesterfield Royal Hospital	Public	Chesterfield Royal Hospital NHS Foundation Trust
Nottingham City Hospital	Public	Nottingham University Hospitals NHS Trust
Clay Cross Hospital	Public	Derbyshire Community Health Services NHS Foundation Trust
Highbury Hospital	Public	Nottinghamshire Healthcare NHS Foundation Trust
Ilkeston Community Hospital	Public	Derbyshire Community Health Services NHS Foundation Trust
King's Mill Centre (Hospital)/King's Mill Hospital	Public	Sherwood Forest NHS Foundation Trust

Mansfield Community Hospital	Public	Sherwood Forest NHS Foundation Trust
Nottingham Woodthorpe Hospital	Private	-
Ripley Hospital	Public	Derbyshire Community Health Services NHS Foundation Trust
Walton Hospital	Public	Derbyshire Community Health Services NHS Foundation Trust

Source – AECOM Research, 2020

Table 11.5: Overnight and bed occupancy per NHS Trust

NHS Hospital Trust	General Acute Beds	Maternity Beds	Mental Illness & Learning Disability	Total Beds	% of General Acute Occupied	% of Maternity Occupied	% of Mental Illness & Learning Disability Occupied	% of all Beds Occupied
Nottinghamshire Healthcare NHS Foundation Trust	102	-	905	**1,007**	82.9%	-	88.2%	**87.6%**
Sherwood Hospitals NHS Foundation Trust	611	48	-	**659**	83.3%	56.4%	-	**81.4%**



Ashfield New Settlement Study: Hospitals

Figure 11.5: Baseline Provision and accessibility to Hospitals

- Within England, NHS Healthcare Trusts provide acute care services. As part of this analysis, existing hospital bed capacity is presented by NHS Trust rather than by Local Authority due to limitations in the available data.
- **Table 11.5** presents the acute healthcare provision near to the site in terms of number of hospital beds and the proportion of that capacity that is occupied (based on average overnight use).

- Occupancy data underpins a relatively significant capacity of spare beds albeit Sherwood Hospitals NHS Foundation Trust has significantly more overall capacity than Nottinghamshire Healthcare NHS Foundation Trust, particularly of general acute hospital beds.
- Nottinghamshire Healthcare NHS Foundation Trust has a high occupancy rate of its mental illness and learning disability provision which suggests less existing capacity to support additional demand.
- There is a low existing provision of maternity beds despite occupancy percentages indicating spare capacity.
- Sherwood Hospitals NHS Foundation Trust and Nottinghamshire Healthcare NHS Foundation Trust provide acute healthcare at several hospitals in Ashfield District and Nottinghamshire County and therefore would serve several growth locations and sub-areas. With an overall occupancy rate of all beds at 81.4% and 87.6% respectively it is likely that additional demand can be supported by existing provision. However, additional provision in particular sectors such as maternity care will need to be considered.

11.2.6 Social care

The following key findings can be seen from the baseline data available:

- There are 46 residential care homes providing care bed spaces within a 5 mile impact area
- It would be likely that an onsite bespoke solution be explored to cater for additional elderly care needs from the development.

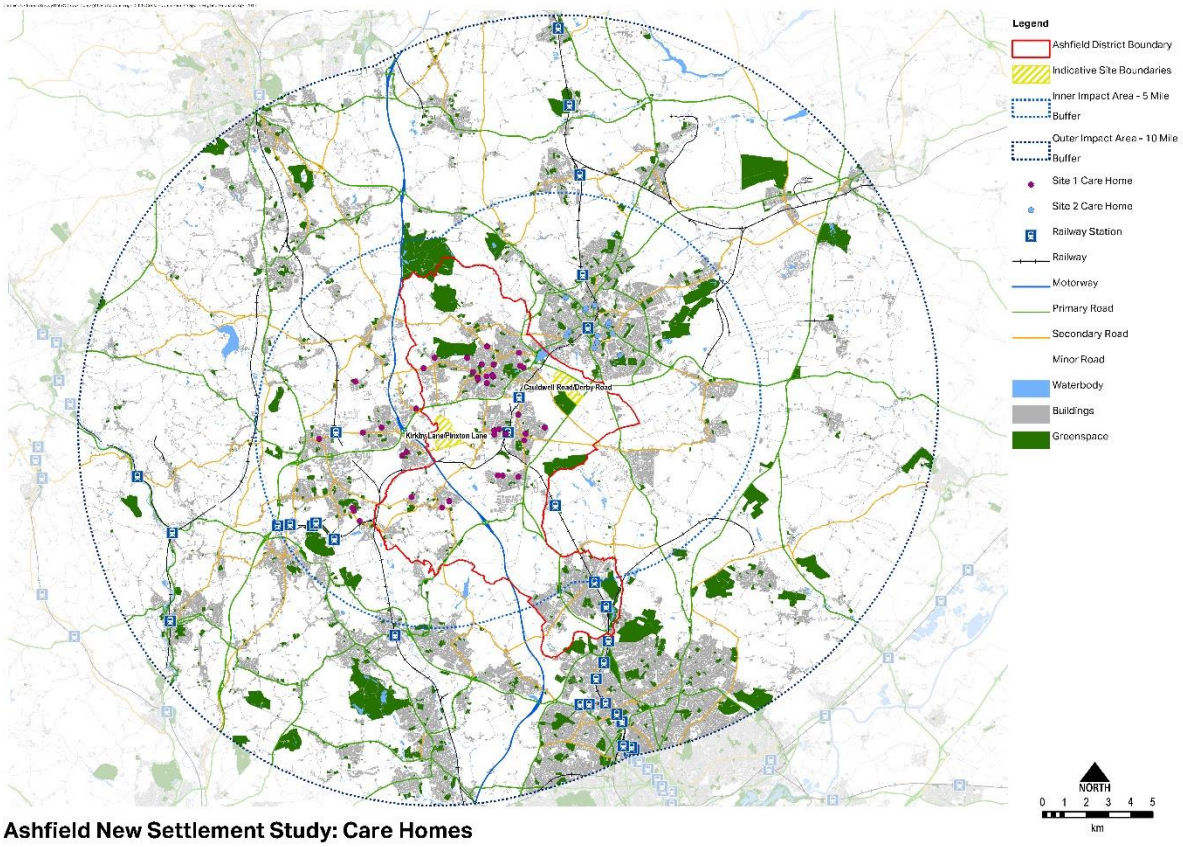


Figure 11.6: Baseline Provision and accessibility to Care Homes

11.2.7 Community facilities

The following key findings can be seen from the baseline data available:

- There are eight community facilities and nine libraries within the impact area of the Site.
- The closest library facilities are located in Sutton in Ashfield.
- The closest community facility to the Site is located in Kirkby-in-Ashfield.

- Given the close catchment standards for community and library facilities it would be expected that some form of multipurpose community facility including the ability to host library services be located on the development Site.

