

E1.5

# ES Chapter 5 - The Development

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THE CROWN  
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East Hemel

## 5. The Development

### 5.1 Introduction

5.1.1 Schedule 4, Part 1 of the 2017 EIA Regulations outlines the information that should be provided within an Environmental Statement (ES) which includes:

- (a) *"A description of the location of the development;*
- (b) *A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land use requirements during the construction and operational phases;*
- (c) *A description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;*
- (d) *An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases)."*

5.1.2 The information presented in this Chapter, alongside the description of the Site provided in **ES Volume 2, Chapter 3: Existing Land Uses and Activities**, the description of the Development as provided on the planning application form (see Paragraph 5.2.1), the plans submitted for approval (see **Table 5.1**) and the Design Specification and Spatial Principles document form the basis of the EIA and provides the level of detail required to enable the assessment of environmental effects in line with the 2017 EIA Regulations.

5.1.3 This Chapter and the accompanying figures will provide a description of the proposed land uses, quantum and scale of development proposed, the means of access proposed and describes the Development in line with Schedule 4 of the EIA Regulations. In line with Schedule 4 of the EIA Regulations, a description of the broad construction methods and processes are presented within **ES Volume 2, Chapter 6: The Works**.

### 5.2 Description of Development

5.2.1 The description of development, as provided on the Outline Planning Application's form, is as follows:

*"Outline application for: urban extension comprising two new neighbourhoods and a new employment zone. The development to include new dwellings (including affordable housing and specialist accommodation for older people); new employment and industrial floorspace and ancillary facilities, a sports hub and Sports Pitches; green infrastructure and landscaping works (to include a country park, formal and informal open space, amenity space, Suitable Alternative Natural Greenspace, managed woodland, ecological areas); early years, nursery, primary and secondary education facilities; local centre uses (to include retail, community and employment uses; health and fitness, gym and other cultural and recreational uses; medical centre; transport mobility hubs; drainage works (including foul and surface water drainage*

*infrastructure); ancillary infrastructure works; vehicular and active travel infrastructure; improvements to the Nickey Line and delivery of a proportion of the Hemel Garden Communities Green Loop; land for Gypsy and Traveller pitches; provision of an active travel bridge over the A414; safeguarded land for M1 Junction 8 improvements; ground remodelling, acoustic bund, engineering and demolition works. All matters reserved save for access from the A414/Green Lane junction and access from the B487/ Hemel Hempstead Road (Redbourn Road)."*

5.2.2 In summary, the Development comprises:

- Up to 4,000 new dwellings (Class C3) including up to 640 elderly care / extra care units (Class C2 residential institutions) and 16 supported living units.
- Up to 190,600 sqm of Employment Use including up to 54,500 sqm Business and Research & Development (Class E(g)); and up to 104,250 sqm Distribution (Class B8); and up to 31,850 sqm Mixed Industrial Uses (Class B2 / Class E(g)(iii)).
- Three Primary Schools (Class F1) incorporating Early Years provision on sites of 2.03ha per 2FE school site, and 2.92ha per 3FE school site (up to 7.87ha in total).
- Secondary School (Class F1) for up to eight forms of entry on a site of not more than 10.78 hectares.
- Up to 2,000 sqm in total of Community Uses (Classes F1 and F2) including community centres and meeting places, library use, places of worship and other community facilities.
- Up to 2,300 sqm of health care services (Class E(e) including medical and dental services.
- Up to 18.8ha for a Sports Hub and Sports Pitches including up to 3,400 sqm in total of sports hub uses in Class E(d). Up to 775 sqm health and fitness, gym and other cultural and recreational uses in Class E(d).
- Up to 525 sqm nursery uses in Class E(f).
- Up to 76.8 ha of Suitable Alternative Natural Greenspace (SANG).
- Green infrastructure and landscape works to include a country park, formal and informal open space, including natural / semi-natural open space, parks & gardens, amenity space, managed woodland, ecology areas and links including mitigation works, green corridors, outdoor sports facilities including changing facilities, play areas, allotments and associated lighting and infrastructure.
- Ancillary infrastructure works.
- Transport Mobility hubs.
- An active travel (pedestrian and cycle) bridge over the A414.
- Vehicular and active travel access points and connections to the surrounding highway.
- Vehicular and cycle parking including electric vehicle charging points.
- Pedestrian, cycle, equestrian, vehicle and bus routes, with associated bus stops, crossings, street furniture and lighting.
- Improvements to existing Public Rights of Way (PRoW).

- Improvements to the Nickey Line through the Site. Delivery of the Hemel Garden Communities (HGC) Green Loop through the Site.
- Land for up to 40 Gypsy and Traveller pitches.
- Safeguarded land for M1 Junction 8 improvements.
- Engineering works including ground remodelling.
- Creation of bunds (incorporating acoustic fencing) adjacent to the M1 motorway.
- Any necessary demolition of existing buildings.
- Retention of and improvements to listed buildings (subject to separate Listed Building Consent).
- Infrastructure works (comprising energy/utilities provision and diversions as necessary).
- Drainage works including foul drainage infrastructure, sustainable drainage systems and multi-function stormwater attenuation features.

## 5.3 Development Parameters

5.3.1 As detailed in **ES Volume 2, Chapter 2: EIA Methodology**, the Outline Planning Application seeks to establish the maximum parameters of the Development. The Outline Planning Application is supported by three Parameter Plans and two Testing Plans which set the spatial parameters for the Development and will set the context for subsequent detailed design. The Parameter Plans have been submitted to SADC and DBC for approval whereas compliance at reserved matters stages with the Testing Plans will be secured by way of a suitably worded planning condition. The Parameter Plans and Testing Plans are identified in **Table 5.1**.

**Table 5.1: Planning Application Drawings Tested in the EIA**

Drawing	Drawing Reference	ES Figure Reference
<b>Parameter Plans</b>		
Land Use Parameter Plan	EHUK_PRP_XXX_XXX_DR_T_00001 - Land Use Parameter Plan	ES Volume 2, Chapter 5: The Development, Figure 5.1
Green Infrastructure Parameter Plan	EHUK_PRP_XXX_XXX_DR_T_00002 - Green Infrastructure Parameter Plan	ES Volume 2, Chapter 5: The Development, Figure 5.6
Access and Movement Parameter Plan	EHUK_PRP_XXX_XXX_DR_T_00003 - Access and Movement Parameter Plan	ES Volume 2, Chapter 5: The Development, Figure 5.3
<b>Testing Plans</b>		

Drawing	Drawing Reference	ES Figure Reference
Heights Testing Plan <sup>1</sup>	EHUK_PRP_XXX_XXX_DR_T_00004 – Heights Plan	ES Volume 2, Chapter 5: The Development, Figure 5.2
Demolition Testing Plan <sup>2</sup>	EHUK_PRP_XXX_XXX_DR_T_00005 – Demolition Plan	ES Volume 2, Chapter 6: The Works, Figure 6.1
Junction Plans		
B487 Hemel Hempstead Road (Redbourn Road) Junction	EHUKVEC-ZZZ-XXX-SK-CR-00082.1	ES Volume 2, Chapter 5: The Development, Figure 5.4
A414 / Green Lane Junction Layout	EHUKVEC-ZZZ-XXX-DR-CR-00084.1	ES Volume 2, Chapter 5: The Development, Figure 5.5

5.3.2 Although the majority of the Development is submitted in Outline, there are two elements which are submitted in detail and not 'reserved' for subsequent approval:

- A414 / Green Lane Junction; and
- B487 Hemel Hempstead Road (Redbourn Road) Junction Works.

