

### 3 Scheme description and land uses assessed

#### 3.1 Development assessed

- 3.1.1 The planning application covers a total of 51.82 hectares of land to the west of Hemel Hempstead and the Site Location is identified on the red line at Figure 2.1. Planning consent ('The Proposed Development') is sought for:

*A hybrid planning application for a mixed use proposed development at West Hemel Hempstead, pursuant to Policy LA3 of the adopted Site Allocations Development Plan Document (2017) to provide for up to 1100 dwellings (with up to 40% affordable housing), comprising full planning proposals for 350 dwellings and outline planning proposals (including means of access) for 750 dwellings.*

*The application proposing the development of up to 1100 new dwellings (including affordable housing), land for up to a seven pitch gypsy and traveller site, together with landscaping, roads, footpaths and cycleways, ecological mitigation, sustainable drainage systems, earthworks, public open space, one Neighbourhood Equipped Area of Play (NEAP), two Locally Equipped Areas of Play (LEAP) and a Community Games Area (CGA).*

*The application further includes a Community Hub comprising :-*

- a) a site for a primary school and associated nursery with playing fields on a site of up to 2.1 hectares (incl. CGA)*
- b) specialist accommodation for the elderly with up to 70 rooms (C2 or C3)*
- c) a convenience store of up to 450 sq m (A1)*
- d) three retail units each of which would be up to 100 sq m (A1, A2, A3, A4 and A5)*
- e) a community facility of up to 175 sq m (D1)*
- f) a medical facility or other use of up to 100 sq m (A1, C3 or D1)*
- g) a children's day nursery of up to 450 sq m (D1)*
- h) a shared car park.*

*The full application details which are submitted comprise :-*

- a new vehicular access to Long Chaulden*
- a new vehicular access extension from The Avenue*
- an emergency access to Chaulden Lane*
- a new vehicular access from Chaulden Lane serving only the land for up to a seven pitch gypsy and traveller site and access to a foul drainage pumping station*
- a foul drainage pumping station to Chaulden Lane and the associated connecting sewer.*
- the creation of the first phase of 350 new dwellings and associated landscaping (including affordable housing); together with associated public open space and associated landscaping, roads, footpaths and cycleways, ecological mitigation, sustainable drainage systems, earthworks, and one associated Local Equipped Area of Play (LEAP).*

- 3.1.2 In summary the EIA has assessed the development and use of:

- up to 1,100 residential dwellings including associated development and engineering works such as highways, cycleways, footways and public open space.
- a 70 room care home (Use Class C2 or C3).

- a primary school and associated playing fields on a site of up to 2.1 hectares, capable of accommodating up to two form entry.
- a community hub to provide up to 450 sq. metres of convenience retail (Use Class A1), 300 sq. metres of other retail uses (Use Class A1, A2, A3, A4 and A5), a community facility building of up to 175 sq.m. (Use Class D1), a medical facility or other use of up to 100 sq.m. (Use Class A1, C3 or D1), a children's day nursery of up to 450 sq m (Use Class D1) plus associated car parking and delivery areas.
- informal open space and landscaping, with additional equipped and non-equipped children's play space.
- areas for the attenuation of surface water run-off.
- new main access junctions with Long Chaulden and The Avenue, and an emergency access from Chaulden Lane.
- new pedestrian links into the Site from Long Chaulden and The Avenue, the incorporation and improvement of existing public rights of way, and the provision of various new pedestrian and cycle leisure routes within the Site and connecting to adjoining public rights of way.
- associated services and infrastructure, including an on-site foul drainage pumping station, an off-site sewer connecting to Berkhamsted Waste Water Treatment Works and off-site highway works.
- a self contained site for seven gypsy and traveller pitches with access from Chaulden Lane.
- the assessment of the potential effects on the highway network, local air quality and from road traffic noise is based on a total of up to 1,100 dwellings, 70 room care home, up to seven gypsy and traveller pitches, a primary school of up to two forms of entry, community hub and the other uses outlined above.

### Relevant Plans

- 3.1.3 The hybrid planning application comprises a number of application drawings for approval together with other supporting information. Of these the overall development concept is expressed by parameter plans which show the distribution and scale of the development assessed across the whole combined application site. In addition there are more detailed planning application drawings submitted for approval for the first phase, which is submitted as a full planning application. The extent of the first phase area is shown by the blue dashed line on Figure 3.2 and the black line on Figure 3.15. Those planning application drawings and other supporting figures most relevant to the ES are presented at the end of this Chapter and are listed below.

#### **Site wide plans defining key aspects of the outline planning application across the whole site:**

- Figure 3.1 - Movement Parameter Plan (PP\_001)
- Figure 3.2 - Land Use Parameter Plan (PP\_002)
- Figure 3.3 - Green Infrastructure Parameter Plan (PP\_003)
- Figure 3.4 - Hydrology Parameter Plan (PP\_004)
- Figure 3.5 – Building Heights Parameter Plan (PP\_005)
- Figure 3.6 – Foul water network overview plan (16-021/1008)

- Figure 3.7 – Surface water network overview plan (16-021/1004)
- Figure 3.8 – Illustrative Masterplan (IM001)
- Figure 3.9 – Illustrative Green Infrastructure (GI002)
- Figure 3.10 – Masterplan – Community Hub Concept (CH001)
- Figure 3.11 - Solution Feature Occurrence Assessment (Update Including Engineering Advice)

