



Haverling

LONDON BOROUGH

CABINET MEETING
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HAVERING LOCAL PLAN
CONSULTATION STATEMENT 2017

Local Plan Consultation Statement Appendix 9

Additional Material Submitted

MARDYKE FARM

Havering Local Plan Representations
 Land at Mardyke Farm, South Hornchurch



Prepared by GVA
A Bilfinger Real Estate Company
On Behalf of Barratt London
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1. Introduction

- 1.1 This representation has been prepared by GVA on behalf of Barratt London in respect to the promotion of land at Mardyke Farm, South Hornchurch in the London Borough of Havering (LBH) (refer to site plan at Appendix A).
- 1.2 It is submitted in response to the current consultation on 'A new Local Plan for Havering' which seeks to identify the key strategic priorities for the Borough over the next 15 years and how these priorities should be addressed in the new Local Plan.
- 1.3 The purpose of this representation is to set out the case for a revision of the Green Belt boundary to exclude the Mardyke Farm site from the Green Belt alongside the provision of a strategic site specific policy that allocates the site for housing (and associated development) in the emerging plan. The site is deliverable (suitable, available and viable) in the short term and offers the opportunity to accommodate a high quality development of around 1,500 homes alongside a school, community facilities, and associated green infrastructure (including playing fields, parks, equipped children's play, and natural greenspaces).
- 1.4 The case focuses on setting out the exceptional circumstances necessary to justify a revision to the Green Belt boundary, which comprises the following:
- i) The following development needs exist:
 - There is a need to identify additional land for housing development in the borough in order to meet objectively assessed housing needs;
 - There is a need to provide new social infrastructure (including a school) and to support the upgrade of other infrastructure (including transport) in the local area;
 - There is a need for regeneration (physical, social, economic) of the local South Hornchurch/Beam Park area; and
 - There is a need to secure a sustainable long term future (including management arrangements) for the site.
 - ii) The site makes a limited contribution to the purposes of including land within the Green Belt, therefore its value in Green Belt policy terms is limited (the release of the site from Green Belt is therefore not likely to give rise to significant harm). Similarly, the site is considered to have only limited value in Green Infrastructure terms (any loss/harm can be appropriately mitigated).
 - iii) The site is deliverable, with development able to address each of the development needs set out above and therefore realise significant planning benefits in terms of housing, infrastructure and regeneration:

- It will be available for development from early 2017 (with delivery expected in the early part of the plan period);
- It is suitable for housing development in environmental, technical, townscape, and infrastructure capacity terms; and
- Development is a viable proposition, with a willing landowner and developer in place.

1.5 The representation is structured as follows:

- **Section 2** describes the site and its surrounding context as part of the South Hornchurch/Beam Park neighbourhood;
- **Section 3** summarises the site’s planning history;
- **Section 4** considers the strategic policy context that underpins the case for development;
- **Section 5** considers matters associated with its existing use;
- **Section 6** outlines the housing need case;
- **Section 7** assesses the harm of the proposal in Green Belt policy terms;
- **Section 8** demonstrates the site’s suitability for development and its deliverability;
- **Section 9** sets out the likely regeneration benefits of the proposal; and
- **Section 10** concludes the representation by summarising the planning case and framing the development opportunity.

1.6 This main report is supported by the following appendices:

- **Appendix A** – Site Plan;
- **Appendix B** – Approved/Committed Landscape Plan;
- **Appendix C** – Development ‘vision’;
- **Appendix D** – Transport and Access Appraisal;
- **Appendix E** – Technical/environmental Appraisal; and
- **Appendix F** – Green Belt Assessment/Methodology Framework.