Table 11.6: Baseline Provision of Community Facilities

	Community Centres / Halls	Libraries
Total	8	9

Source – AECOM Research, June 2020

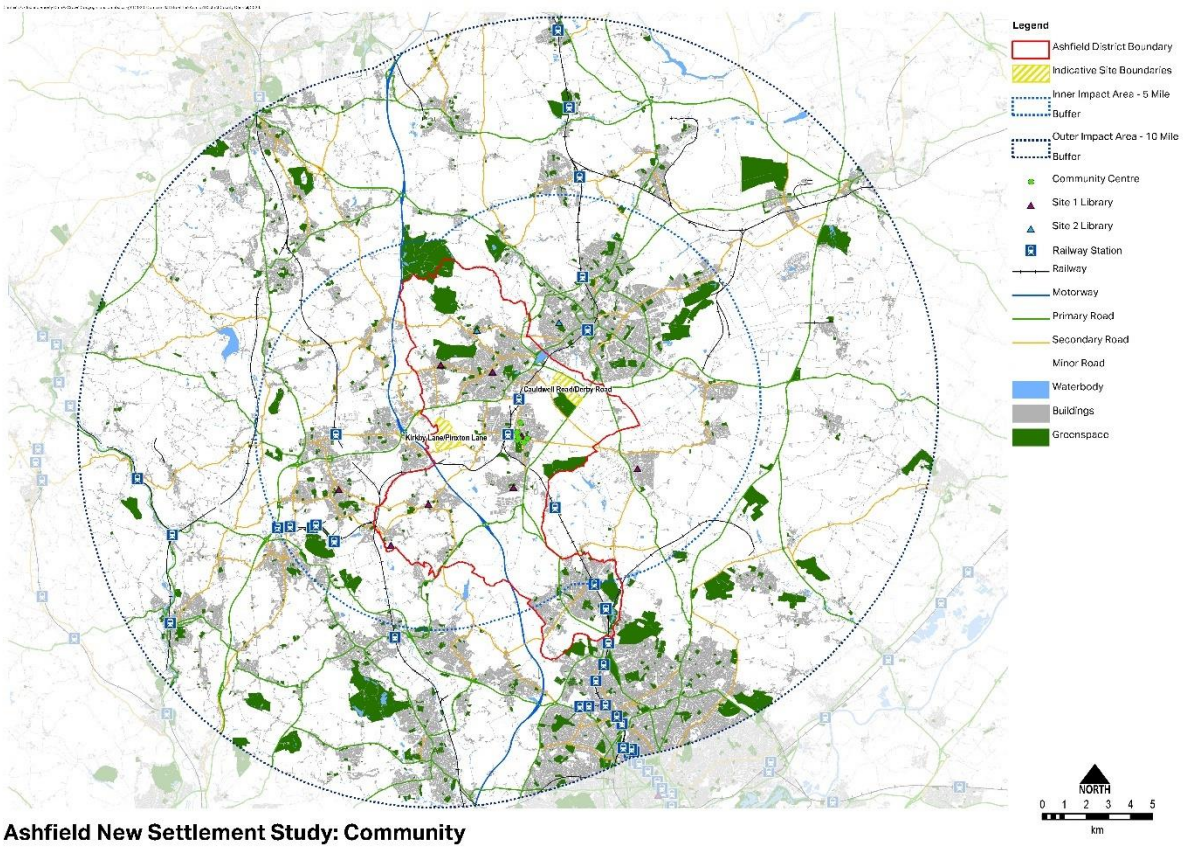


Figure 11.7: Baseline Provision and accessibility to community facilities

11.2.8 Indoor sport

The following key findings can be seen from the baseline data available:

- There are 17 sport halls within the impact area of the Site.
- There are 9 swimming pool facilities within the impact area of the Site.
- Across the wider outer impact area there are 9 studios.

Table 11.7: Baseline Provision of Indoor Sports

	Swimming Pools	Studios	Sports Halls
Total	5	9	17

Source – Sport England Active Places Data 2019

11.2.9 Outdoor sport

The following key findings can be seen from the baseline data available:

- There are 49 outdoor grass pitches within the inner impact area of the Site.
- There are 10 artificial pitches and MUGAs provision within the inner impact area.

- Across the impact area there are 3 outdoor tennis courts.

Table 11.8: Baseline Provision of Indoor Sports

	Outdoor Grass Pitches	Artificial Pitches/MUGA	Tennis Courts
Inner Impact Area (5 miles)	49	10	3

Source – Sport England Active Places Data 2019

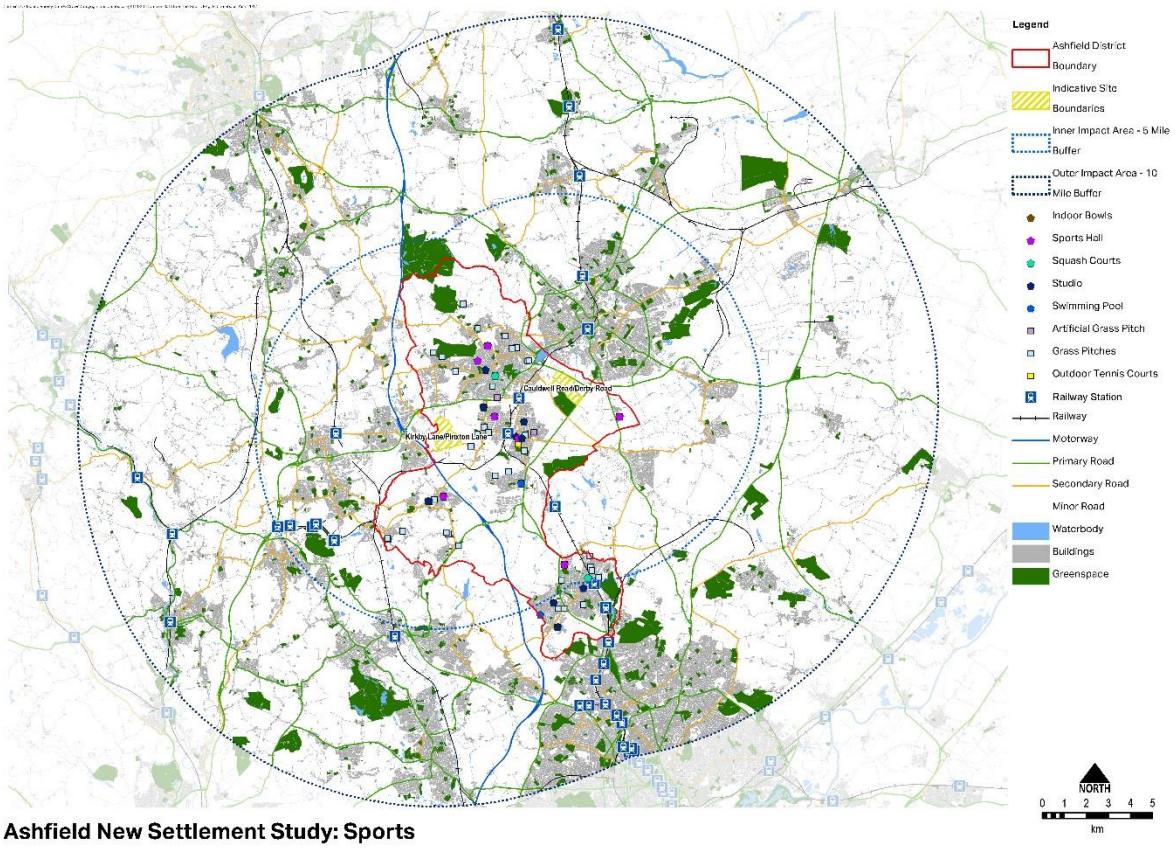


Figure 11.8: Baseline Provision and accessibility to Indoor and Outdoor Sport facilities

11.3 Community infrastructure modelling assumptions

In order to assess the potential infrastructure demand from the various masterplan options a set of modelling assumptions are required. For each infrastructure topic an assumption and associated planning metric has been identified. Where a local planning standard exists, this has been utilised. Where no local standard is apparent a compatible standard has been used.