**Plans defining key aspect of full planning application for phase 1:**

- Figure 3.12 – Composite Phase 1 Site Layout (P16-0587\_03K-1)
- Figure 3.13 – Phase 1 Building Heights Plan (P16-0587\_16)
- Figure 3.14 - Landscape Masterplan P16-0587\_25 (Sheet 1 and 2)
- Figure 3.15 – Green Infrastructure – Site Entrance (GI003)
- Figure 3.16 – Chaulden Lane Vehicle Access (16-021-010)
- Figure 3.17 - Proposed J1A Long Chaulden Access (16-021-071)
- Figure 3.18 - The Avenue Extension Plan (16-021-149)
- Figure 3.19 – Phase 1 – SW Network Sheet 1 (16-021-1005)
- Figure 3.20 – Phase 1 – SW Network Sheet 2 (16-021-1006)
- Figure 3.21 – Phase 1 – SW Network Sheet 3 (16-021-1007)
- Figure 3.22 – Phase 1 – FW Network Sheet 1 (16-021-1009)
- Figure 3.23 – Phase 1 – FW Network Sheet 2 (16-021-1010)
- Figure 3.24a – Phase 1 – FW Network Sheet 3 (16-021-1011)
- Figure 3.24b – Phase 1 – FW Network Sheet 4 (16-021-1024)
- Figure 3.25 – Phase 1 - Indicative Levels Sheet (116-021-1001)
- Figure 3.26 – Phase 1 - Indicative Levels Sheet 2 (116-021-1002)
- Figure 3.27– Phase 1 - Indicative Levels Sheet 3 (116-021-1003)
- Figure 3.28 – Preliminary Foul Drainage Pumping Compound Location (16-021-056)
- Figure 3.29 - Pumping station details (16-021-159)
- Figure 3.30 - Sub Station (P16-0587\_22)
- Figure 3.31 – Reptile receptor area (RA 001)

**Plans relating to off-site infrastructure:**

- Figure 3.32- Proposed J3 Long Chaulden Northridge Way Improvements (16-021-072)
- Figure 3.33 - Proposed J4&5 Long Chaulden Warners End Rd Improvements (16-021-067)
- Figure 3.34 - Proposed J6 Warners End Rd Leighton Buzzard Rd Improvements (16-021-069)
- Figure 3.35 - Proposed J7 St Johns Rd Fishery Rd Improvements (16-021-073)

- Figure 3.36 – Proposed J8 London Rd Fishery Rd Improvements (16-021-068)
- Figure 3.37 - Off-site sewer – route of proposed rising main to Berkhamsted WWTW (16-021-009)

3.1.4 The EIA parameter plans (Figures 3.1-3.5) together with the detailed plans for approval within the first phase area (key drawings included as Figures 3.12-3.31) are submitted for approval by DBC, they are not 'illustrative'. If planning permission is granted for the proposal it would include a planning condition to ensure that the development takes place in accordance with the plans. The detailed design of those elements for which only outline planning permission is sought will evolve within the specified parameters to the extent that they do not give rise to any significant un-assessed effects. The illustrative masterplans and illustrative green infrastructure strategy (Figures 3.8-3.10 respectively) are provided in the ES solely to assist in understanding how the development proposed could be delivered. The remaining plans either assist in confirming foundation designs (Figure 3.11), set out key aspects of the foul and surface water networks (Figures 3.6-3.7) or provide details of off-site development which forms part of the overall project rather than part of the hybrid planning application (Figures 3.32-3.37).

## 3.2 Full component of the application– first phase of 350 dwellings and other associated elements

3.2.1 A key component of the hybrid planning application submission comprises the full details for approval for the first phase of residential development (and associated infrastructure) which relates to approximately 15.45 hectares of the total application site. As demonstrated on Figure 3.12- 3.31, this part of the proposed development will comprise:

- a new vehicular access to Long Chaulden; a new vehicular access extension from The Avenue; an emergency access to Chaulden Lane; and, a new vehicular access from Chaulden Lane serving only a seven pitch gypsy/traveller site and a foul drainage pumping station.
- a foul drainage pumping station to Chaulden Lane and the associated connecting sewer.
- the creation of the first phase of 350 new dwellings and associated landscaping (including affordable housing); together with associated public open space and associated landscaping, roads, footpaths and cycleways, ecological mitigation, sustainable drainage systems, earthworks, electrical sub-station and one associated Local Equipped Area of Play (LEAP).

### **Layout**

3.2.2 The first phase of development has been designed in accordance with the principles of sustainable development, the illustrative masterplan (Figure 3.8) and the overall parameter plans (Figures 3.1-3.5). A varied mix of dwelling types and tenures are to be provided set within existing landscape features, hedgerows, wildlife habitats and corridors; to deliver a 'walkable neighbourhood' whereby future residents will be able to walk to the nearby local amenities of the community hub and primary school once they are delivered in the subsequent phases of development.

3.2.3 The layout comprises a traditional arrangement of enclosed streets and spaces overlooked by surrounding buildings, providing natural surveillance and security. Private areas for gardens, parking and servicing are located behind this building line, within the core of the block. Small front gardens are provided to the building frontages.

- 3.2.4 Building heights (Figure 3.13) conform with the overall building heights parameter plan (Figure 3.5), ranging up to 3 storeys or a maximum of 15 metres to ridge with the taller buildings focussed around key spaces and streets. Indicative site levels are confirmed in figures 3.25-3.27.
- 3.2.5 Density will vary according to character area and range from 35 – 55 dwellings per hectare, with the highest density adjoining the community hub.
- 3.2.6 Materials have been selected to conform to the Built Form materials matrix in the Design Code and also reflect the local vernacular assisting in creating an identifiable local character.
- 3.2.7 The movement strategy for the first phase of development conforms with the Movement Parameter Plan (Figure 3.1) and is focused on creating a clear pattern of streets with easy accessibility, using varied hierarchies of pedestrian-friendly streets to encourage low traffic speeds whilst maintaining permeability and legibility. A dedicated cycle route would be provided as part of a new green link from Long Chaulden running west towards the southern part of the school site. A bus route would run along the Primary Street from Long Chaulden to a temporary turning area within what would become the Community Square in the subsequent phases. Car parking would be on-curtilage, to the rear of the properties, accessed off streets and shared surface lanes and courtyards. Additional spaces for visitor parking would be on-carriageway. Residents' cycle parking is provided in secure cycle stores, or within private garages. All parking is provided to conform to the latest DBC prescribed standards.
- 3.2.8 A key feature of the first phase of development is the Long Chaulden Gateway which contains two permanently wet attenuation basins in a setting of native scrub and meadows, with a backdrop of existing forest-scale trees adjacent to the site's eastern boundary and within the small copse adjacent to Middle Hill (Figures 3.14 and 3.15). The area would benefit from a large number of native trees planted around the ponds which will be supplied as Extra Heavy Standards to provide immediate impact. Cycle and pedestrian footways would pass through the open spaces, providing connectivity between Long Chaulden and the first phase housing and countryside beyond. New housing would form an informal crescent to the west of the area, occupying an elevated position. Further details are provided in the Design and Access Statement.
- 3.2.9 Within the first phase there are a number of opportunities for informal play through the landscape, open space and the sustainable drainage (Figures 3.3 and 3.14). A Local Equipped Area of Play (LEAP) is also provided on the northern edge accessible from the proposed primary road route.
- 3.2.10 An ecological mitigation area, comprising a reptile receptor area (Figure 3.31) is provided on the central western part of the Site (see Chapter 7).