2. Site and Surroundings

- 2.1 The site extends to approx. 37ha and is located on the western edge of the London Borough of Havering (LBH), approximately 15 miles (24km) east of Central London.
- 2.2 The site is bound by the Beam River to the west (which forms part of the Beam Valley Country Park); Dagenham Road (A1112) to the north; the rear of existing residential properties fronting Rainham Road / Betterton Road / Frederick Road to the northeast, east and south east; and the Orchard Village housing development (former Mardyke Estate) to the south west.
- 2.3 The site comprises 2 separate landholdings:
- i) 37 ha – A former aggregates and landfill site which is currently being restored following the cessation of operations. There are no permanent buildings/structures on the site. Currently the site is being restored; however public access is allowed in non-operational areas. This land is under single ownership (Ebbcliff Ltd).
 - ii) 4 ha – An area of public open space which includes an equipped children’s play facility. We understand that this land is under single ownership (London Borough of Havering).
- 2.4 The site is set within a suburban context typical of outer London which is characterised by low density 2-3 storey housing built in the inter-war and post-war periods, interspersed with more recent (and typically denser) development such as the Orchard Village scheme to the south west. These residential areas sit within a broader context that includes extensive areas of open space and industrial land (much of which is derelict).
- 2.5 Rainham District Centre which provides retail, services and community facilities is located approximately 1 km to the south east of the site. There are a number of educational establishments situated within close proximity to the site within the surrounding neighbourhoods, including: Newtons Primary School, The Leys Primary School, Britons Academy (Technology College), Whybridge Junior School and La Salette Catholic Primary School, all within 1km of the site.
- 2.6 The nearest London Underground Station is Dagenham East (District Line, Zone 5) located approximately 1km to the north-west of the site. National rail services are available from Dagenham Dock and Rainham (both Zone 6 and approximately 1.5km to the south-west and south-east respectively) providing C2C services to London Fenchurch Street in around 25 minutes. There are proposals for a new national rail station at Beam Park (approximately 1 km to the south). The site has a Public Transport Accessibility Level (PTAL) rating of 1-2.

3. Planning History

Existing Use

- 3.1 The site has been the subject of localised ad hoc sand and gravel (Drift Flood Plain gravels) extraction since at least the 1860's. Ordnance survey maps from the 1930's show the presence of commercial gravel extraction in the central northern part of the site which extended across the entire site by the late 1950's. The resultant void was in-filled with general undefined waste materials between 1961 – 1969.
- 3.2 Planning permission was granted in 1994 (ref. 0186.93) and an Environment Agency waste management license issued to allow the site to be restored. The approved scheme involves extensive ground level raising (and re-contouring) with inert materials, which is to be seeded (grass) and supplemented with some limited tree planting. The scheme also includes the provision of an 'ecological corridor' that follows a surface watercourse along the eastern boundary. A copy of the approved Landscaping Plan is enclosed at Appendix B.
- 3.3 Conditions attached to the planning consent were amended in 2010 (ref. 0432.10) and again in 2014 (0455.14). The final phase of the site's restoration commenced in April 2011 and is due to be completed in 2017.
- 3.4 The s.106 legal agreement associated with the planning consent (as amended) requires public access to 75% of the site following the completion of restoration works (15% is to be reserved for nature conservation with limited public access and 10% with no public access).
- 3.5 The future management and maintenance of the site is limited to a 10 year aftercare obligation linked with the associated legal agreement.

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- 3.6 The site was subject to a proposed allocation in the LBH Site Specific Allocations DPD (Submission Draft) (2008), for comprehensive redevelopment (housing/public open space) including the removal of part of the site from Green Belt. The proposed allocation was removed by the Inspector appointed to examine the plan on the grounds that the benefits of allowing development to proceed were not considered to constitute the exceptional circumstances required to justify a review of the Green Belt. The decision was based upon the Inspector's conclusion that the borough had identified a sufficient supply of deliverable sites to meet housing needs/targets without having to rely on this site and consequently there was no 'need' argument to justify its release from Green Belt.

- 3.7 We note that historic housing delivery rates in the borough in the period since the Inspector’s decision have consistently fallen short of London Plan annual monitoring targets. This confirms that the supply of sites carried forward in the adopted Local Plan were not sufficiently ‘deliverable’ to meet housing needs in full and therefore a need case to underpin the allocation of the Mardyke Farm site did in fact exist (contrary to the Inspector’s decision at the time).

4. Strategic Policy Context

- 4.1 The starting point for determining the case for development at the site is the extant framework of national and London-wide planning policies, with which the new local plan should be in general accordance. We set out below an overview of the key pertinent policy considerations of relevance to the site (which we consider to be focussed on housing, Green Belt, and public open space matters).