5.3.3 Detailed plans showing the works proposed at these junctions are submitted for approval as part of the Outline Planning Application.

5.3.4 The Development Specification details the use and amount of development that the Outline Planning Application seeks to secure (see **Table 5.2**), as well as a set of Spatial Principles which provide an explanation of the key principles which will govern the detailed design and delivery of each of the spatial elements set out in the Parameter and Testing Plans.

5.3.5 The description of the Development provided in this Chapter, together with the Parameter Plans and Application Drawings submitted for approval, form the basis for the assessments presented in **ES Volume 2, Chapters 7 to 16**. The Development Specification will inform any subsequent Reserved Matters applications and sets out how the Development could be built out within the approved parameters and any planning permission granted would be subject to a condition requiring Reserved Matters applications to adhere to the Design Specification.

<sup>1</sup> The Heights Testing Plan is not submitted for Approval. However it forms the basis for EIA Testing and any subsequent Reserved Matters applications will have to adhere to the maximum heights tested in the EIA to ensure the ongoing validity of the ES.

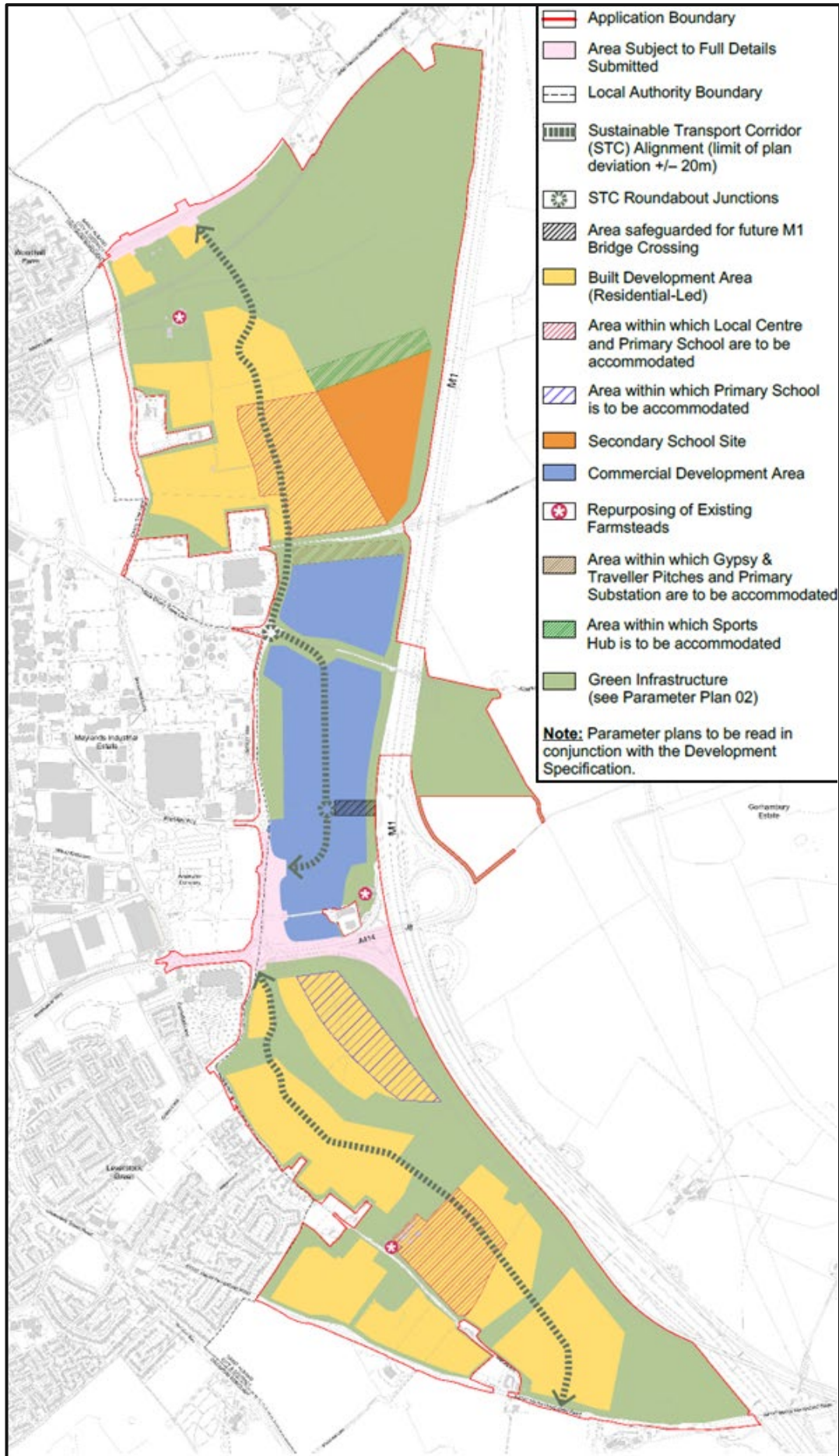
<sup>2</sup> The Demolition Testing Plan is not submitted for Approval. However it forms the basis for EIA Testing and any subsequent Reserved Matters applications will have to adhere to it to ensure the ongoing validity of the ES.

- 5.3.6 It is intended that the details of the Development, which will be the subject to future Reserved Matters applications, will fall within the parameters laid down by the Application and upon which the EIA has been based.

## 5.4 Land Use and Quantum of Development

- 5.4.1 The proposed land uses and their location within the Site are shown on the Land Use Parameter Plan (see **Figure 5.1**) and the maximum quantum of development by land use class is shown on the Schedule of Accommodation below (see **Table 5.2**).