### **Drainage**

- 3.2.11 The overall development will contain two principal drainage networks, consisting of separate foul water and surface water systems, with the surface water from the majority of the site being infiltrated into the ground through a Sustainable Drainage System (SuDS) combining attenuation and infiltration basins, conveyance swales, deep-bore soakaways and porous/permeable paving that will manage the rate of discharge either to ground via deep bored soakaways/shallow infiltration basins or to the local surface water sewer under a controlled manner. These networks are shown in overview in Figure 3.4 Hydrology Parameter Plan, Figure

3.6 Foul water network overview plan and Figure 3.7 Surface water network overview plan; and for the first phase are also shown in more detail in Figure 3.12 Composite Phase 1 Site Layout and Figures 3.19-3.24b).

- 3.2.12 The first phase of the application also includes an electrical substation (fig 3.30) and, located in the south west corner of the site, an on-site foul water pumping station with the connecting sewer (Figure 3.28-3.29).
- 3.2.13 Further details are provided in ES Chapter 12 and the supporting appendices: Appendix 12.1 – Flood Risk Assessment and Appendix 12.2 – Preliminary Foul Drainage Strategy.

### **Access**

- 3.2.14 Vehicular access to the Site would be taken from a new junction with Long Chaulden to the east (see Figure 3.17 – Proposed J1 Long Chaulden Access) and from The Avenue to the north east (Figure 3.18 - The Avenue Extension Plan). These access points accord with the overall Movement Parameter Plan, Figure 3.1. They are designed to operate with both the first phase of development and the wider scheme as described below.
- 3.2.15 In addition, an emergency access would be provided in the south east corner of the Site with Chaulden Lane, and the proposed self contained gypsy and traveller site and foul pumping station in the south western corner of the site would also have an independent access from Chaulden Lane (see Figure 3.16 - Chaulden Lane Vehicle Access).

## **3.3 Outline component of the application and parameter plans relating to wider site**

- 3.3.1 It is important to note that the outline component of the application for 750 new dwellings and other mixed uses as described at paragraph 3.1.1 above may be refined further at the detailed design stage, although this would be substantially in accordance with the masterplan and the development envelope defined by the parameter plans which are described as follows.

### **ACCESS AND MOVEMENT**

- 3.3.2 Figure 3.1 confirms the access and movement parameters across the wider application Site, confirming the links between the principal access points from Long Chaulden to the east; and The Avenue to the north east, between which would be a primary road loop. The former will also provide a bus route into the Site connecting with the community hub. From this primary road loop would be a secondary road leading to the south east corner of the Site to facilitate a possible future connection to an adjoining land parcel. In addition, it also confirms the links with the emergency access in the south east corner of the Site with Chaulden Lane, and that there would not be a vehicular connection between the wider Site and the proposed self-contained gypsy and traveller site and foul pumping station in the south western corner. A network of pedestrian and leisure routes would also be provided across the Site, including connections to the adjoining residential streets to the east, and the country lanes and footpaths to the north, south and west.
- 3.3.3 Main streets would spur off from the primary and secondary access routes and permeate the development parcels, leading to lanes and private drives. Within the proposed development, the primary route would include design features to act as traffic calming. Footways and cycle paths within the scheme would provide permeability and continuity between the Site and existing

pedestrian facilities.

- 3.3.4 The existing public rights of way (Figure 2.2) which either adjoin or cross the Site are accommodated into the proposals. Footpath 21, which runs along part of the Site's northern boundary from Pouchen End Lane in the north west to the north-eastern corner of the Site where it meets footpath 20 and 22, would be retained as existing. Footpath 20 (which is a component of the Chiltern Way) runs from the intersection of footpaths 21 and 20 in the Site's north-east corner near The Avenue along the north-eastern boundary of the Site to Long Chaulden, would be upgraded to a pedestrian cycle and leisure route as part of the first phase. Footpath 91 which crosses in an east-west direction to the south of the Site centre from Pouchen End Lane to Rowcroft, broadly coincident with the gas pipeline corridor, would be upgraded to become a pedestrian and cycle leisure route. Additional north-south and east-west pedestrian and cycle routes would be provided across the Site.
- 3.3.5 These routes would ensure connectivity to the town and its range of services within walking distance. From the Site, it is about a 2.5km journey to Hemel Hempstead town centre via public right of way 20 via Shrubhill Common.
- 3.3.6 Vehicle and cycle parking will be provided on Site in line with DBC's current parking standards for the first phase, and those applicable at the time of reserved matters applications across the remainder of the Site, using an approach to balance parking provision against the requirement for high quality design.
- 3.3.7 Assessment of the Proposed Development has considered the potentially significant traffic-related environmental effects where the project is likely to alter traffic flows (Chapter 9).

#### DISTRIBUTION OF LAND USES

- 3.3.8 Figure 3.2 shows the principal land use across the Site would be residential development (orange on the Figure), labelled as parcels A1-A7 for the first phase area (as described in detail above) and parcels B - I for the remaining area (submitted in outline). Towards the centre of the Site would be a primary school site plus associated playing fields (yellow on the figure) which could accommodate up to two forms of entry. As explained at paragraph 3.9.8-3.9.9 below, a key constraint for the development is the presence of a high pressure gas main, and Figure 3.2 ensures that the required separation distances for the relevant land uses are met.
- 3.3.9 To the north east of the school would be the community hub (purple on the figure) and this would include uses such as a convenience store, retail units, nursery, a community hall and the care home. In the south west corner of the Site would be the self contained gypsy and traveller site for up to seven pitches with independent access from Chaulden Lane, and a foul water pumping station, all delivered in phase 1 as described above.