These assumptions are set out in the table below with the associated source document or reference.

Table 11.9: Proposed Social Infrastructure Modelling Assumptions

Topic	Assumption	Metric	Reference
Early Year Facilities	0-1 year olds in formal Provision	9%	AECOM benchmark Standard based upon guidance from wider UK Councils
	1 year olds in formal Provision	18%	
	2 year olds in formal Provision	40%	
	3 year olds in formal Provision	77%	
	4 year olds in formal Provision	60%	
	Sq.m per 50 place nursery	150	

Primary Schools	Places per dwelling	0.21	Nottinghamshire CYPS 2019-2021
	% of yield to private schools	5%	AECOM benchmark Standard based upon guidance from wider UK Councils
	Primary School Pupils in 1 Form Entry	210	Department for Education
Secondary Schools	Places per dwelling	0.16	Nottinghamshire CYPS 2019-2021
	% of yield to private schools	5%	AECOM benchmark Standard based upon guidance from wider UK Councils
	Secondary School Pupils in 1 Form Entry	150	Department for Education
GP Surgeries	People per GP	1,800	Planning Benchmark Standard
	Sq.m per GP	165	NHS Healthy Urban Development Model
Dental Practices	People per Dentist	1,760	Existing ratio of Dentists to population across England 2015 (based on General Dental Council 2015 Data)
	Sq.m per Dentist	50	AECOM Standard from Comparable UK Infrastructure projects
Hospitals	People per Bed	510	Existing ratio of Hospital Beds to population across England 2015 (based on NHS England Data)
	Sq.m per Bed	160	AECOM Cost Consultant Benchmark data
Social Care - Nursing Homes	Beds per 1000 persons over 75	45	The Housing Learning and Improvement Network (LIN) SHOP TOOL - Demand levels based prevalence rates from "More Choice, Greater Voice".
	Bed Per Facilities	72	AECOM benchmark Standard based upon guidance from wider UK Councils
	Sq.m Per Bed	56	
Social Care - Residential Care Home	Beds per 1000 persons over 75	65	The Housing Learning and Improvement Network (LIN) SHOP TOOL - Demand levels based prevalence rates from "More Choice, Greater Voice".
	Bed Per Facilities	72	AECOM benchmark Standard based upon guidance from wider UK Councils
	Sq.m Per Bed	56	
Community Space	sq.m per 1,000 person	70	
Library Space	sq.m per 1,000 person	30	Arts Council (Previously Museums, Libraries and Archives Council (MLA))
Swimming Pools	People per pool lane	5,000	Sport England – Active Places – UK Average 2019
Sport Halls	People per sqm of sports hall	82.8	

Furthermore, an assumed tenure mix of 80% market housing and 20% affordable housing (broken down to 16% social rented and 4% intermediate) has been applied to the social infrastructure modelling. A housing mix breakdown highlighted below has been applied taking into account the tenure split. This is derived from the Nottingham Outer Strategic Housing Market Assessment (2015).

Table 11.10: Housing Mix (Nottingham Outer Strategic Housing Market Assessment 2015)

Housing Mix	1 Bed	2 Bed	3 bed	4 Bed+	Total
Market	5.0%	35.0%	50.0%	10.0%	**100.0%**
Affordable - Social Rented	35.0%	35.0%	25.0%	5.0%	**100.0%**
Affordable - Intermediate	35.0%	35.0%	25.0%	5.0%	**100.0%**

11.4 Mitigation requirements

The table below sets out the results of community infrastructure requirements associated with development of 1,611 units at the Site and the application of the infrastructure modelling assumptions set out earlier. This section reviews these outputs in more detail taking into account associated recommendations for mitigation of increased demand on infrastructure provision.

Table 11.11: Community Infrastructure Assessment Results

	Based upon Assumed Housing Delivery of 1,611 units
Affordable Housing % Scenario	20%
Total Population	***3,875***
Early Years Places (FTE)	72
Early Year Facilities (50 Place Nurseries)	1.4
Primary School Children (Pupils)	338
Primary School Form Entries	1.6
Secondary School Children (Pupils)	258
Secondary School Form Entries	1.7
General Practitioners (GP's)	2
Primary Care Centre Floorspace (sq.m)	327
Dental Surgeons	2
Dental Surgery Floorspace (sqm)	101
Hospital Beds	9
Hospital Space (sqm)	1,440
Nursing Home Beds	15
Residential Care Beds	21
Community Space (sqm)	250
Library Space (sqm)	107
Sports Halls (sqm)	0.2
Swimming Pools (sqm)	0.2
Outdoor sports (ha)	4.3

11.5 Mitigation strategy recommendations

The following recommendations are based upon the worst case scenario in terms of demand. It is also important to also consider the timing of provision, not all recommendations will be delivered at once but rather phased with development and therefore the baseline of existing social infrastructure provision is key to allow for phasing in of additional homes where there is some existing capacity in infrastructure.

11.5.1 Early Years

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities, the requirement should be mitigated on Site.
- Nursery provision to cater for a maximum of 80 children (Full time equivalent) from the 'Optimum Capacity'.

- Assuming typical nursery settings of 50 places this equates to two settings.
- Potential for one or two settings to be provided within an on-site primary school. Potential for further setting to be located within community hub facilities.

11.5.2 Primary Education

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities, the requirement should be mitigated on site.
- Primary school provision to cater for a maximum of 338-368[33] children aged 4-11 years.
- Assuming typical primary school form entry (FE) size of 210 places (7 years of 30 places) this equates to almost two forms of entry.
- The Nottinghamshire Pupil Places Planning and School Capacity Plan states that new primary schools should endeavour to create two forms of entry and therefore it is recommended that a single 2FE primary school is provided on-site.
- A bespoke approach for the Site is required and will need to be developed in partnership with the education authority to understand approach towards initial years of development and potential for use of existing infrastructure capacity.

11.5.3 Secondary Education

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement can be provided for off-site through use of existing facilities within a reasonable area of influence.
- Secondary school provision to cater for a maximum of 258-280[34] children aged 11-15 years (from the 'Optimum Capacity').
- Assuming typical secondary school form entry size of 150 places (5 years of 30 places) this equates to almost 2 form entries of provision.
- The Nottinghamshire Pupil Places Planning and School Capacity Plan states that new secondary schools should endeavour to create seven forms of entry (or 1,050 places) wherever possible.
- Therefore, taking into account the approach set out by Nottinghamshire County Council and the sufficient surplus provision in existing secondary schools, it is recommended that additional demand is met through existing capacity.
- A bespoke approach for the Site is required and will need to be developed in partnership with the education authority to understand approach towards potential use of existing capacity within the area of influence.

11.5.4 Primary Healthcare

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement can be provided for on-site or off-site through use of existing facilities within the area of influence.
- Primary healthcare provision to cater for a maximum potential patient list size of 3,875people.
- Assuming typical benchmark standards this equates to a need for 2 additional GPs and 2 additional dentists which would require a facility scaled to approximately 465 sq.m
- It is recommended that any on site solution is delivered as a single facility built with the ability to expand according to demand.

[33] Based upon a development of 1,611 – 1,750 dwellings
[34] Ibid

- A bespoke approach for the Site is required and will need to be developed in partnership with the Clinical Commissioning Group (CCG) to understand approach towards potential use of existing capacity within the area of influence and whether an onsite healthcare facility is preferred and viable.