Figure 5.1: Land Use Parameter Plan



**Table 5.2: Schedule of Accommodation**

Use		Use Class	Quantum of Development (maximum unless stated otherwise)
Residential	Dwellings	C3	Minimum 3,360 dwellings Maximum 4,000 dwellings
	Residential Institution (extra care)	C2	640 dwellings
Retail and Services	Retail, services, food and drink	E	4,500 sqm
Community and Leisure	Medical services	E	2,300 sqm
	Community centres and meeting places, library, places of worship and community facilities	F1 and F2	2,000 sqm
	Sports Hub	E(d)	3,400 sqm
	Health and fitness, gym and other cultural and recreational	E(d)	775 sqm
	Nursery	E(f)	525 sqm
	Primary schools	F1	7.87 ha
Employment	Secondary schools	F1	10.78 ha
	Storage and distribution	B8	104,250 sqm (GEA)
	General industrial	B2 / E(g)(iii)	31,850 sqm (GEA)
	Business use, offices and research and development	E(g)(i) and (ii)	54,500 sqm (GEA)
Formal Open Space	Outdoor sports including changing facilities	F2	Up to 18.8 ha

### Residential Dwellings (Use Class C2 and C3)

5.4.2 The Development comprises up to 4,000 residential units across the northern and southern neighbourhoods of the Site. Whilst the exact housing mix would depend upon market conditions and SADC's priorities in terms of affordable housing provision, an indicative housing mix has been used to inform the development of the illustrative masterplan and has been used for assessment purposes within the ES. For the purpose of EIA testing it has been assumed that there would be a mixture of flats and houses of between 1 to 4 beds, and of a range of tenure types, the proportion of which would broadly align with the South West Hertfordshire Local Housing Needs Assessment<sup>3</sup>, as presented within **Table 5.3** below. Within the 4,000 residential units there would be up to 640 elderly care / extra care units (Use Class C2) and 16 supported living units. The exact mix would be determined at Reserved Matters stage, but the housing mix presented in **Table 5.3** is considered to represent a reasonably foreseeable breakdown capable of being used for assessment purposes.

**Table 5.3: Indicative Housing Mix for EIA Purposes**

Dwelling Type	No. of Bedrooms	Total	Social Rent	Affordable	Market
Flats	1-Bed	106	46	31	29
	2-Bed	246	69	61	115
	3-Bed	386	81	46	259
	4-Bed	223	35	15	173
Houses	1-Bed	334	146	97	91
	2-Bed	778	219	195	365
	3-Bed	1,222	255	146	821
	4-Bed	705	109	49	547
<b>Total</b>	N/A	<b>4,000</b>	<b>960</b>	<b>640</b>	<b>2,400</b>

### Local Centre (Use Class E and Sui Generis)

5.4.3 There would be two mixed-use Local Centres across the Development, located centrally within the northern and southern neighbourhood areas. Both are situated close to the Sustainable Travel Corridor (STC) and with links to the surrounding neighbourhoods.

### Education (Use Class F1)

5.4.4 Three primary schools are proposed within the Site. The locations of these are identified within the Land Use Parameter Plan (**Figure 5.1**). One three form entry primary school plus early years would be provided within the

<sup>3</sup> Icení (2024), South West Herts Local Housing Needs Assessment Update: Final Report.

northern neighbourhood. Within the southern neighbourhood, one three form entry and one two form entry primary schools plus early years would be provided.

5.4.5 An eight-form entry secondary school would be provided within the northern neighbourhood.

### **Commercial (Use Classes B8, B2, E(g)(i) and E(g)(ii))**

5.4.6 As seen in **Figure 5.1**, the main employment uses would be in the Commercial Area within the central area of the Development. Employment uses would include storage and distribution (B8 Use), general industrial (B2 and E(g)(iii)), business use, offices and research and development (E(g)(i), (ii) and (iii)) uses.

### **Gypsy and Traveller**

5.4.7 The Development would facilitate up to 20 Gypsy and Traveller pitches within the northern part of the Commercial Area as shown on **Figure 5.1**. Up to another 20 Gypsy and Traveller pitches would be provided within the southern residential area. Precise locations of these would be established at Reserved Matters stage.

### **Repurposing of Existing Farmsteads**

5.4.8 As shown on the Land Use Parameter Plan (**Figure 5.1**) the existing farmsteads at Wood End Farm and Westwick Farm will be repurposed. Listed Buildings at Wood End Farm will be retained and restored, and will be utilised as community, retail, food and beverage, visitor or office space related to the Country Park and the development and stewardship operations. Non-Listed Buildings may be retained and repurposed or may be demolished and replaced with buildings of a similar scale and agricultural character to retain the farmstead qualities. Listed Buildings at Westwick Farm will be retained and restored, and will be utilised as community, retail, food and beverage and office space. Non-Listed Buildings may be retained and repurposed or may be demolished and replaced with buildings of a similar scale and character. The farmstead will form part of the southern local centre.