#### OPEN SPACE AND GREEN INFRASTRUCTURE

- 3.3.10 Figure 3.3 confirms that open space and green infrastructure would be distributed across the Site and would include the retention and enhancement of areas of existing vegetation, the provision of play and sports facilities and various new leisure footpaths and cycleways. Areas of enhanced provision include: (i) within the first phase, at the Site entrance with Long Chaulden, where provision would be combined with existing and proposed SuDS features as described above; and (ii) coincident with an existing gas main corridor which traverses the Site in a broadly east-west direction to the south of the Site centre, some 500 metres north of Chaulden Lane,

before then traversing south and following the Site's eastern boundary to the Site's south-eastern corner.

#### HYDROLOGY

- 3.3.11 Environment Agency mapping of England defines three zones, numbered 1, 2 and 3, for planning and development purposes. Zones 2 and 3 are generally considered at risk from flooding within the lifetime of a development or settlement. Although statistically, flooding can never be ruled out, Zone 1 (the majority of England), is not considered at measurable risk and therefore it is the preferred location for all development. The entirety of the Application Site lies within Zone 1.
- 3.3.12 A drainage strategy has been prepared for the scheme, which along with the protection of water quality and the management of flood risk, is assessed in Chapter 12 and Figure 3.4 confirms the hydrology parameters across the Site. It confirms a network of attenuation basins, deep bore soakaways, swales and a separate foul water network and pumping station (see Figures 3.6 and 3.7 for the relevant foul and surface water network overview plans). In many cases these are co-located with the green infrastructure and open space set out in Figure 3.3, with various existing and proposed attenuation basins and swales designed to be permanently wet ponds that will provide additional ecological benefits. Deep bore soakaways have also been strategically located around the site as a mitigation measure for the chalk solution occurrence feature explained at para 2.1.12.
- 3.3.13 The SuDS features will provide attenuation for storm events up to 1 in 100 years including an allowance for climate change, which will then discharge either to ground via deep bored soakaways/shallow infiltration basins or to the local surface water sewer under a controlled manner. Further details are provided in Chapter 12.

#### BUILDING HEIGHTS

- 3.3.14 In terms of building heights above finished ground level (Figure 3.5) the LVIA and related chapters have considered three distinct development ridge height categories as shown: up to 15 metres (dark purple on the Figure), up to 13 metres (mid purple on the Figure) and up to 10 metres (light purple on the Figure). The tallest buildings (i.e. up to 15 metres) would be the mixed use buildings located within the community hub and the adjoining residential land parcel to the north east (A2) with building heights then generally falling in all directions across the Site to the boundaries. In terms of the other uses the primary school buildings (light green on the Figure) would have a ridge height of up to 13 metres and the gypsy and traveller site would be limited to up to 6 metres. Any point features such as chimneys have been excluded from these measurements, and Figure 3.5 confirms that heights are from existing ground level, from which a vertical tolerance of +/-2 metres applies.

#### LANDSCAPE AND AMENITY GREENSPACE

- 3.3.15 Key elements of the landscape and amenity proposals are shown on the Green Infrastructure Parameter Plan (Figure 3.3) which is supplemented by the illustrative Green Infrastructure Strategy for the entire site (Figure 3.9). The latter of these is provided in the ES solely to assist in understanding how the landscaping proposed could be delivered.
- 3.3.16 The Long Chaulden Gateway is part of the first phase and has been described at paragraph 3.2.8 above. A reptile receptor / mitigation area will also delivered in the first phase (see Figure



3.31) on the central western part of the site.

- 3.3.17 Other key elements include Pouchen Park which is a linear park proposed in the southern part of the Site, running in a north-south direction adjacent to the Site's eastern boundary and in a east-west direction through the centre of the Site. This is a multi-functional space including the above mentioned reptile receptor/mitigation area, an upgrade to the existing footpath 91 to accommodate bicycle use; dry attenuation basins with some informal play space; swales; new woodland; a community orchard; a local equipped area for play (LEAP) and a new cycle/pedestrian route in a north-south direction.
- 3.3.18 Elsewhere, the landscape strategy retains the majority of the existing shelterbelt, trees and hedgerows around the perimeter of the Site and proposes to reinforce the structure and provide enhanced visual containment.

### 3.4 Foundation assumptions

- 3.4.1 In terms of building foundation options and floor slabs, these have been reviewed in light of the ground conditions, namely the conclusions of the Phase 1 and 2 Geo-Environmental Site Assessment report at Appendix 2.1 confirms that a number of areas of the Site have a low to moderately high probability of chalk solution features. In some circumstances these types of features can increase the risk of subsidence, and also have implications for drainage and soakaway design.
- 3.4.2 In terms of mitigation, the report confirms that alternative options such as piled foundations and suspended floor slabs represent a lower risk, or that an alternative for lighter loaded buildings (such as the residential buildings which dominate the proposals) would be for foundations to pass through the topsoil and bear onto the underlying geological formations.
- 3.4.3 The mitigation measures are summarised in the PBA drawing entitled 'Solution Feature Occurrence Assessment (Update Including Engineering Advice)' which is reproduced in the ES as Figure 3.11, which firstly ascribes a geohazard zone risk rating to each part of the Site ranging from very low through to moderately high. For each zone specific engineering advice is then provided for the proposed built elements of: foundations, road pavements and driveways and soakaway drainage. In summary, for the highest risk areas these recommendations include the following:
- Foundations - the use of raft foundations/grillage of ground beams with cruciform corners and suspended floors;
  - Road pavements and driveways - installation of a concrete raft in sub base over the existing balancing pond at the entrance from Long Chaulden and the incorporation of a high tensile steel geogrid into the sub-base elsewhere; and,
  - Shallow level soakaways to be located at least 20 metres from a structure (foundation), with deep-bore soakaways no closer than 10 metres.