11.5.5 Hospitals

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement will be provided for off-site through use of existing facilities within the area of influence.
- Hospital provision to cater for a maximum potential patient list size of 3,875 people equates to approximately 9 additional hospital beds.
- A bespoke approach for the Site is required and will need to be developed in partnership with the Clinical Commissioning Group (CCG) to understand approach towards potential use of existing hospital capacity within the area of influence.

11.5.6 Social Care

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement can be provided for on-site or off-site through use of existing facilities within the area of influence.
- Nursing and care bed requirements equivalent to a maximum of 39 bed spaces.
- There is a range of facilities in the area of influence that could potentially cater for this demand although the assessment of demand is based upon the likely on site population over the age of 75 and could therefore be assumed as an onsite requirement.
- On site provision could take the form of Extra Care housing to the scale of 40 units which would need to form part of the proposed housing mix for delivery, potentially as part of the affordable housing provision.

11.5.7 Community Facilities

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement can be provided for on-site or off-site through use of existing facilities within the area of influence.
- Requirements equivalent to a maximum of 271 sq.m of community space and 116 sq.m of library space.
- This provision could be delivered on site through a community hub facility delivering a range of services including shared community space, library services and other services including community policing touch down points, indoor sport halls, art and cultural spaces.

11.5.8 Indoor Sport

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement can be provided for off-site through use of existing facilities within the area of influence.
- Requirements equivalent to 0.3 sport halls and 0.2 of swimming pools generated by development at the site.
- The level of demand for swimming pools would not justify the delivery of a swimming pool on site, so use of existing facilities in the area of influence is recommended with potential contributions from the development to those existing sites.
- The level of demand for sports halls would not justify the delivery of an on-site sports hall, however development could potentially to include a sport hall within a shared multi-purpose community facility. There

is also the potential to utilise any onsite primary school sport hall out of hours through the use of a community access agreement.

11.5.9 Outdoor Sport

Our assessment of demand taking into account the existing provision of social infrastructure suggests the following:

- Based on the location of the Site and catchment recommendations for these facilities the requirement can be provided for on site or off-site through use of existing facilities within the area of influence.
- Requirements equivalent to 4.7 hectares of outdoor sports space.
- The level of demand for outdoor sports could justify the delivery of an on-site facility, potentially within a shared multi-purpose community facility or a dedicated standalone facility. There is the potential to utilise any onsite primary school sport facilities out of hours through the use of a community access agreement. There is also the potential to utilise existing provision of off-site facilities.

11.6 Risks

The detailed assessment of existing social infrastructure and appropriate mitigation requirements set out above highlights a number of key risks regarding social infrastructure delivery at the Site. These risks are primarily focussed around education and healthcare provision, and as anchor infrastructure for potential development, these risks could have far reaching impacts to viability and other facets of development.

Firstly, as highlighted by the baseline analysis, the immediate impact area around the Site is constrained significantly in terms of spare primary education capacity. It was therefore recommended that, given the small catchment of primary schools, to mitigate additional demand generated by development an on-site facility is provided. As such an underlying risk will be securing the delivery/funding of the new facility, whether delivered as a free school, by the education authority with a contribution from the developer or direct delivery by the developer. There are potential programme risks if clear delivery routes are not secured early on in the planning process.

Similarly, if on-site primary healthcare provision was the preferred route for development then programme risks relating to securing delivery/funding apply. The additional demand generated by development is not as significant as primary education and there is greater flexibility in existing provision to service additional demand. However, identifying a clear preferred option for on-site/off-site provision and funding mechanisms with the CCG early in the planning process will reduce risk of delivery difficulties.

11.7 Proposed mitigation solution

The risks presented above can be mitigated through a comprehensive Section 106 Agreement and negotiation process. This however will require early engagement and working with both the local education authority regarding education provision and the CCG regarding healthcare provision. Engaging relevant authorities early in the planning process, potentially at masterplan inception stage, will ensure that a clear preferred route can be identified and built into any proposals as appropriate and flexibly. If a common working ground is agreed this will also ensure that Section 106 agreement negotiations are efficient and suitable agreements/contributions can be written into the legal agreement.

Having this clarity and security around funding and delivery will be fundamental to ensuring that vital pieces of core social infrastructure are delivered as part of a new community, mitigating any potential adverse impacts on the existing community.

11.8 Estimated abnormal costs for proposed mitigation solution

Beyond normal costs for the site relating to social infrastructure include:

- On-site provision costs;
  - Two 50-place nurseries
  - 2FE Primary School
- Off-site Contribution costs

  - 2FE Secondary School provision
  - Acute healthcare provision
  - Indoor sports provision
  - Outdoor sports provision

- To be confirmed on-site/off-site:
  - 2GP Primary Healthcare Facility
  - 40 unit extra care accommodation
  - 400 sqm multi use community facility
  - 4.7ha outdoor sports

On site abnormal costs include a 2FE primary school (nursey costs also included in this calculation) at £8,190,000, a primary care centre and dental centre at £856,000 and a community facility/ library at £535,500.

In addition, there are a number of off-site costs, a 2FE secondary school contributions at £4,580,274, acute healthcare contributions at £3,348,000, indoor sports contributions at £628,000 and outdoor sports contributions at £3,000,000.

This results in a total cost of £25,685,781 for social infrastructure including profession fees (£1,197,688) and design development and construction contingency (£3,350,319).

12. Light impact assessment

12.1 Existing reports / information referred to

- Institute of Lighting Professionals guidance note ILP GN01
- Google Earth and Streetview

12.2 Detailed overview

Local areas will have a typical lighting character comprised of the nature of development which influences the type of lighting in use, and how it is used. This is primarily related to population density and frequency of lighting installations, particularly those with traffic route lighting or high power installations.

The lighting environmental zone is looks at criteria provided by the Institute of Lighting Professionals within their guidance note ILP GN01. There are five zones which range from dark through to high brightness which have corresponding limiting recommendations for new lighting to have a minimally obtrusive effect. The limiting criteria grows stricter the darker the environment.

Defining environmental zones can be aided by describing a location in terms of population density and traffic routes. This looks more at the overarching character of the wider area which may also influence an individual site. **Table 12.1** provides an overview of how the environmental zones are considered. The guidance does advise that when considering brightness characteristics and their limitations, the stricter criteria should be used.

Table 12.1: Environmental Zones (extract ILP GN01)

Zone	Surrounding	Lighting Environment	Examples	Equivalence Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks.	Few people, few paved roads, infrequent use of exterior lighting to promote dark skies with minimised sky glow.
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc.	No road lighting and low population density.
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations.	Road lighting lit to residential standards and relatively low population density.
E3	Suburban	Medium district brightness	Small town centres or suburban locations.	Roads lit to traffic route standards with a moderate population density.
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity.	Areas of high activity after dark, such as shopping centres or urban areas with a high concentration of restaurants and clubs.

Site 1 is in a relatively open area which sits between larger, more densely populated areas including Pinxton and to the west, commercial / industrial buildings to the north, Sutton in Ashfield/Kirkby-in-Ashfield to the west and further commercial / industrial and residential development to the south toward the Sherwood Business Park. The M1 is between Pinxton at its east boundary and Site 1.

The current area around Kirkby Lane and Pinxton Lane is sparsely developed, comprising of mostly agricultural land, it has few roads and infrequent buildings, with most properties having residential or commercial uses.

A variety of lighting is observed in the wider area associated with commercial / industrial parks, statutory road and motorway installations, and residential development.

There is no road lighting observed along Kirkby Lane or Pinxton Lane, and any lighting found within the local area is expected to be associated with security and perimeter lighting for businesses and lighting used for security or personalisation for residential properties.