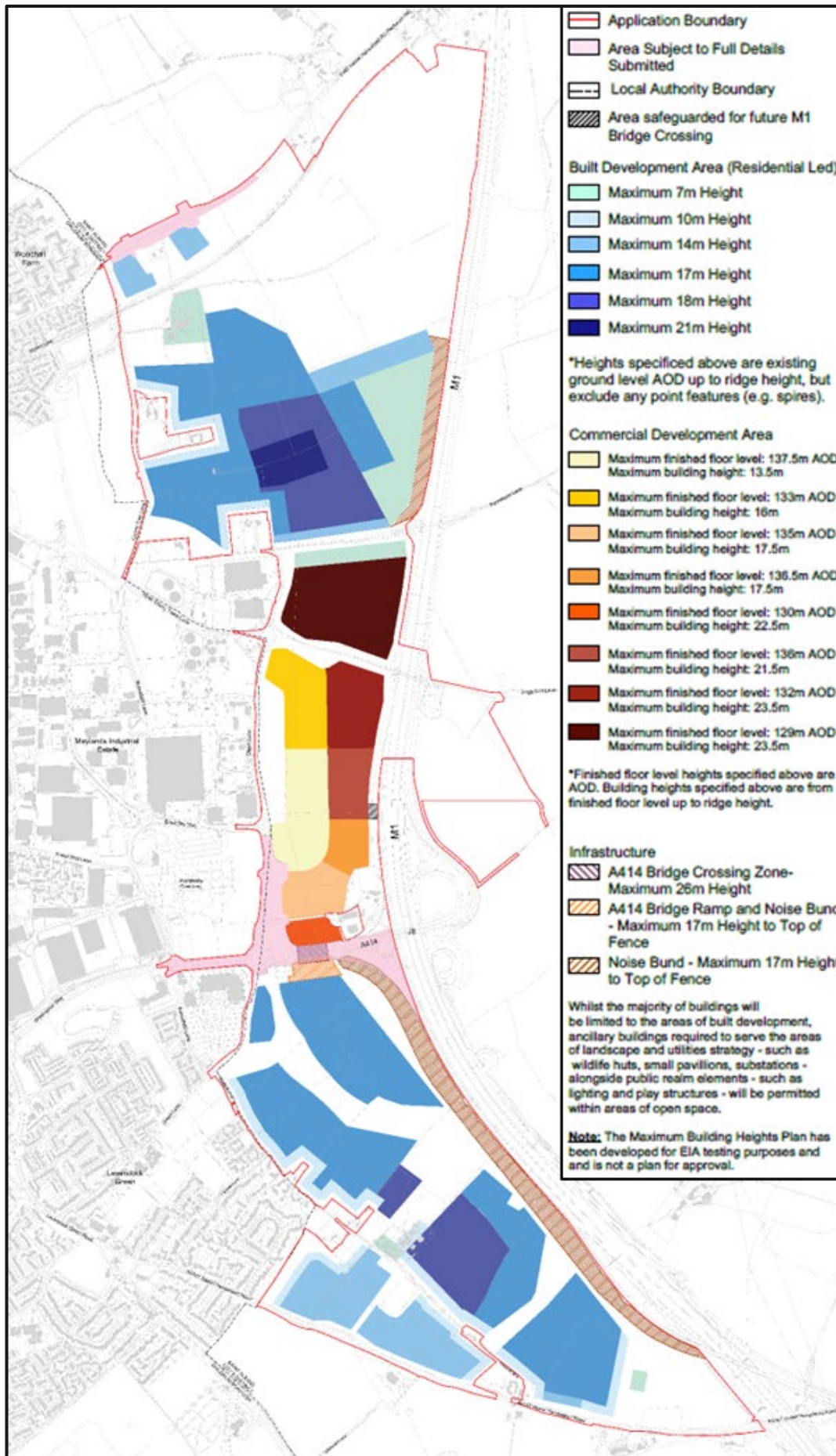
## **5.5 Scale and Massing**

5.5.1 The maximum building heights for the Development are shown on **Figure 5.2**. The scale and massing of the Development have been designed to respond to the constraints and opportunities on and off Site and to respond to the surrounding context.

5.5.2 **Figure 5.2** sets the maximum allowable building heights across the Site that have been used to inform the Landscape and Visual Impact and Built Heritage assessment to understand the potential visual impact of the Development on its surrounds. Within the residential areas, heights shown are in metres from existing site levels Above Ordnance Datum (AOD), measured to the ridge height of any buildings. Within the Commercial Area, due to the larger footprint buildings proposed, heights are shown in meters above proposed Finished Floor Levels (FFL) which themselves have set maximum heights AOD.

- 5.5.3 Within the northern neighbourhood, the maximum heights of the buildings would be between 7m and 21m from existing site levels AOD. The tallest buildings in the northern part of the Site would be associated with the Local Centre. Within the southern neighbourhood, the maximum heights of the buildings would be between 7m and 18m from existing site levels AOD and again would be associated with the Local Centre. Although not fixed at this stage, the heights plan allows for a predominantly 2-3 storey urban fabric, with 2 storeys at sensitive edges, punctuated by 4-storey flats in certain gateway locations and rising to a maximum of 5 storeys within the southern local centre, and 6 storeys within the northern local centre.
- 5.5.4 Within the Commercial Area, finished floor levels would be set between 129m AOD and 137.5m AOD. Building heights would range from 13m - 23.5m with the tallest buildings located in the eastern part of this area of the Site.
- 5.5.5 The Heights Plan (**Figure 5.2**) also shows the maximum heights for infrastructure within the Development. The A414 pedestrian bridge would have a maximum height of 26m from existing site levels AOD, with the bridge ramps being a maximum height of 17m from existing site levels AOD. The noise bund which runs alongside the eastern edges of both residential development areas would have a maximum height of 17m from existing site levels AOD.

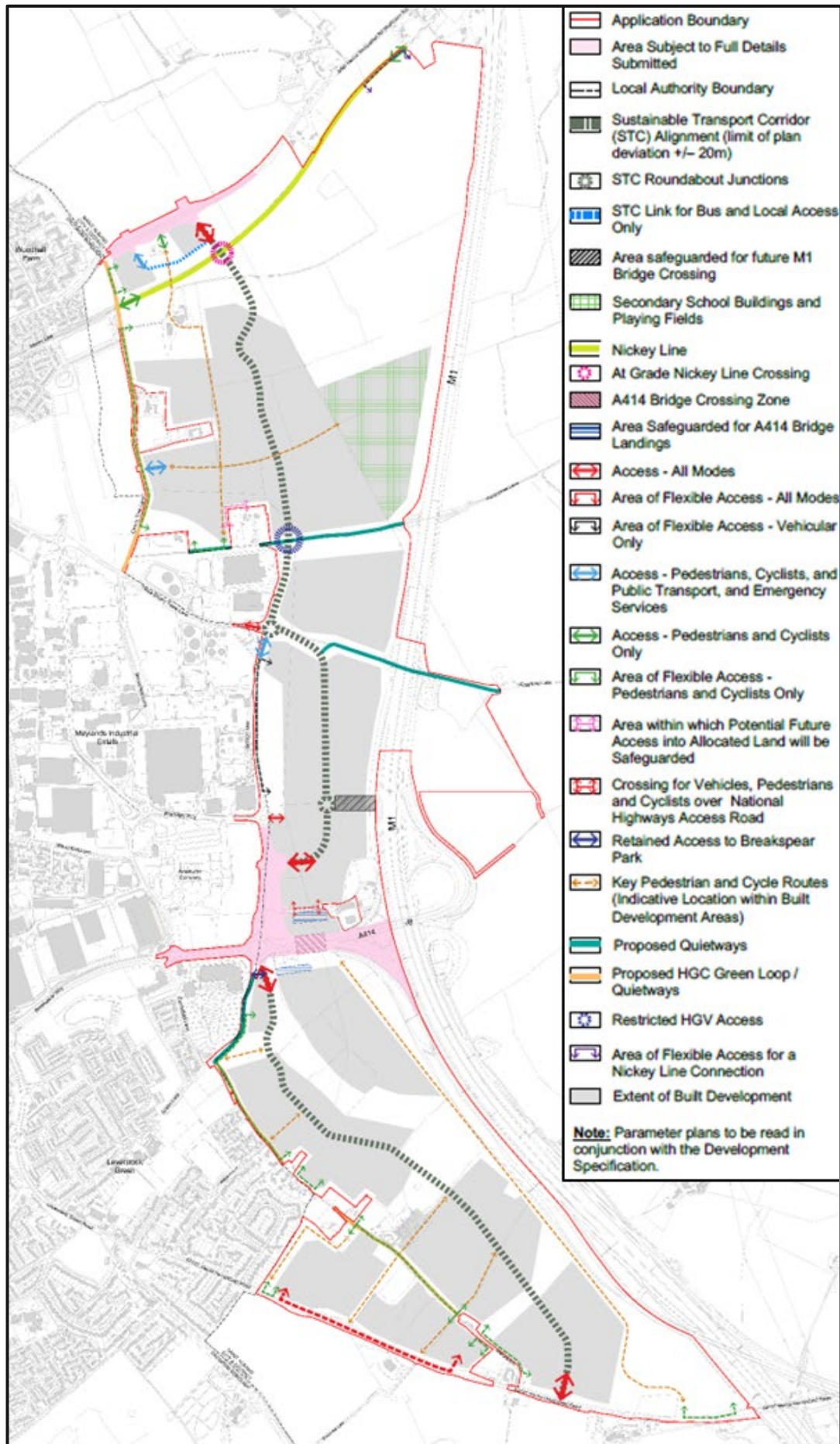
Figure 5.2: Heights Testing Plan



## 5.6 Movement, Circulation and Access

- 5.6.1 The proposed access points and circulation routes associated with the Development are shown on **Figure 5.3** below.