### 3.5 Soil Resources Plan

- 3.5.1 During construction it will important to minimise the handling and movement of heavier textured soils in order to avoid subsequent problems of compaction and smearing, and consideration will need to be given to means of improving the drainage of these soils for their proposed use as recreational and garden media. The primary measures to mitigate the loss of soil resources

during the construction activities will be set out in a soil resources plan, which will confirm the soil types; the most appropriate re-use for the different types of soils; and proposed methods for handling, storing and replacing soils on-site.

- 3.5.2 The aim of the soil resources plan will be to re-use as much of the surplus soil resources on-site in the detailed design of gardens and green spaces. Any surplus soils will be re-used in a sustainable manner (i.e. as close to the Site as possible and to an after-use appropriate to the soil's quality) in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. The soil resources plan will also aim to ensure that the quality of soils retained on-site is maintained by following good practice guidance on soil handling and storage, particularly to avoid compaction and biodegradation of soils that are to be retained on site in storage.
- 3.5.3 Following a soil resources plan and implementation of best practice guidance will ensure that the soil resource is able to retain its other ecosystem functions.

### 3.6 Highways works

- 3.6.1 The transport assessment modelling has identified a number of road junctions that could be altered to enable them to operate more effectively, and locations where path widening could provide an improved shared pedestrian/cycle route. The locations of highways works associated with the proposal, either at the site entrance (Figures 3.16-3.18) or off-site (Figures 3.32-3.36), are as follows:

- In the vicinity of the Site access junctions with Long Chaulden, The Avenue and Chaulden Lane;
- The off-site junction of Boxted Road/The Avenue;
- The off-site junction of Long Chaulden/Northridge Way;
- The off-site junction of Long Chaulden/Hollybush Lane;
- The off-site junction of Long Chaulden/Boxted Road;
- The off-site junction of Warners End Road/Leighton Buzzard Road;
- The off-site junction of Northridge Way/Fishery Road; and,
- The off-site junction of Fishery Road / A4251.

- 3.6.2 Each of these areas has been examined by the assessment team to identify whether these could impact on receptors including trees, landscape, species or heritage assets. The findings are presented in the relevant topic assessment chapters where relevant.

### 3.7 Sustainability , Climate Change and waste

- 3.7.1 In terms of planning, addressing climate change is one of the core land use planning principles which the National Planning Policy Framework (NPPF) expects to underpin both plan-making and decision-taking. It recognises that planning plays a key role in minimising vulnerability, providing resilience and managing the risks associated with climate change.
- 3.7.2 The NPPF states that LPAs should expect new development to:
- comply with adopted Local Plan policies on local requirements for decentralised energy

supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

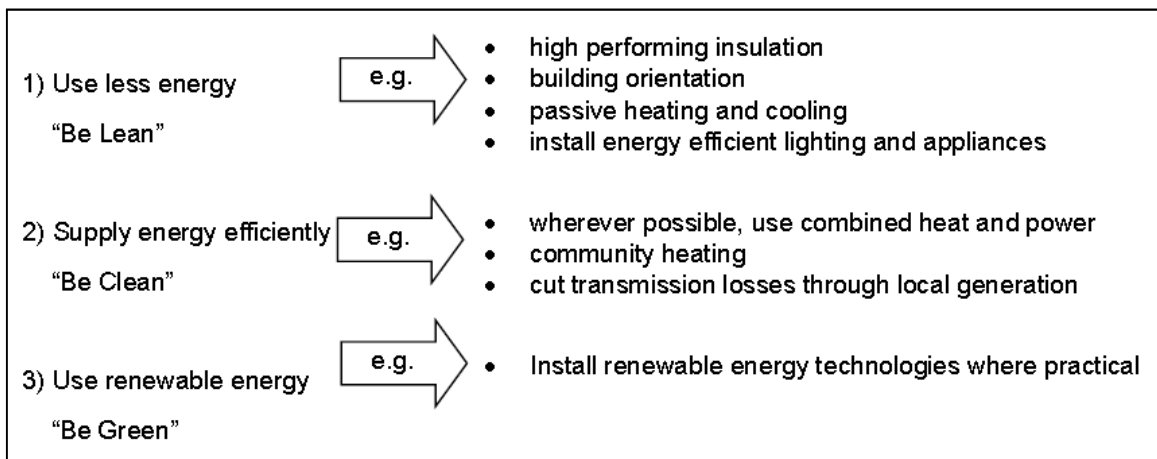
- take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

3.7.3 The Proposed Development comprises an urban extension to Hemel Hempstead, with future residents therefore able to access a range of facilities across the town using non-car modes of transport. In addition, the proposals include a new community hub and primary school within walking distances of the proposed homes, which will meet a wide range of day to day needs.

3.7.4 An effective approach to sustainability seeks the use of efficient designs and insulation products to achieve high levels of thermal efficiency - the 'fabric first' approach. New homes and buildings that benefit from the latest heating systems, very high levels of thermal insulation of walls, floors, ceilings, windows and doors can achieve a substantial reduction of CO<sub>2</sub> emissions when compared to homes and buildings built even within the same decade.

3.7.5 The focus of the design will limit the energy consumption and CO<sub>2</sub> emissions through optimising the building performance together with energy efficiency measures following the steps of the energy hierarchy shown below. It will meet the Local Authorities requirements and the minimum requirement of Part L1A and 2A of UK Building Regulations.

3.7.6 The Proposed Development will implement the principles set out below.



3.7.7 The overarching strategy follows a hierarchy of:

- Using less energy / demand reduction;
- Supplying energy efficiently; and
- Using renewable energy.

3.7.8 Design principles adopted to passively reduce the energy demand through the scheme layout include:

- Areas of green open space will help to reduce the heat island effect by providing evaporative cooling at night;
- Sufficient spaces provided to implement strategic street tree planting to provide solar shading;

- Selection of plot layout to facilitate air movement and optimise natural ventilation; and
- Orientation of development blocks and development form to promote passive solar gain.