12.2.1 Receptors

Currently, the closest receptors are expected to be residential properties or ecological species which might utilise the local area for commuting / foraging / breeding purposes.

12.2.2 Lighting character

Site 1 has a more natural aspect within a suburban / urban setting. This typically describes a location that is consistent with a lighting environmental zone E1.

Smaller towns are expected to have characteristics consistent with environmental zones E2/ E3, where major towns and cities may trend toward the E3 / E4 range in terms of brightness.

Industrial development tends to have a higher lighting requirement and be more consistent with a lighting environmental zone E3.

12.2.3 Constraints and opportunities

New development is expected to require new lighting for safe use and access. This lighting will be introduced in a location that itself contains little lighting, although some degree of lighting of the surrounding area will be evident depending on the direction of view. Although not as bright as the surrounding area, it is not likely to be intrinsically dark.

Key receptors which could be affected by new lighting associated with Site 1 are expected to consist of:

- Local residential amenity;
- Ecology, where present; and
- Retention of night-time amenity.

While this does give some flexibility for what type of development could be considered suitable for the site, it is recommended to limit large increases in local brightness to maintain the exterior amenity as much as possible.

Ecological assessment has the potential to find bats or other light sensitive species in the area which could introduce limitations for new lighting. Ecological receptors should be confirmed through ecological survey to inform future development.

It is not anticipated that special constraints apply to Site 1 beyond incorporating good practice measures and thoughtful design into strategies for new lighting to control obtrusive effects such as light spill, sky glow and glare. It is likely that development of Site 1 will be consistent with a new lighting character of zone E2 up to a possible E3, however effort should be made to limit obtrusive effects further

12.3 Risks

Ecological assessment has the potential to find bats or other light sensitive species in the area which could introduce limitations for new lighting. Ecological receptors should be confirmed through ecological survey to inform future development.

12.4 Proposed mitigation solution

It is not anticipated that special constraints apply to Site 1 beyond incorporating good practice measures and thoughtful design into strategies for new lighting to control obtrusive effects such as light spill, sky glow and glare. It is likely that development of Site 1 will be consistent with a new lighting character of zone E2 up to a possible E3, however effort should be made to limit obtrusive effects further

12.5 Estimated abnormal costs for proposed mitigation

None identified

13. Site capacity

The initial estimated capacity for the site was identified by Ashfield District Council officers as 1,750 dwellings (subject to further testing through this study). As a result of further assessment work, it has been possible to refine this estimate, taking into account identified constraints and opportunities from the previous chapters.

Figure 13.1 overleaf identifies spatially the constraints that affect the site and limit the amount of developable land. The gross developable area has been estimated using GIS software and then subject to further refinement to identify an indicative development capacity for the site, as outlined in **Table 13.1**. The calculation for both sites has applied a gross-to-net ratio of 60% (i.e. 60% is developable for residential use), and then a 35 dwelling per hectare multiplier on the net developable area to calculate overall capacity.

The constraints that have been taken into account in arriving at the developable area and site capacity for Site 2 are as follows:

- The presence of adjacent Ancient Woodland and designations of Nature Conservation Areas and Mature Landscape Areas in the Adopted Local Plan.
- Unsuitable Landscape Areas are identified by AECOM landscape specialists by virtue of harm to landscape character, a lack of containment and creating perceptions of sprawl. A landscape buffer is recommended in the far south-eastern corner and it would be desirable to retain the green corridor associated with The Dumbles within any new development.
- The presence of a below intermediate pressure ground gas main that reduces development capacity and overhead powerlines, that would need to be diverted or avoided.
- Avoiding harm to the setting of the locally listed Stonehills Farm. The design of any proposed development on the site should take into consideration the rural setting of Stonehills Farm and aim to preserve the farmstead, retain some of the rural setting of the farmstead and provide some screening through landscaping and planting.
- Land-take associated with the HS2 safeguarding area (affecting land at the south western corner of the site, south west of Parcel 1a).

Table 13.1: Site 1 developable area and capacity schedule

Site / parcel	Site Size (ha)	Net Developable Area (60% gross-to-net)	Dwellings (35 dph)
1a	36.33	21.798	763
1b	8.62	5.172	181
1c	13.59	8.154	285
1d	2.95	1.77	62
1e	5.33	3.198	112
1f	1.77	1.062	37
1g	8.13	4.878	171
Site 1 total	**76.72**	**46.032**	**1611**