Figure 5.3: Access and Movement Parameter Plan



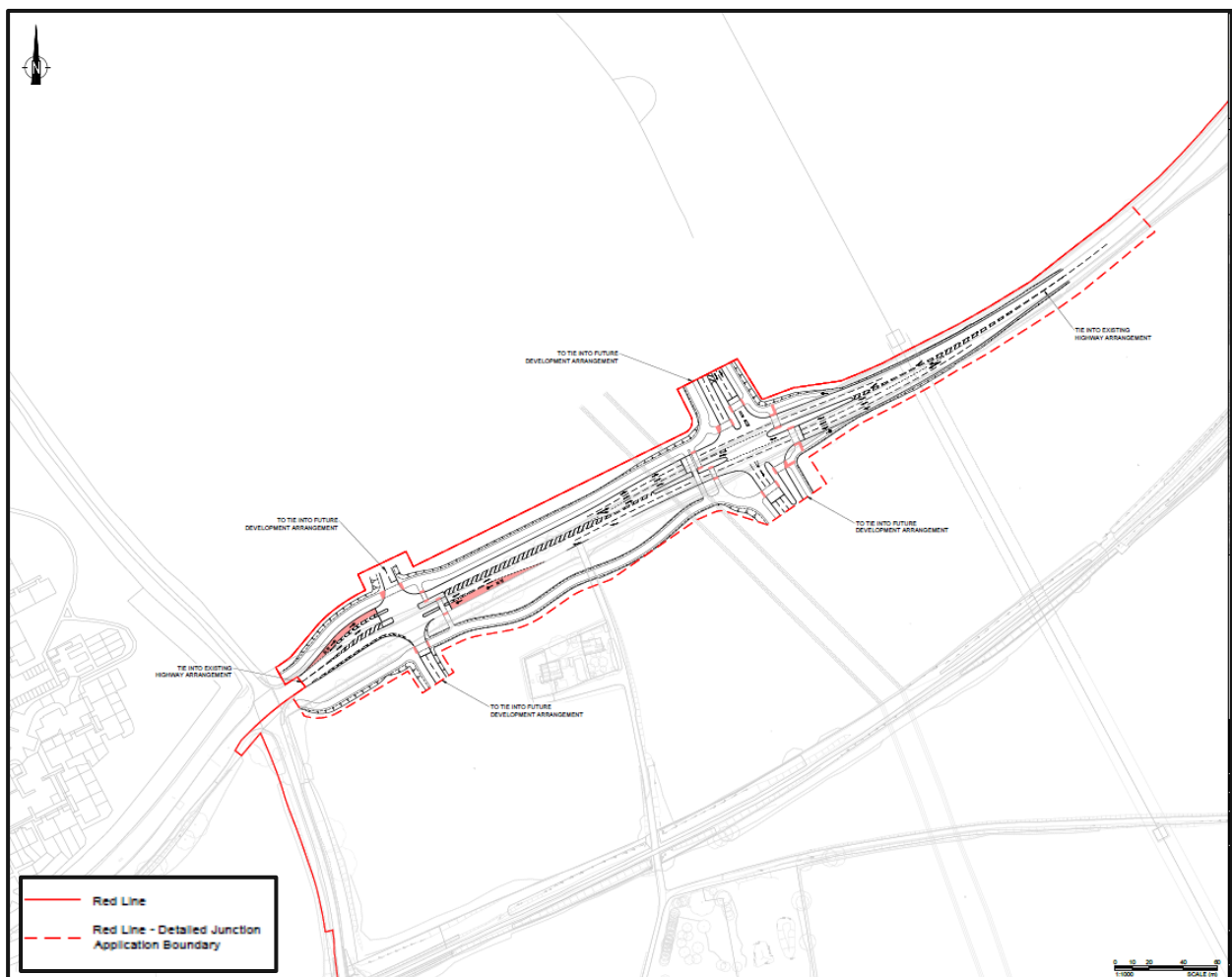
## Vehicular Site Access

5.6.2 Principal Site access for vehicles will be provided through three junctions located on the B487 Hemel Hempstead Road (Redbourn Road), the A4147 St Albans Road and the A414 Breakspear Way. The access point from B487 Hemel Hempstead Road (Redbourn Road) would also provide access to the North Hemel Development located north of the Development (see **Figure 5.4**). Details of the B487 Hemel Hempstead Road (Redbourn Road) junction and A414 Breakspear Way junction (see **Figure 5.5**) are being submitted in detail as part of the Outline Planning Application (i.e. not as a Reserved Matters application).

### B487 Hemel Hempstead Road (Redbourn Road) Access

5.6.3 The proposed layout for the B487 Hemel Hempstead (Redbourn Road) junction is shown in **Figure 5.4**. The main element of the junction comprises a three-lane entry on the east, west and southern approaches, with a two-lane entry on the northern approach.