3.7.9 This approach will be developed and refined in the design of the buildings to reduce energy requirements through the consideration of:

*Possible Passive measures*

- Optimising the U-values of the external fabric to reduce energy loss (e.g. by providing additional insulation);
- Reducing the air permeability and thermal bridging coefficients of each building envelope;
- Incorporating thermally massive materials to help keep internal temperatures of buildings stable;
- Enlarging window areas to maximise the use of natural day-lighting and enhance passive solar gains, whilst managing overheating;
- Locating plant rooms away from southern elevations to avoid excessive heat gain and allow maximum plant efficiency; and
- Designing windows on two or more aspects (preferably opposite each other) to allow the through-flow of air and provide effective cross ventilation.

*Possible Active measures in the mechanical and electrical elements of buildings:*

- Controls to optimise and compensate for heating variations;
- Zone heating controls (e.g. through the use of Building Management Systems (BMS) where appropriate);
- Time and thermostat control of hot water;
- High efficiency lighting;
- Installing energy display devices to promote user behavioural change;
- Using energy-efficient lighting systems (e.g. daylight cut-off and Passive Infra-Red (PIR) lights);
- Ensuring white goods achieve a high rating in the EU Energy Efficiency Labelling Scheme; and
- Provision of efficiency guidance notes in Home Owner's Packs.

3.7.10 Energy demand and energy use will be reduced through specific interventions including adherence to building regulations and measures will be summarised in the Energy Performance Certificate (EPC) provided to each new occupant of domestic and commercial buildings. Government data shows that homes built in the year to June 2017 use an average of 103kWh/m<sup>2</sup> compared with an average for existing properties of 294kWh/m<sup>2</sup><sup>1</sup>. Energy demand and energy use within the Proposed Development is likely to be significantly lower than the average for the existing housing stock.

3.7.11 Further Climate change and sustainability mitigation and adaptation considerations have been

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<sup>1</sup> HBF Report: You've Got the Power: Energy Efficiency and New Build Homes, October 2017

considered in each topic area of this ES, for example consideration of means to promote sustainable transport, manage surface water drainage and flooding, and deliver planting and landscaping measures resilient to predicted climate change.

### Construction Waste

3.7.12 The Building Research Establishment (BRE) has developed benchmarking to aid in the estimation of construction waste arising at the design stage of a new development. The benchmarks are derived from data reported from a range of completed projects and which are used to inform the SMARTWaste Tool.

3.7.13 Table 3.1 shows the most recent benchmark data (October 2017) for tonnes of construction waste generated per 100m<sup>2</sup> of floor area for new build developments.

**Table 3.1: BRE Construction Waste Benchmarks**

Built development	Tonnes / 100m <sup>2</sup> GIA
Commercial Retail	15.73
Commercial Offices	12.42
Commercial Other	21.02
Education	14.88
Healthcare	13.01
Industrial Buildings	12.38
Leisure	14.79
Public Buildings	13.73
Residential	15.28

Source: BRE Waste Benchmark Data, October 2017

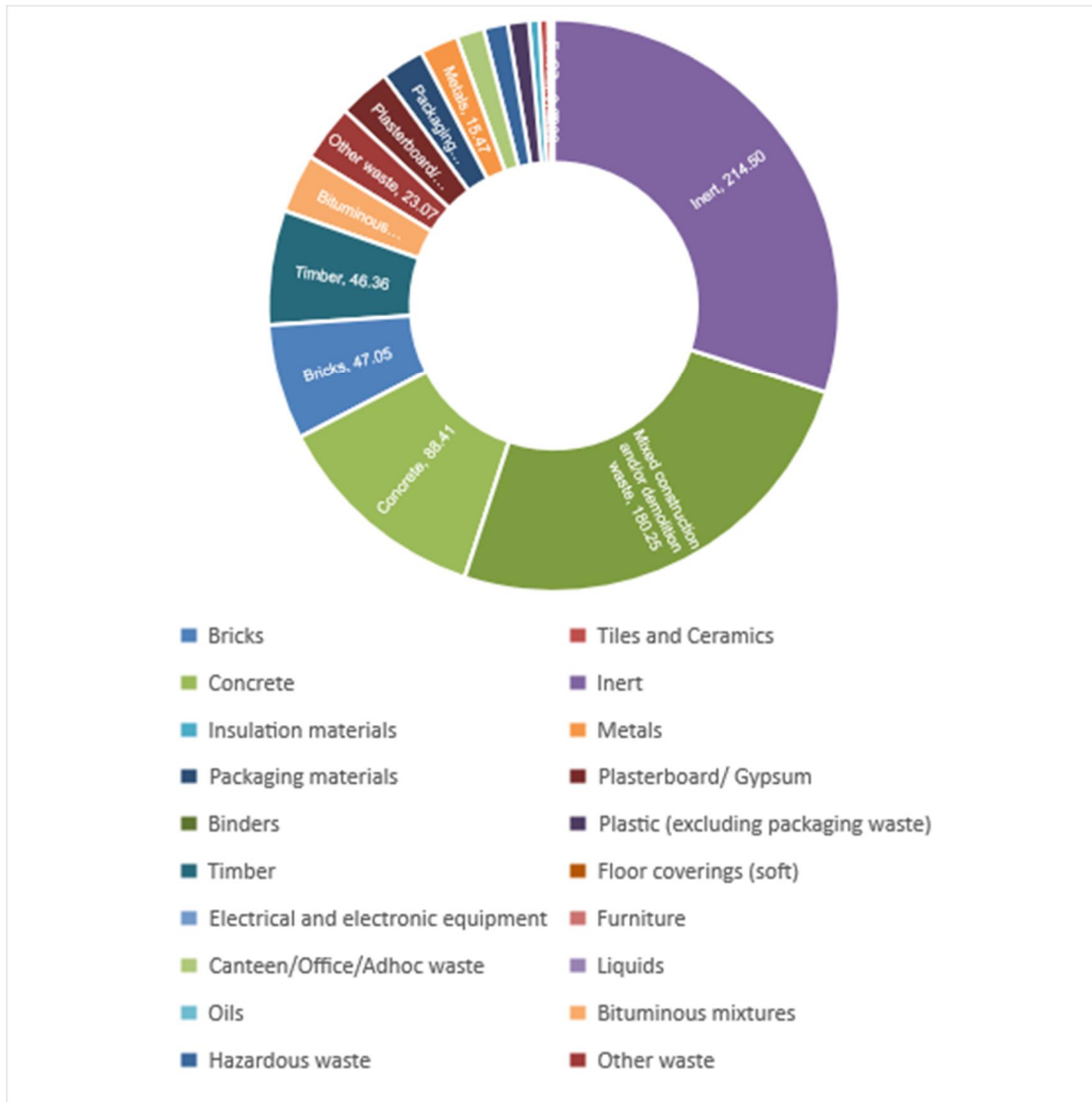
3.7.14 These benchmarks have been used to forecast the construction waste potentially generated in developing the proposal. The figures assume no minimisation, reuse or recycling has taken place. It is therefore the baseline figure from which a reduction in waste arising will be established. Table 3.2 shows the estimated construction waste generation based upon approximate floor areas.