National Planning Policy Framework

- 4.2 The National Planning Policy Framework sets out the Governments planning policies for England and how these are expected to be applied. It provides a framework to within which local people and their accountable councils can produce their own distinctive local plans, which reflect the needs and priorities of their communities. The NPPF must therefore be taken into account in the preparation of local plans and is a material consideration in planning decisions.
- 4.3 The NPPF establishes a firmly positive ‘pro-development’ national policy position, which is underpinned by a ‘presumption in favour of sustainable development’. The Government has made it clear that the NPPF and its aforementioned presumption represent a significant step-change in national policy (which, notably, has come into force since the current Havering Local Plan was adopted).
- 4.4 The NPPF aims to proactively drive and support sustainable economic development to deliver the homes and infrastructure that the country needs. The framework states that every effort should be made to objectively identify and then meet the development needs of an area and respond positively to wider opportunities for growth. It continues that emerging plans should take account of market signals, such as land prices and housing affordability, and set out a clear strategy for allocating sufficient land which is suitable for development in their area, taking account of the needs of the residential and business communities. In order to achieve this goal, the NPPF encourages the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental quality (paragraph 17).

Housing

- 4.5 A key objective of the NPPF is ‘to boost significantly the supply of housing’ (paragraph 47). In order to achieve this, Local Planning Authorities should “*Identify and update annually a supply of specific deliverable sites sufficient to provide five years’ worth of housing against their housing requirements with an additional buffer of 5% (moved forward from later in the plan period) to ensure choice and competition in the market*”

for land. Where there has been a record of persistent under delivery of housing, local planning authorities should increase the buffer to 20% (moved forward from later in the plan period) to provide a realistic prospect of achieving the planned supply and to ensure choice and competition in the market for land".

- 4.6 As will be explained in Section 5 of this report, LBH does not have an up-to-date 5 year supply of housing land. The Council currently has a 4.04 year supply of housing land (against adopted FALP 2015 targets) and as such, falls short of the requirements set out in the NPPF.

Green Belt

- 4.7 With regards to the Green Belt, the NPPF seeks continued protection of Green Belts (paragraph 17) and states that *'the fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open'* (paragraph 79). It continues to identify openness and permanence as essential characteristics of the Green Belt.
- 4.8 Paragraph 80 of the NPPF highlights that the Green Belt serves the following five purposes:
- i) To check the unrestricted sprawl of large-built up areas;
 - ii) To prevent neighbouring towns from merging into one another;
 - iii) To assist in safeguarding the countryside from encroachment;
 - iv) To preserve the setting and special character of historic towns; and
 - v) To assist in urban regeneration, by encouraging the recycling of derelict and other urban land.
- 4.9 The NPPF states that Green Belt boundaries should only be altered in exceptional circumstances, through the preparation of the Local Plan. At such time, authorities should consider Green Belt boundaries having regard to their intended permanence in the long term, so that they should be capable of enduring beyond the plan period (paragraph 83). The implication of this criteria being that where significant development pressure exists and exceptional circumstances are warranted to develop in the Green Belt, it is considered appropriate for local planning authorities to seek to remove such sites from the Green Belt through the Local Plan-making process in order that they can deliver sustainable development to meet their identified development needs.
- 4.10 The NPPF continues that when drawing up or reviewing Green Belt boundaries, local planning authorities should take account of the need to promote sustainable patterns of development (paragraph 84). Sustainable patterns of development are not defined in policy. However, this is considered to relate to taking into account a range of additional factors beyond the contribution towards Green Belt purposes. These

factors might include local development needs, transport issues and accessibility to local services and public open space. With regard to sustainability, it is necessary to recognise the wider and updated context of how sustainable development is defined in the NPPF as set out above. Updated policy states it should contribute towards social, economic and environmental objectives.