**Figure 5.4: Redbourn Road Junction Layout**



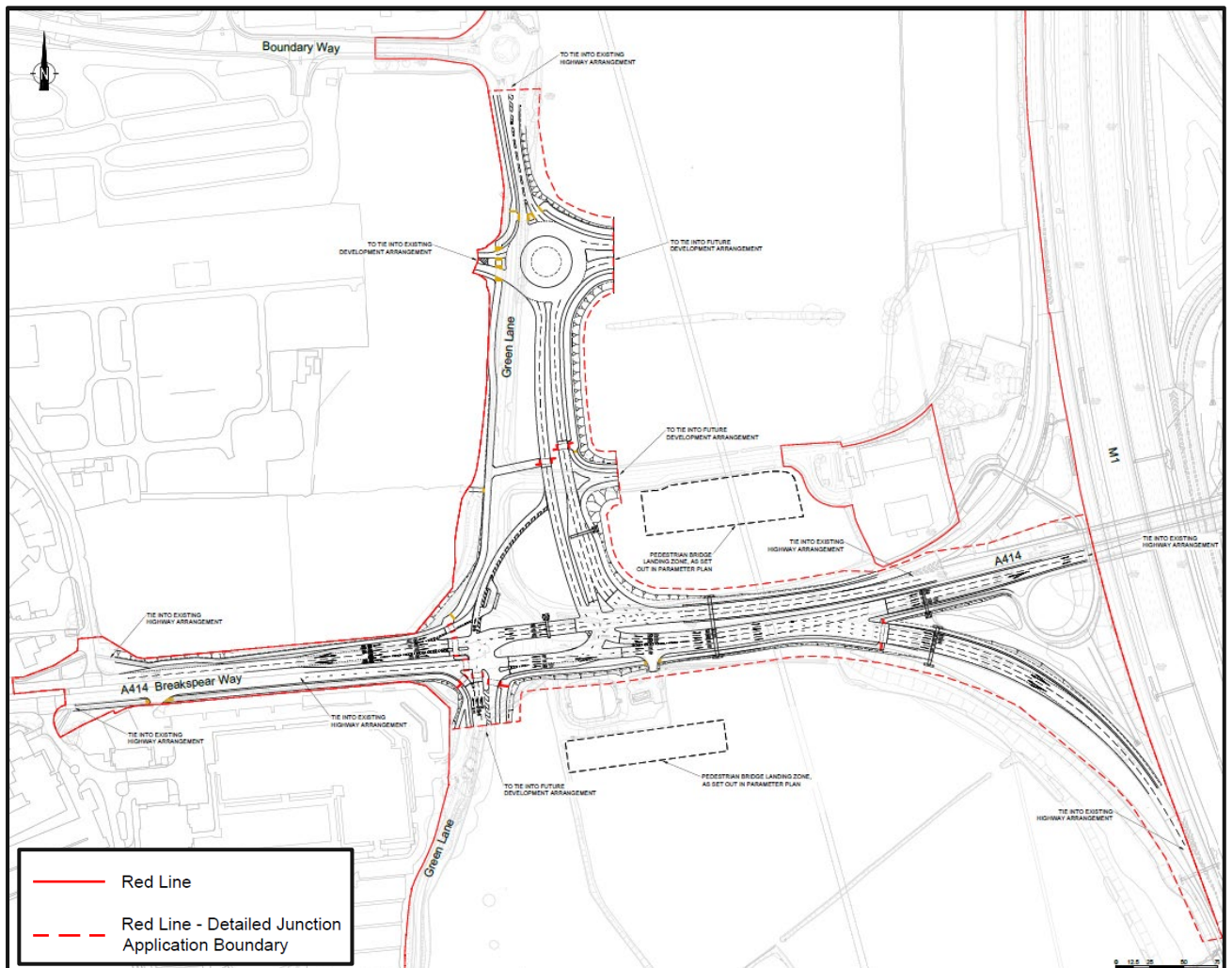
5.6.4 A separate bus-only access / egress is provided to the west of the main junction. This will have a bus gate and only allow buses travelling to and from the west on Redbourn Road and those travelling north-south between East Hemel and North Hemel.

**A414 / Green Lane Access**

5.6.5 The proposed layout for the A414 / Green Lane access is shown in **Figure 5.5**. The existing roundabout at A414 / Breakspear Way / Green Lane would be replaced with a large staggered signalised junction. Key changes include:

- Dualling of Green Lane (north);
- Widening of A414; and
- Dedicated lanes for turning movements to the East Hemel site and existing Maylands area.

**Figure 5.5: A414 / Green Lane Junction Layout**



## Car and Cycle Parking

- 5.6.6 Car parking would be accommodated in line with the provisions of the Local Plan. At each stage, an appropriate parking strategy would be prepared and agreed with the LPA. Parking standards will be set with the objective of reducing car use and encouraging active travel modes, public transport and shared transport.
- 5.6.7 All proposed land uses would include suitable provision of cycle parking / storage to encourage sustainable travel.

## A414 Bridge Crossing

- 5.6.8 A pedestrian and cycle bridge will be provided over the A414 to connect the southern neighbourhood with the employment area and link with onward connections to other parts of the Development. The bridge landing points will be located within the zones shown in the Access and Movement Parameter Plan. The southern ramp will be integrated into the planted bund and landscape area south of the A414 and connect onward to the STC and Valley Park pedestrian and cyclist links. The northern ramp will be designed in association with the southern commercial area and connect onward to its central public square, the primary mobility hub, and the STC.

## The Nickey Line, Quietways and Pedestrian, Cycle and Equestrian Routes

- 5.6.9 The Nickey Line would be improved through the Site for use by pedestrians and cyclists. A controlled at-grade crossing point across the STC would be provided for pedestrians and cyclists using the Nickey Line. An additional connection point will be provided south from the Nickey Line to the proposed Country Park to the east of the STC as shown on Access and Movement Parameter Plan. The existing connection between the Nickey Line and Cherry Tree Lane (which is to become a Quietway) will be maintained. The existing form of the Nickey Line (including vegetation) will be preserved where possible.
- 5.6.10 Sections of Hogg End Lane and Punchbowl Lane will become Quietways through the Site as shown on the Access and Movement Parameter Plan, whereby:
- Priority will be provided to pedestrians and cyclists; and
  - Vehicular access will be restricted to vehicles that require access to properties or for operational purposes (including emergency vehicles).
- 5.6.11 A network of pedestrian and cycle routes would be provided across the Development. Existing Public Rights of Way (PRoW) would be retained within the Development, however, there would be diversions where necessary and desirable to be integrated into the full active travel network. New equestrian routes will be provided within the Country Park / SANGs area in the northern neighbourhood and within the southern neighbourhood. Pegasus crossings will be provided at the B487 Hemel Hempstead Road (Redbourn Road) to facilitate safe crossing between Cherry Tree Lane and Holtsmere End Lane.

## Sustainable Transport Corridor (STC)

5.6.12 The Sustainable Transport Corridor (STC) would be the primary north-south route through the Site between the B487 Hemel Hempstead Road (Redbourn Road) in the north, the A414 Breakspear Way and the A4147 (Hemel Hempstead Road), providing connections to the development parcels. The STC would prioritise active travel movements along its length and bus priority at junctions. The STC would be supplemented by secondary and tertiary routes that would carry vehicles as well as other modes.

## Mobility Hubs

5.6.13 A series of Mobility Hubs will be provided within the development areas:

- A Primary Mobility Hub (Multi-Modal Interchange) will be provided within the southern commercial area on the STC, co-located with ancillary facilities provided for employees.
- A Secondary Mobility Hub will be provided in each of the two local centres.
- Tertiary Mobility Hubs will be located at intervals within the Development.

5.6.14 Secondary Mobility Hubs will be aligned with the location of new local centres and community cores. Bus routes will align with these hubs, offering interchanges between transport modes, such as bus to cycle and bus to walk. The majority of homes will be within 400m walking distance of a Mobility Hub or bus stop.

## 5.7 Green Infrastructure

5.7.1 The proposed green infrastructure and open space within the Development is shown on the Green Infrastructure Parameter Plan below (**Figure 5.6**).

5.7.2 Strategic and local open spaces would be provided throughout the Development to provide multi-functional and informal recreation, sustainable drainage, new planting, biodiversity areas, play, allotments and community food growing.