**Table 3.2: Estimated Construction Waste**

	<b>Number</b>	<b>Indicative floor area (m<sup>2</sup>)</b>	<b>Waste (tonnes)</b>
Commercial Retail	4	750	118
Commercial Other (Children's Day Nursery)	1	450	94.57
Education	2-fe	2,500	372
Healthcare (Medical Facility)	1	100	13
Leisure	1	175	25.88
Residential	1,100	100,000	15,127
Residential (Extra-care)	70	3,080	470.62
<b>Total</b>			<b>16,219.07</b>

3.7.15 The estimation shows that in total approximately 16,219 tonnes of waste may arise from the construction of the built development.

3.7.16 The chart below illustrates the general composition of construction waste types that would be generated, based upon SmartWaste benchmark data from UK residential construction projects of a similar nature.



**Typical Residential Construction Waste Composition (Waste Benchmark Data 2017)**

3.7.17 The above figures are based upon standard construction operations in the UK. The estimated volumes identified can be reduced through good waste management practice. Opportunities to avoid and minimise the amount of construction waste will be implemented through effective design, good site practice and a Construction Waste Management Plan.

**Household waste**

3.7.18 When completed and occupied, the Proposed Development will lead to an increase in the volume of household waste generated in the area. According to statistics from the Department for Environment, Food and Rural Affairs, the amount of household waste collected per resident in Dacorum during 2016/2017 was 438 kg, of which 51.1% was recycled<sup>2</sup>. The Council therefore

<sup>2</sup> Department for Environment, Food and Rural Affairs, *Local Authority Collected Waste Statistics: Selected Waste Indicators 2014 to 2017*

performs well against the target for the UK to recycle at least 50% of waste generated by households by 2020<sup>3</sup>.

- 3.7.19 It is estimated that the development of 1,100 homes and a 70-bed extra care unit would generate circa. 607 tonnes of municipal waste each year, of which half would be recycled (based on an anticipated 1,409 new residents to the local area as detailed in Chapter 13).

### 3.8 Phasing of delivery

- 3.8.1 The EIA has used the assumption that land at West Hemel would be delivered over the period 2020 to 2028, some 8 years, but this is dependent on market conditions prevailing over this period. This assumes a delivery rate of approximately 140-170 units per annum with a lower initial delivery in the first phase and early construction years.
- 3.8.2 The application provides full details for approval in respect of the first phase of 350 homes and the associated infrastructure including access points from Long Chaulden and The Avenue, all located in the north east of the Site and thus it is anticipated that construction would commence within this area, and work gradually west and southwards. The exception to this would be the foul pumping station located in the south west corner and the connecting sewer, also part of the full application, where early commencement of work is also likely.

### 3.9 Utilities

#### WATER SUPPLY

- 3.9.1 Water supply mains are situated to the west of the Site in Pouchen End Lane and Affinity Water has confirmed that the water main has sufficient capacity to supply the proposed development site without any off-site reinforcement work.

#### FOUL WATER DISPOSAL AND TREATMENT

- 3.9.2 The foul drainage network in the area is operated by Thames Water Utilities Ltd (TWU) who confirmed that existing networks adjacent to the Site have limited spare foul capacity. For flows up to 100 units TWU have identified a Point of Connection to an existing manhole on Long Chaulden to the east of the Site. For flows beyond 100 units TWU have identified a Point of Connection at the inlet of the existing Berkhamsted Waste Water Treatment Works (WWTW) some 1.96km to the south west of the Site.
- 3.9.3 In order to connect the Proposed Development to this Point of Connection it will be necessary to construct an on site pumping station and a new dedicated off site rising main between the Site and Berkhamsted WWTW. This off site sewer will be procured through a Section 98 requisition in accordance with the Water Industry Act 1991. Further details are confirmed in the Foul Drainage Strategy for the Development provided at appendix 12.2.
- 3.9.4 The route of the new sewer (see Figure 3.37 - Off-site sewer – route of proposed rising main to Berkhamsted WWTW) will be from the proposed pumping station in the south west corner of the Proposed Development, routing entirely along the public highway first west along Chaulden Lane then south beneath the railway bridge at Winkwell, and then west along Pix Farm Lane to

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<sup>3</sup> Waste Framework Directive 2008/98/EC



the existing WWTW access road. This route has been examined by the assessment team to identify whether these could impact on trees, landscape, species or heritage. The findings of no significant impacts are presented in the relevant topic assessment chapters.

## ELECTRICITY

- 3.9.5 In terms of providing electricity to the Proposed Development, there are high voltage underground cables both to the north of the Site on Pouchen End Lane near Field End Farm and to the east in Warners End Road. A suitable point of connection has been discussed with UK Power Networks and the need for upgrading works has been confirmed.