- 4.11 The NPPF reaffirms the definition of Green Belt boundaries, stating (paragraph 85) that when defining boundaries, local planning authorities should:
- Ensure consistency with the Local Plan strategy for meeting identified requirements for sustainable development;
 - Not include land which it is unnecessary to keep permanently open;
 - Where necessary, identify in their plans areas of ‘safeguarded land’ between the urban area and the Green Belt, in order to meet longer-term development needs stretching well beyond the plan period;
 - Make clear that the safeguarded land is not allocated for development at the present time;
 - Satisfy themselves that Green Belt boundaries will not need to be altered at the end of the development plan period; and
 - Define boundaries clearly, using physical features that are readily recognisable and likely to be permanent.
- 4.12 In summary, the NPPF supports the long-standing principles of Green Belt protection, whilst acknowledging that the objectives of the planning system continue to evolve, reflecting current land use pressures and social trends. The Government’s priority is to deliver growth and sustainable development through harmonising, wherever and whenever possible, the economic, environmental and social processes that deliver functioning places. Policy also reinforces the plan-led system which gives planning authorities the power to undertake Green Belt reviews to help inform emerging spatial strategies for Local Plans necessary in order to meet development needs. The role and function of the Green Belt therefore needs to be considered within this overarching context to assist in the delivery of sustainable development.

Public Open Space

- 4.13 There is a commitment under the extant planning consent for the site to revert to publicly accessible land following the completion of the restoration scheme (the future ‘baseline’ position), therefore policies relating to public open space and green infrastructure are relevant.
- 4.14 In this regard, the NPPF places a requirement on local authorities to set out a strategic approach in their Local Plans that plans positively for the creation, protection, enhancement and management of networks of green infrastructure.

London Plan

- 4.15 The Further Alterations to the London Plan (FALP) was adopted on 10th March 2015 and provides the overall strategic plan for London for the period to 2031. The policies of the FALP are now operative as formal alterations to the London Plan and therefore for part of the Development Plan for Greater London.

Housing

- 4.16 The Plan places significant policy priority on increasing the supply of new housing in London, and recognises that the capital is part of a global and national housing market as well as having its own, more local and acute housing market needs which places a unique challenge in reducing the gap between need and supply.
- 4.17 The former London Plan set an annual monitoring target of 32,000 net additional homes in London (Policy 3.3). However this target has been subject to a significant upward revision in the adopted FALP largely on account of revised population projections for London which suggest that London's population is likely to increase significantly more than was anticipated in the past (an increase of 2 million people in the period to 2036).
- 4.18 The FALP is based on an accepted 'need' to provide a minimum 49,000 net additional homes per annum in London in the period 2015-36 (with recognition that the need in the early part of the plan period is likely to be greater than this). It makes clear at paragraph 3.18 that for Local Plans to be found sound they must demonstrate that they have sought to boost significantly the supply of housing as far as is consistent with the policies of the NPPF, with particular emphasis placed on demonstrating deliverability.
- 4.19 Paragraph 3.19i establishes two requirements for boroughs to satisfy through their local plans:
- i. Meet the relevant minimum housing supply target defined in Table 3.1. For Havering, this is 11,701 for the period 2015-25 (an annual monitoring target of 1,170); and
 - ii. Noting that the defined borough targets fall short of the 49,000 objectively assessed annual housing need figure, boroughs are also required to seek to exceed the target by identifying additional sources of supply.
- 4.20 The FALP housing target for Havering is an increase from 9,700 in the adopted 2011 London Plan.

Green Belt

- 4.21 The London Plan's policy position in respect to Green Belt is as per the NPPF (Policy 7.16).

Public Open Space

- 4.22 The site is not designated as Metropolitan Open Land, Local Green Space, or any other local open space designation in the Local Plan and therefore is not subject to protection under London Plan policies. Notwithstanding this, paragraph 7.58 requires that the value of such non-designated spaces should be considered as a material consideration that should be taken into account in the planning process, with Policy 2.18 setting out the strategic approach to Green Infrastructure across London.
- 4.23 Policy 2.18 places the onus on local authorities to plan strategically and positively for the creation, protection, enhancement and management of networks of green infrastructure through the production of a Green Infrastructure Strategy.

Conclusions – Implications for the New Local Plan

- The plan should identify (allocate) a supply of specific developable sites (or broad locations for growth) to accommodate a minimum 17,550 net additional homes (1,170 annual monitoring target over the 15-year period of the plan), and identify measures to exceed this minimum requirement. The preference is for development to be directed to brownfield land;
- In preparing the plan, the LPA should consider revising Green Belt boundaries in the context of achieving sustainable development (including the aim of significantly boosting the supply of housing) and the exceptional circumstances test; and
- The plan should include a Green Infrastructure strategy.