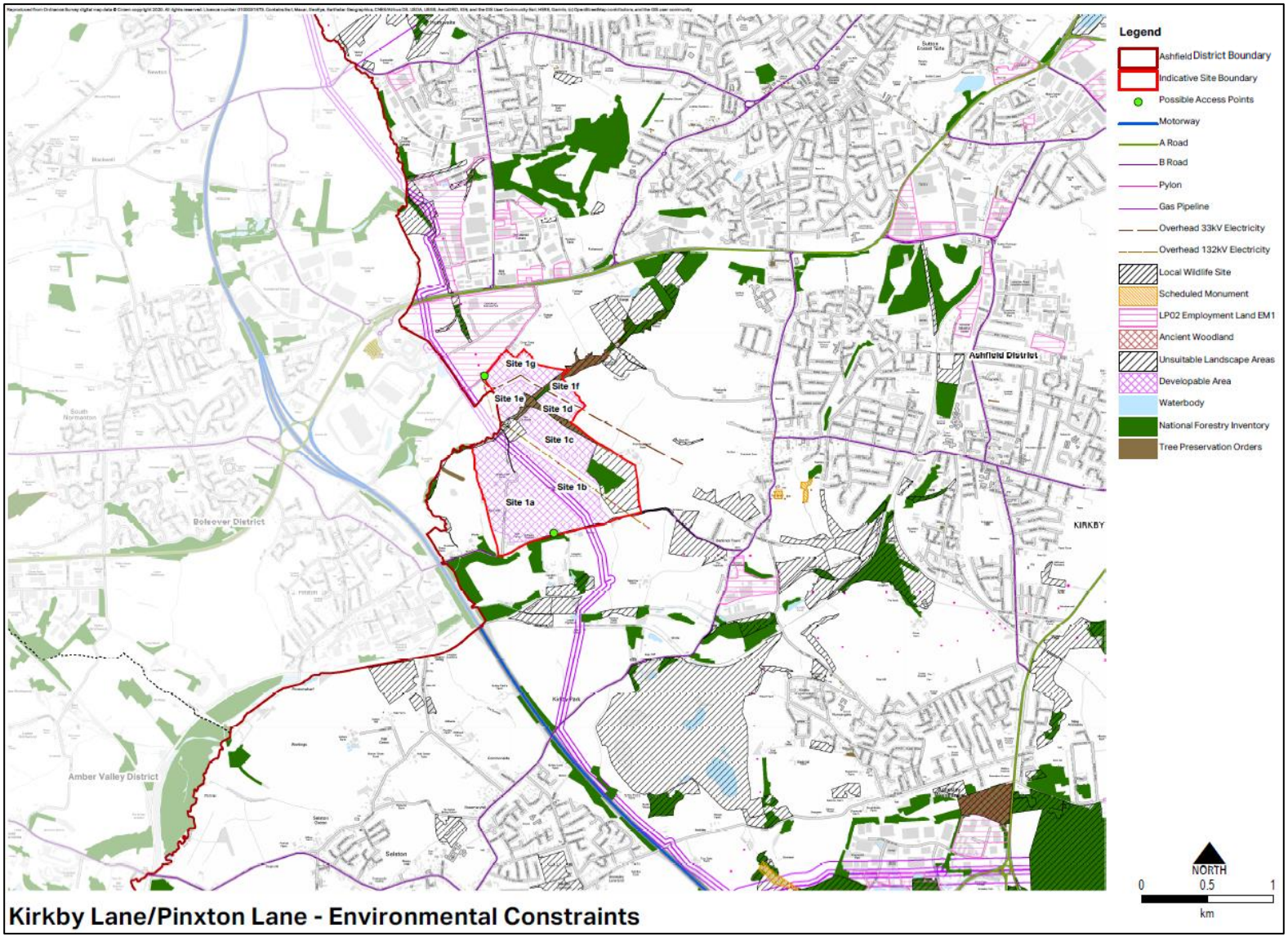


Figure 13.1: Site 1 Constraints and developable area map

14. Delivery and Implementation

Based on the preceding capacity assessment there is approximately 46 hectares net developable area (the revenue-earning proportion of the site i.e. land developed for housing or commercial buildings). This is based upon a gross site area of approximately 76 hectares. The viability modelling builds in a 60:40 net to gross ratio, meaning at least 40% of the site would be required for formal and informal open space, sustainable urban drainage systems, community facilities and strategic on site infrastructure etc. Applying a density of between 35 to 40 dwellings per hectare would generate approximately 1,600 new dwellings (see **Table 14.1**).

Table 14.1 Site 1 capacity assumptions

		Gross	Net	Units
Site 1	Kirkby/ Pinxton Ln	76.72	46.03	1,611

14.1 Land ownership constraints

The PPG[35] requires all sites to be assessed for their availability. This should consider whether there are legal or ownership impediments to development e.g. unresolved multiple ownerships, ransom strips tenancies or operational requirements of landowners, which may affect the availability of the site. There are no ransom strips affecting site 1. However, access from the north would be more challenging without northern parcels being made available for development.

Figure 14.1 (overleaf) shows the landownership boundaries alongside the sites submitted to Ashfield District Council through the preparation of the Strategic Housing and Economic Land Availability Assessment. Site 1 includes multiple landowners (individuals and companies) which may make site assembly more challenging.

Table 14.2 (Site 1 land ownership schedule) summarises the main information held in the Land Registry title deeds for each parcel of land. This reveals that a number of the sites include rights over neighbouring land and/or restrictive covenants. These factors would need to be explored in consultation with the landowners should the land be taken forward as a housing allocation and is required for the delivery of strategic infrastructure (such as access or on-site reinforcements).

This highlights that the availability of the northern parcels of land are currently unknown. The northern parcels of land are in close proximity to extant employment land allocations and commercial developments. Areas to the north of the site have previously been identified as land potentially required for the construction for HS2[36]. These factors should be kept under review should the site be taken forward as a housing allocation in the Local Plan.

[35] Paragraph: 021 Reference ID: 3-021-20190722 Revision date: 22 07 2019. Accessed at: https://www.gov.uk/guidance/housing-and-economic-land-availability-assessment#method--stage-4-assessment-review
[36] See Hucknall to Selston map (p30). Accessed at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746990/HS2_Phase_2b_WDES_Volume_2_LA08_Pinxton_to_Newton_and_Huthwaite_map_book.pdf