## GAS

- 3.9.6 Gas is distributed across the UK through a transmission system comprising a national network of pipelines.
- 3.9.7 In terms of providing gas to the Proposed Development, Cadent Gas has confirmed that there is a medium pressure gas mains to the east of the Site in Long Chaulden and a point of connection has been outlined.
- 3.9.8 The drive towards urban regeneration and sustainable urban extensions means that sites crossed by or close to high pressure gas mains are being identified for development. The UK onshore pipeline operator's association (UKOPA) provides advice to developers, local planning authorities and others on statutory safety clearances that must be maintained by any new development, the industry's maintenance requirements, and similar technical issues. In summary, statutory safety clearances are prescribed with additional detailed advice provided by the Health and Safety Executive (HSE) and National Grid Gas to define safe distances between new buildings or other development constructed close to high pressure gas mains.
- 3.9.9 The development proposals at West Hemel have been formulated in consultation with the HSE. In basic terms the illustrative masterplan (Figure 3.8 and the suite of parameter plans (Figure 3.1-3.5) meet the HSE requirements confirmed in pre-application correspondence (Appendix 3.1 – HSE letter of 1 December 2016):
- 'inner zone' 0-17 metres from pipe centre –proposed development and land uses are restricted to: landscaping including sustainable urban drainage systems (SUDS), roads and gardens attached to houses.
  - 'middle zone' 17-55 metres from pipe centre – in addition to the inner zone uses, the proposed development and land uses would be restricted to: a maximum of 30 dwellings at a maximum density of 40 dwellings per hectare (building footprint), roads, drives and frontages to dwellings, gardens and play areas.
  - 'outer zone' 55-70 metres from pipe centre – in addition to the middle and outer zone uses, the proposed development and land uses would be restricted to, schools up to 1.4 hectares in size, care homes up to 0.25 hectares. There is no restriction on residential uses.

## 3.10 Cumulative effects

- 3.10.1 Whilst this ES supports the application at West Hemel, the effect of the proposal has been considered where appropriate in combination with 'other development' existing and approved within the surrounding area.

- 3.10.2 The requirement for cumulative effects assessment (CEA) is set out in Article 4(3) and Article 5(1) of the Environmental Impact Assessment (EIA) Directive. Schedule 3, paragraph 14 of the EIA Regulations (2011, as amended) (see paragraph 1.2.3 which confirms the EIA Regulations applicable to this project) which refers to the selection criteria for screening Schedule 2 development, states that *'the characteristics of the development must be considered having regard, in particular, to... ..(b) the cumulation with other development'*.
- 3.10.3 In relation to the information for inclusion in an ES, Schedule 4 Part 1 of the EIA Regulations (para 21) refers, inter alia, to cumulative effects resulting from *'(a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste,'* (paragraph 20) and *'a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment'*.
- 3.10.4 The Planning Practice Guidance (Planning Paragraph: 024 Reference ID: 4-024-20140306, Revision date: 06 03 2014 ) states the following regarding when the need to assess cumulative effects arises:
- 'Each application (or request for a screening opinion) should be considered on its own merits. There are occasions where other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development. There could also be circumstances where two or more applications for development should be considered together. For example, where the applications in question are not directly in competition with one another, so that both or all of them might be approved, and where the overall combined environmental impact of the proposals might be greater or have different effects than the sum of their separate parts (our emphasis)'.*
- 3.10.5 It is therefore clear that PPG requires a cumulative assessment of existing or unimplemented approved development. The DBC formal EIA Scoping Opinion accords with this approach and recognises that a cumulative effects assessment is limited by the sufficiency of the available information.
- 3.10.6 An allied, but more uncertain category would be submitted planning applications which are not yet determined as they could be refused permission, amended before permission is granted in the future or subject to significant planning conditions, any of which could result in less certainty as to whether they will be implemented as currently proposed.
- 3.10.7 Following consultation with DBC the following applications were identified as candidates for further consideration in a cumulative effects assessment:
- Land off Dacorum Way between Marlowes, Combe Street and River Gade, Hemel Hempstead, HP1 1HL (4/03624/14/MOA) – outline permission granted in June 2015 for residential development (up to 207 units) and ancillary retail unit (up to 375 sq m).
  - Symbio Place, Whiteleaf Road, Hemel Hempstead, HP3 9PH (4/03441/15/MFA) – full permission granted in July 2016 for demolition and replacement of a 4 storey office building with 16 storey residential development, featuring 272 apartments, on-site gym, leisure facilities, coffee shop, roof garden, internal arboretum, function room and underground parking facilities.
  - Martindale JMP School, Boxted Road, Hemel Hempstead, HP1 2QS (4/01630/17/MFA) – Residential Development on former Martindale School site to provide 65 new dwellings (amended scheme) approved in October 2017. (NB

previous approval for 43 dwellings on the same site was reference 4/00925/14/MOA granted in February 2015).

- St Marys Dominican Convent, Green End Road, Hemel Hempstead, HP11 1QW (4/00493/16/FUL) – Change of use of existing buildings from class C2 to class C3 dwelling house, alterations and refurbishment of listed buildings granted in June 2016. This will provide 20 additional residential units and the refurbishment of one existing residential unit.

3.10.8 In addition, there are circa 1.32 hectares of land to the south east of the Site which, whilst in separate ownership, form part of the same allocation confirmed in the Dacorum Site Allocations DPD LA3 – West Hemel. However, as there are no detailed planning application proposals to assess at the time this ES was compiled, a CEA of this possible future development site is not possible. It is however relevant that the Proposed Development makes provision for a possible future highways connection to this land, with the illustrative masterplan (Figure 3.8) demonstrating broad compatibility. Should proposals on this adjoining Site ultimately come forward, that applicant would of course need to consider cumulative effects arising at that time, as necessary. In any event the developable area of this parcel, once a gas pipeline buffer has been taken into account, has been determined as circa 0.62 hectares which at a density of 35 dwellings per hectare could produce circa 22 residential units. Given the non-developable area of the gas pipeline buffer is likely to be available for recreation and ecological uses, it is also likely that sufficient amenity space and ecological habitat could be provided on Site. In light of the above, a high level assessment is likely to conclude that the cumulative effects arising with this parcel are likely to be negligible.

3.10.9 Where relevant a cumulative effects assessment has been provided within the topic specific chapters considering the above. In addition, the transport, air quality and noise chapters, which are based on the submitted transport assessment include flows from 'committed development' in accordance with the requirements of Hertfordshire County Council as highways authority.