5.7.3 As shown on **Figure 5.6**, Suitable Alternative Natural Greenspace (SANG) would be delivered through a Country Park adjacent to the northern neighbourhood and south of the B487 Hemel Hempstead Road (Redbourn Road), and a Valley Park within the southern neighbourhood. SANG would be provided at 8ha per 1000 population. The Country Park will include Wood End Farm. SANG areas will include natural and semi-natural green space, play areas, walking routes including loop paths, a mosaic of habitats and local food production. Visitor car parking will be provided where the catchment of the SANG area exceed 400m walking distance, in line with Natural England guidance.

5.7.4 The Development would also provide:

- Incidental open spaces as part of the public realm;
- Formal parks in both the northern and southern neighbourhoods;

- Local play, including informal, formal and strategic play opportunities including equipped play;
- Trees and woodland areas which make use of existing and retained woodlands, trees and hedgerows outside of development zones;
- Green corridors to connect open spaces, safeguard existing vegetation, to provide active travel routes and to provide wildlife corridors;
- An earth bund with woodland planting adjacent to the M1 motorway to provide noise mitigation within the northern and southern neighbourhoods;
- Sports pitches, including one pitch at the southern neighbourhood and a sports hub within the northern neighbourhood.

5.7.5 As can be seen in **Figure 5.6**, the detailed edge treatment at the interface between built development and open space would be defined at later design stages and the Reserved Matters stage but would not extrude into the open space beyond the boundaries shown on the Parameter Plan.

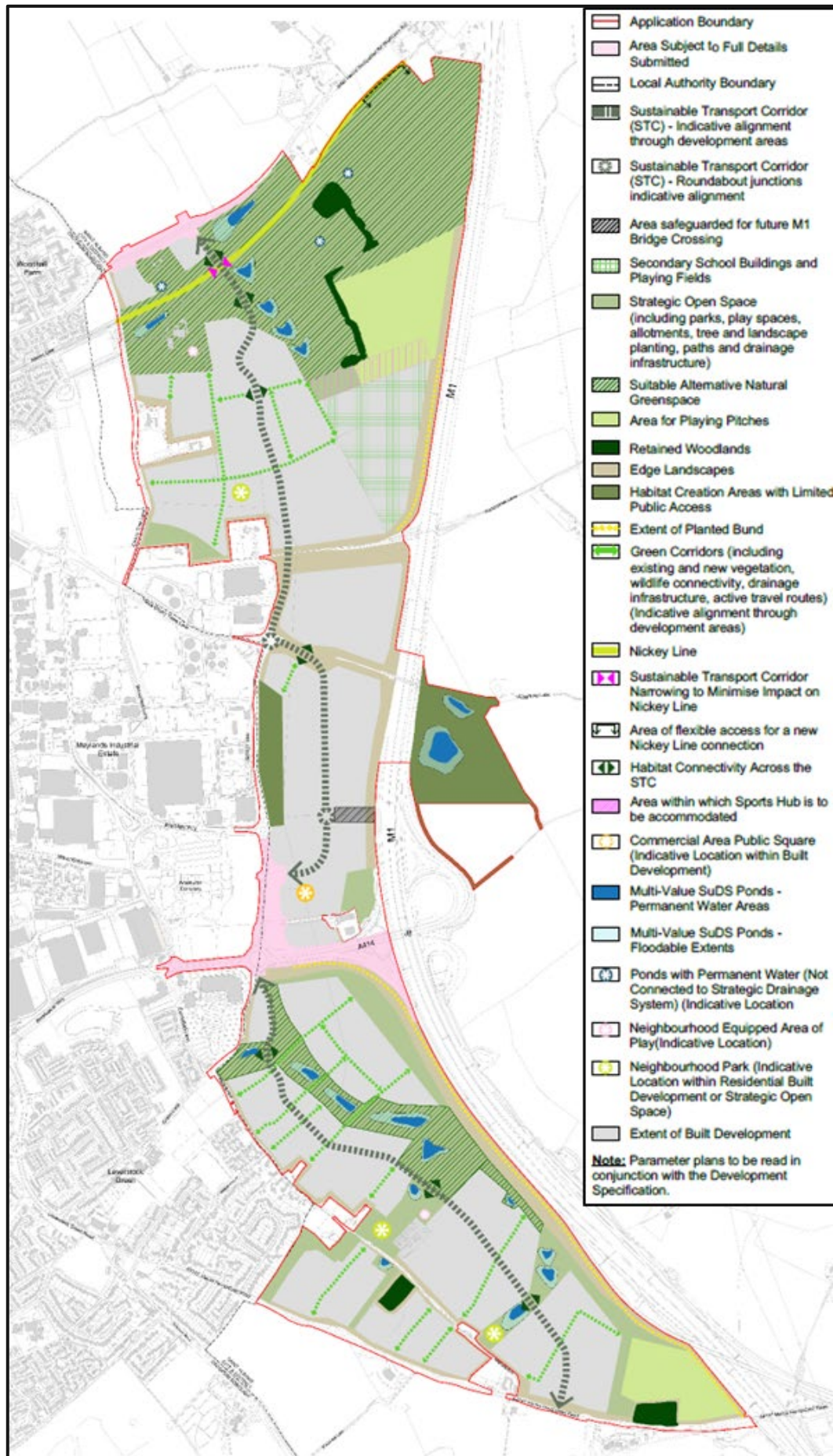
5.7.6 A planted woodland will be provided in the western boundary of the Commercial Area within the Buncefield Development Proximity Zone (DPZ), which will also provide screening against the Buncefield industrial edge. This will be managed for the benefit of nature conservation with limited public access, in line with the HSE advice and to contribute to site biodiversity net gain through the creation of habitats with limited disturbance from human activity.

## Sport and Play Provision

5.7.7 The Development would provide at least 0.6sqm of children's play space per person. There would also be the provision of a sports pitch in the southern neighbourhood and a sports hub within the northern neighbourhood.

5.7.8 Play space would be provided within the Development and all built development would be within 1000m of a Neighbourhood Equipped Area for Play (NEAP). Also, all built development would be within 400m of a Locally Equipped Area for Play (LEAP) or have access to natural play space offering informal play opportunities such as a Local Area for Play (LAP) within 100m of dwellings.

Figure 5.6: Green Infrastructure Parameter Plan



## 5.8 Surface Water Drainage Strategy

5.8.1 A Sustainable Drainage Strategy is provided in **ES Volume 3: Appendix 14.2: Sustainable Drainage Strategy**. Sustainable Urban Drainage Systems (SuDS) would be utilised throughout the Development with the detailed design of specific SuDS components are to be developed at the Reserved Matters stage. The surface water drainage would be designed for:

- No surface water flooding for all events to 1 in 30-year return period, in line with BS EN 752; and,
- No flooding of building and containment on Site for extreme events up to the 1 in 100-year period, in line with the NPPF.