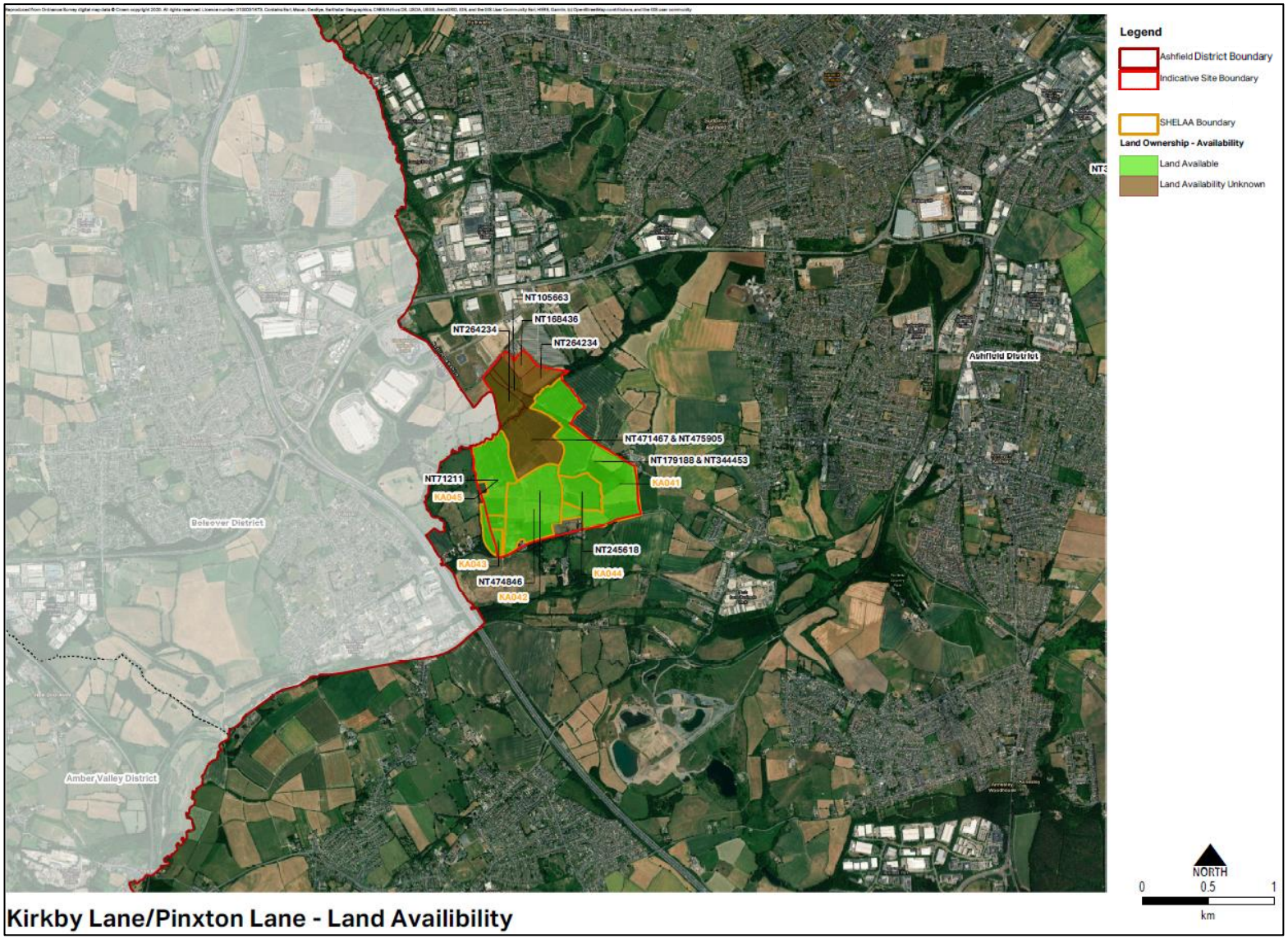


Figure 14.1: Site 1 Land ownership and availability

Table 14.2: Site 1 land ownership schedule

Title No	SHELAA Call for Sites reference	Owner	Price Paid £	Freehold/ Leasehold	Mortgage – Yes/No	Public Rights of Way	Rights over adjoining land e.g. easements	General boundary information issues	Deliverability issues e.g. ransom strips, protective covenants, numerous landowners etc.
NT71211	KA045	Individual(s) A	The value as at 25 November 2016 was stated to be between £200,001 and £500,000	Freehold	No	Yes	No	No	3 owners – no disposition by a sole proprietor of the land in return for capital money except under order of the court.
NT105663	N/A	Individual(s) B	16,500	Freehold	No	No	No - although British Railways Board holds some rights to access the land.	No	2 owners - no disposition by a sole proprietor of the land in return for capital money except under order of the court. British Railway Board have a number of rights on the land.
NT168436	N/A	Individual(s) B	Unknown	Freehold	No	No	Yes, easements to the land adjacent.	No	2 owners - no disposition by a sole proprietor of the land in return for capital money except under order of the court. Covenant states that no noxious or offensive trade should be carried out on the land and no wine, beer or spirits sold. The land is subject to a deed with restrictive covenants (not included on this document)
NT179188	KA041	Individual(s) C	Unknown	Freehold	No	No	No	No	2 restrictive covenants on boundary fencing, restrictions on types of use/ trade that would be allowed (such as fried fish shop, tripe boiler or rag or fat merchant or any noisy noxious or offensive trade, no wine, beer or spirts sold at any time on the land or any building be used as a club. No operations involving the boring, storing, treating, converting or refining petroleum. The land is subject to a deed with restrictive covenants (not included on this document)

Title No	SHELAA Call for Sites reference	Owner	Price Paid £	Freehold/ Leasehold	Mortgage – Yes/No	Public Rights of Way	Rights over adjoining land e.g. easements	General boundary information issues	Deliverability issues e.g. ransom strips, protective covenants, numerous landowners etc.
NT344453	KA041	Individual(s) C	Unknown	Freehold	No	No	No	Boundary map is exactly the same as above (NT179188).	No
NT245618	KA044	Individual(s) D	420,000	Freehold	No	No	Yes, the land has a right of way.		The land is subject to 2 deeds, one of which contains restrictive covenants - (not included on this document)
NT264234	N/A	Individual(s) E	Unknown	Freehold	No	No	No	No	Land used to be in the same ownership as NT168436 and was transferred to the named owner with a requirement that sufficient fencing is maintained to the satisfaction of the transferor. There is a covenant stating that no noxious or offensive trade should be carried out and no wine, beer or spirits should be sold on the land. Some/all of the land is leased to Crow Trees Solar Farm.
NT471467	N/A	Bunting (Agri) Limited	165,000	Freehold	No	No	No	Exactly same boundary as land below (NT475905).	No disposition of the land without certificate signed by Individual F (or their representative/conveyancer) that the provisions of clause 12 of a transfer (2011) made between Individual F and Bunting (Agri) Limited have been complied with.,
NT475905	N/A	Bunting (Agri) Limited	165,000	Freehold	No	No	No	Exactly same boundary as land above (NT471467).	The British Gas Corporation have some rights on the land. No disposition of the land without certificate signed by Individual F (or their representative/conveyancer) that the provisions of clause 12 of a transfer (2011) made between Individual F and Bunting (Agri) Limited have been complied with.,
NT474846	KA042	Individual(s) E	800,000	Freehold	Yes	No	Yes – right of way on the adjoining land for access to the land from the main	No	No disposition of the land without certificate signed by Individual F (or their representative/conveyancer) that the provisions of the first schedule (referred to in the Charges

Title No	SHELAA Call for Sites reference	Owner	Price Paid £	Freehold/ Leasehold	Mortgage – Yes/No	Public Rights of Way	Rights over adjoining land e.g. easements	General boundary information issues	Deliverability issues e.g. ransom strips, protective covenants, numerous landowners etc.
							road at Pinxton Green and the right to use the sewer and drains of the adjoining property.		Register) have been complied with or without written consent signed by the proprietor for the time being of the Charge dated 9 June 2011 in favour of HSBC UK BANK PLC. The British Gas Corporation have some rights on the land.

14.2 Viability assessment

The table of results (overleaf) includes several appraisals for the site that show the residual land value per hectare (Ha) with varied levels of affordable housing (0% to 30%) and developer contributions (£0/unit to £40,000/unit). The residual land value is the (residual) sum of money available for the purchase of land, it is calculated by taking the total value of the completed development minus the total costs of development (including the developer's profit, construction costs, fees, interest etc.)

The Existing Use Value of site 1 is assumed to be £25,000/Ha (agricultural land value)[37]. The EUV 'plus' approach propounded by the PPG requires viability appraisals to build in a return to the landowner that would incentivise them to release their land for development. In this study we have assumed £250,000/ha as the 'plus' above the EUV (benchmark land value or threshold land value). The residual land value must equal or exceed the EUV 'plus' (£275,000/Ha) in order for the site to be considered viable. The EUV 'plus' assumed in the appraisal is low in comparison to the previous Whole Plan & Community Infrastructure Levy Viability Assessment (July 2016) which assumed £790,407 per Ha. New settlements require more upfront strategic infrastructure investment than a typical brownfield strategic or large site and this has been reflected in the assumptions of the appraisal.

The remediation and off-site services are treated as abnormal costs and the transport and social infrastructure costs as s106 costs. On this basis, the abnormal costs are estimated to be within a range of £7,500 - 10,000 per unit on each site (based on AECOM cost management specialist estimates)[38]. A summary of the abnormal costs and s106 assumptions are set out below.[39]

Table 14.3 Abnormal costs and s106 assumptions

Site 1. Kirkby Lane/Pinxton Lane

Abnormal Costs			
	Remediation	£3,231,730	
	Off-site services	£8,579,000	£11,810,730
S106			
	Transport	£11,212,500	
	Social Infrastructure	£25,685,781	£36,898,281
Total			£48,709,011
	£/unit		£30,235

The market survey revealed low house values in the study area compared to the wider region. The average values for new homes in Ashfield range from ~£2,200/m^2 - £2,300/m^2 (see Appendix D). An assumption of £2,300/m^2 is applied in the appraisals. Construction costs have been based on the Building Cost Information Service administered by the Royal Institution of Chartered Surveyors (RICS). The BCIS lower quartile and median costs for housing in Ashfield in July 2020 were used in the appraisals[40]. Dependent on the mix, the approximate costs were £1,266/m^2.

The housing mix has been informed by the 2015 Strategic Housing Market Assessment. The recommended mix has been altered to reduce 1 bed flats in the affordable sector and increase the numbers of larger market units.

[37] See – Appendix D, Viability Appraisal, paragraph 5.8 & Land value estimates for policy appraisal (MHCLG, 2019). Accessed at: https://www.gov.uk/government/publications/land-value-estimates-for-policy-appraisal-2019
[38] All cost and value estimates are based on the best available information at the time the report was written. Where a range is provided this reflects that these inputs are changeable and will be subject to more detailed investigations.
[39] Please note that the summary of mitigation costs set out in this detailed report has informed the viability appraisal assumptions. However, the costs detailed in this report have not been inputted directly into the modelling which was undertaken at a later date and after further engagement with stakeholders, ADC and AECOM masterplanners who provided inputs such as the net developable area that were subject to refinement throughout the preparation of this report.
[40] BCIS costs for flats, terraces, semi and detached are utilised to arrive at an average (see summary sheets in Appendix D).