5.8.2 As agreed with the Lead Local Flood Authority (LLFA), the proposed attenuation has been designed to discharge as per HCC LFRMS2 Policy 14[1]. This stipulates that *'for greenfield sites, the peak runoff rate from the development for the 1 in 1 year rainfall and the 1 in 100 year rainfall event must not exceed the peak greenfield runoff rate from the whole site for the same event. The runoff volume from the developed site in the 1 in 100 year, 6 hour rainfall event must not exceed the greenfield runoff volume for the same event.'*

5.8.3 There would be a number of SuDS attenuation ponds located throughout the Development as can be seen on **Figure 5.6: Green Infrastructure Parameter Plan**. There are six ponds located within EH North, two ponds located in the last to the east of the M1, within EH Central, and eleven ponds located in EH south.

5.8.4 All attenuated water would be discharged to the River Ver through the existing Thames Water sewers within the Site.

5.8.5 A sustainable water management system, as outlined in the Development Specification, will manage the site surface water run-off, the flood risk associated with existing overland flow routes and retain water, for use on site. The sustainable drainage system will include:

- Multi-function stormwater attenuation basins integrated in topography and landscape, including permanent water to achieve biodiversity and amenity value.
- Conveyancing of surface water via a network of open ditches, swales and rain gardens, including along streets where appropriate, to control run-off and diffuse urban pollutants at source before discharging to attenuation basins.
- The use of permeable surfaces and similar methods within the built areas to reduced run-off.
- The use of underground pipes when necessary, including the conveyance of surface water underneath the M1 motorway.

## 5.9 Lighting

5.9.1 The detailed Lighting Design would be developed at the Reserved Matters stage. However, for the purpose of the Outline Planning Application an External Lighting Strategy has been prepared (**ES Volume 3, Appendix 8.15**) which

identifies the existing baseline lighting conditions at the Site and sets design principles for the external lighting design which will help mitigate impacts of lighting on ecology receptors. The Lighting Strategy has used the illustrative masterplan to recommend appropriate lighting design solutions which would achieve the mitigation required for ecological receptors. This Strategy will be used to inform the development of detailed lighting designs at future reserved matters stages. The Lighting Strategy would enhance the after dark character of the Development and would be designed to provide sufficient light for safe access onto and around the Development by illuminating the road networks. The lighting scheme would be designed to minimise obtrusive light such as sky glow, glare, excessive visual brightness, light spill and light intrusion that may adversely impact sensitive ecology and residential receptors.

## 5.10 Utilities

### Electricity

5.10.1 400kV high voltage (HV) overhead cables bisect the northern part of the Site. These are network assets which are essential to the operation of the National Grid network. UKPN is the statutory provider of electricity for the Site. There are also several UKPN HV overhead lines bisecting the Site. Two primary substations near to the Site and are served by the overhead lines. The existing UKPN overhead HV and low voltage (LV) are proposed to be undergrounded and diverted to maintain the existing network and serve the Development. There are no proposed changes to the National Grid overhead cables.

### Gas

5.10.2 There are several existing gas mains in the vicinity of the Site. To the north, in Redbourn Road, there is an existing gas main which terminates outside the Sites boundary. There is a gas main, outside the Site, in Three Cherry Trees Lane which serves Punchbowl Park. There is also an existing gas main in Breakspear Way which terminates at edge of the Site boundary. There is only one known gas main in the southwestern part of the Site, parallel to Hemel Hempstead Road (A4147). It is not proposed to have any new gas connections for the Site as it has been proposed that the heating supply for the Development would be electric only.

### Buncefield Oil Terminal and BPA Pipelines

5.10.3 The Site is directly adjacent to the Buncefield Oil Terminal and bisected by multiple oil pipelines which come to and from the Terminal. There are three BPA pipelines groups which distribute petrochemical products across the UK. A single 10" pipe runs east to west adjacent to Hogg End Lane. This pipe has an approximate depth of 1.42m below surface level to crown and a 3.4m easement either side of the pipe. A single 10" pipe bisects the northern part of the Site running north to south, parallel to Cherry Tree Lane. This pipe is approximately 1.83m below surface to crown and has a 3.2m easement either side of the pipe. These pipelines are not proposed to be diverted.

## Potable Water

5.10.4 Affinity Water is the statutory undertaker for providing potable water to the Site. There are no existing potable water connections within the Site, aside from small diameter connections to existing buildings. There are existing potable water mains adjacent to the Site along the western boundary. Affinity Water do not expect a significant upgrade to their network based on the Accommodation Schedule. A single point of connection has been indicated to the south-west of the Site near Chambersbury Wood however, further discussions would be undertaken following determination of the Outline Planning Application to determine the best arrangement.

## Foul Sewerage

5.10.5 Thames Water is the statutory undertaker for foul drainage for the Site. There are no existing foul sewers within the Site given the existing agricultural use. There is an existing Thames Water foul sewer network to the west of the Site serving the neighbouring residential communities. The residential areas beyond the Site boundary near Redbourn Road / Hemel Hempstead Road / B587 in the north are served by a foul sewer network connecting to the Redbourn Road Hemel Hempstead Sewerage Pump Station (SPS) which is located north of the Nickey Line. The Development would require six pumping stations to serve the Development. One in the EH North, two in EH Central and three in EH South. Thames Water has confirmed there is insufficient capacity within the existing foul drainage network and strategic reinforcing would be required within the Development. Further confirmation would be undertaken following determination of the Outline Planning Application.

## 5.11 Energy Strategy and Climate Change Resilience

5.11.1 The Development would be fossil fuel free, utilising heat pumps to deliver low carbon heating, hot water and cooling. There would also be solar photovoltaics delivered across the Site to provide electricity. The Development provides an opportunity for a smart micro-grid by producing storing and using renewable energy on-Site.

5.11.2 The Development has various design measures to ensure resilience to climate change in the future. These include:

- Reduction of heat risk and secure overheating resilience through the landscape approach and development parcel layouts. Inclusion of tree canopies and soft verges create a cooling and shading effect within the Development.
- The Development has been designed to retain high value ecological assets and enhance low value ecological assets with 45% of the Development being open space.
- Water efficiency has been embedded into the landscape design.

## 5.12 Waste Management

5.12.1 An Operational Waste Management Plan (OWMP) has been developed to outline the recommended approaches to waste management across the Development and will be submitted alongside the planning application. Indicative amount of waste has been calculated based on the uses within the Development.

5.12.2 The Development is anticipated to generate 761,660 litres of residential waste each week, combined across EH North and South. For non-residential waste, an estimate of:

- 60,280 litres of waste are expected weekly in EH North;
- 896,500 litres of waste are expected weekly in EH Central; and
- 13,330 litres of waste are expected weekly in EH South.

5.12.3 A decentralised waste collection system would be used for EH North and EH South, with SADC undertaking residential waste collection. The different commercial uses and schools are assumed to establish their own waste management contract.