Policy Requirements, with abnormals, varied developer contributions. BCIS median

	Aff %		EUV	BLV	Residual Value								
		Developer Contribution			£0	£5,000	£10,000	£15,000	£20,000	£25,000	£30,000	£35,000	£40,000
Site 1	0%	Kirkby/ Pinxton Ln	25,000	275,000	27,844	-46,241	-124,408	-207,750	-302,571	-414,286	-526,002	-637,718	-749,434
Site 1	5%	Kirkby/ Pinxton Ln	25,000	275,000	7,149	-68,824	-148,091	-234,248	-337,265	-448,981	-560,697	-672,412	-784,128
Site 1	10%	Kirkby/ Pinxton Ln	25,000	275,000	-14,471	-91,534	-172,807	-262,643	-372,207	-483,923	-595,639	-707,355	-819,071
Site 1	15%	Kirkby/ Pinxton Ln	25,000	275,000	-36,680	-114,756	-198,374	-295,532	-407,247	-518,963	-630,679	-742,395	-854,111
Site 1	20%	Kirkby/ Pinxton Ln	25,000	275,000	-59,510	-138,700	-225,182	-330,630	-442,345	-554,061	-665,777	-777,493	-889,209
Site 1	25%	Kirkby/ Pinxton Ln	25,000	275,000	-82,332	-163,605	-254,667	-365,702	-477,418	-589,134	-700,850	-812,565	-924,281
Site 1	30%	Kirkby/ Pinxton Ln	25,000	275,000	-105,457	-189,388	-288,990	-400,706	-512,421	-624,137	-735,853	-847,569	-959,285

Policy Requirements, no abnormals, varied developer contributions. BCIS median

	Aff %		EUV	BLV	Residual Value								
		Developer Contribution			£0	£5,000	£10,000	£15,000	£20,000	£25,000	£30,000	£35,000	£40,000
Site 1	0%	Kirkby/ Pinxton Ln	25,000	275,000	130,022	61,060	-10,815	-87,686	-168,025	-255,852	-362,198	-473,914	-585,629
Site 1	5%	Kirkby/ Pinxton Ln	25,000	275,000	109,954	40,364	-32,618	-110,294	-193,007	-285,574	-396,892	-508,608	-620,324
Site 1	10%	Kirkby/ Pinxton Ln	25,000	275,000	89,772	19,552	-55,328	-134,114	-219,277	-320,119	-431,834	-543,550	-655,266
Site 1	15%	Kirkby/ Pinxton Ln	25,000	275,000	69,514	-1,540	-78,125	-158,428	-246,881	-355,159	-466,875	-578,590	-690,306
Site 1	20%	Kirkby/ Pinxton Ln	25,000	275,000	48,977	-23,493	-100,955	-183,687	-278,541	-390,257	-501,972	-613,688	-725,404
Site 1	25%	Kirkby/ Pinxton Ln	25,000	275,000	28,062	-46,127	-124,839	-210,318	-313,613	-425,329	-537,045	-648,761	-760,477
Site 1	30%	Kirkby/ Pinxton Ln	25,000	275,000	7,191	-68,901	-149,202	-238,719	-348,617	-460,333	-572,049	-683,764	-795,480

Policy Requirements, with abnormals, varied developer contributions. BCIS lower quartile

	Aff %		EUV	BLV	Residual Value								
		Developer Contribution			£0	£5,000	£10,000	£15,000	£20,000	£25,000	£30,000	£35,000	£40,000
Site 1	0%	Kirkby/ Pinxton Ln	25,000	275,000	268,362	201,381	133,232	64,320	-7,333	-84,069	-164,069	-251,465	-356,994
Site 1	5%	Kirkby/ Pinxton Ln	25,000	275,000	245,646	178,665	109,976	40,387	-32,593	-110,268	-192,979	-285,540	-396,856
Site 1	10%	Kirkby/ Pinxton Ln	25,000	275,000	222,695	155,394	86,482	16,151	-59,035	-137,984	-223,540	-325,452	-437,168
Site 1	15%	Kirkby/ Pinxton Ln	25,000	275,000	199,703	131,857	62,946	-8,665	-85,527	-166,524	-256,214	-365,807	-477,523
Site 1	20%	Kirkby/ Pinxton Ln	25,000	275,000	176,637	108,244	38,750	-34,453	-112,541	-196,355	-294,580	-406,295	-518,011
Site 1	25%	Kirkby/ Pinxton Ln	25,000	275,000	153,603	84,691	14,452	-60,963	-140,326	-227,820	-334,958	-446,673	-558,389

Site 1	30%	Kirkby/ Pinxton Ln	25,000	275,000	130,090	61,178	-10,423	-87,427	-169,464	-263,554	-375,270	-486,986	-598,702

Policy Requirements, no abnormals, varied developer contributions. BCIS lower quartile

	Aff %		EUV	BLV	Residual Value								
		Developer Contribution			£0	£5,000	£10,000	£15,000	£20,000	£25,000	£30,000	£35,000	£40,000
Site 1	0%	Kirkby/ Pinxton Ln	25,000	275,000	365,415	299,593	232,612	165,363	96,451	26,355	-47,864	-126,102	-209,617
Site 1	5%	Kirkby/ Pinxton Ln	25,000	275,000	343,063	276,877	209,896	142,107	73,196	2,339	-74,038	-153,535	-240,244
Site 1	10%	Kirkby/ Pinxton Ln	25,000	275,000	320,476	253,925	186,944	118,613	49,367	-23,084	-100,481	-182,592	-274,113
Site 1	15%	Kirkby/ Pinxton Ln	25,000	275,000	297,852	230,934	163,952	95,076	25,086	-49,321	-127,953	-212,910	-313,719
Site 1	20%	Kirkby/ Pinxton Ln	25,000	275,000	274,849	207,868	140,375	71,464	628	-75,898	-156,281	-245,148	-354,207
Site 1	25%	Kirkby/ Pinxton Ln	25,000	275,000	251,841	184,860	116,822	47,667	-24,867	-102,529	-185,745	-282,869	-394,585
Site 1	30%	Kirkby/ Pinxton Ln	25,000	275,000	228,873	161,892	93,309	23,411	-51,222	-130,267	-216,880	-323,181	-434,897

GARDEN TOWN PRINCIPLES. Policy Requirements, no abnormals, varied developer contributions. BCIS lower quartile

	Aff %		EUV	BLV	Residual Value								
		Developer Contribution			£0	£5,000	£10,000	£15,000	£20,000	£25,000	£30,000	£35,000	£40,000
Site 1	0%	Kirkby/ Pinxton Ln	25,000	275,000	500,969	435,562	370,154	304,061	237,080	169,704	100,792	30,733	-43,038
Site 1	5%	Kirkby/ Pinxton Ln	25,000	275,000	474,908	409,500	344,093	277,559	210,577	142,561	73,649	2,711	-73,591
Site 1	10%	Kirkby/ Pinxton Ln	25,000	275,000	448,522	383,114	317,707	250,729	183,747	115,084	45,615	-27,020	-104,519
Site 1	15%	Kirkby/ Pinxton Ln	25,000	275,000	422,138	356,730	290,880	223,898	156,518	87,606	17,264	-57,799	-136,586
Site 1	20%	Kirkby/ Pinxton Ln	25,000	275,000	395,672	330,265	263,967	196,986	128,956	60,044	-11,860	-88,823	-169,870
Site 1	25%	Kirkby/ Pinxton Ln	25,000	275,000	369,278	303,871	237,126	170,145	101,467	31,700	-42,116	-120,449	-204,713
Site 1	30%	Kirkby/ Pinxton Ln	25,000	275,000	342,924	277,307	210,326	142,931	74,019	3,380	-73,011	-153,189	-241,757