5. Existing Use

Aggregates/Waste Use

- 5.1 The site is not subject to any existing protective policy designations relating to minerals/waste in the current Local Plan. The site has fulfilled its functional life as an aggregates extraction and waste resource, and the completion of the site's restoration works will in effect mark the commencement of a new chapter in its planning history.

Green Infrastructure

- 5.2 The planning permission and S106 Legal Agreement dated 1993 (and updated in 2011 and 2014 respectively) requires general public access to be provided to 75% of the site following the completion of restoration works (with 15% reserved for nature conservation with limited public access and 10% with no public right of way). This is effectively the future 'baseline' position in terms of the site's use.
- 5.3 It is appropriate to reconsider whether this 'future baseline' use of the site is the most appropriate solution. The relevant considerations include the quality and type of provision; management arrangements; and whether there is a need for that type of space.

Quality of Provision

- 5.4 The approved landscaping scheme includes no 'formal' landscaping or recreation provision. Instead the majority of the site is to be simply seeded with grass, alongside some limited tree planting and protection of an 'ecological corridor' along the eastern boundary. Effectively it will mature into a 'natural greenspace' type of provision in Green Infrastructure (GI) terms.
- 5.5 The value of this space in GI terms should be considered in the context of other existing provision in the local area and associated needs (as considered below).

Future Management

- 5.6 The future management and maintenance of the site will be in accordance with the 10 year aftercare plan as required by the approved legal agreement.

Green Infrastructure Need

- 5.7 LBH undertook an assessment of open space provision in the borough as part of its evidence base to inform the 2008 Core Strategy. It is assumed that an up to date

assessment will be undertaken as part of the preparation of the new local plan, nonetheless at this point in time this remains the most up to date evidence base for GI matters.

- 5.8 The assessment identifies the site as is located within the ‘South Hornchurch’ ward which accommodates 12.98ha of open space, including, linear parks/open space, metropolitan parks, district parks, local parks, small local parks/open spaces and pocket parks. We note that this excludes the 74ha Beam Valley Country Park which is adjacent to the site (but falls within an adjacent ward). It also excludes the site (as committed future GI provision).
- 5.9 South Hornchurch is identified as where a significant proportion of homes are deficient in access to Local Parks and District Parks (having regard to the category hierarchy, and size/distance from homes guidelines set out in Table 7.2 of the London Plan). All of the borough’s wards are within the 3.2km catchment area of at least one metropolitan park.
- 5.10 The study includes a qualitative and quantitative assessment of existing provision. In qualitative terms, the study concludes that GI provision in South Hornchurch ward is ‘below average quality and value’. The quantitative assessment compares actual provision of numerous GI typologies against defined policy standards – Table 1 below summarises the position for South Hornchurch ward:

Table 1: Open Space Provision in South Hornchurch Ward Compared Against Policy Benchmark Standards (2005 Study)

Ward	Public Parks	Natural Greenspace	Playing Pitches	Allotments	Amenity Space Need
South Hornchurch	-0.81ha	+10.88ha	+0.74ha	+0.03	Low

- 5.11 As is evident from the table above, the study indicates that in quantitative terms there is an ‘over-supply’ of access to natural greenspace in the ward, however an under-supply of parks. This is compounded by the qualitative deficiencies outlined above. This suggests that there is limited value in providing additional natural greenspace on the Mardyke Farm site.

Conclusions – Implications for the New Local Plan

- The current restoration works will cease in April 2017.
- The future committed use as publicly accessible natural greenspace is the more relevant consideration. Existing evidence indicates that there is no need for additional natural greenspace in the local area, therefore non-provision would

not result in a significant harm in GI policy terms. Notwithstanding this, there is a pressing need for more formal public parks and qualitative improvements to existing provision across all GI typologies, which the Mardyke Farm site could effectively help satisfy.

- The new Local Plan should be informed by an up to date GI assessment and include a GI strategy.

6. Housing Matters

- 6.1 The relevant housing considerations for plan-making focus on objectively assessed need and land supply.

Need

- 6.2 The borough's objectively assessed need has been assessed at a strategic level in the London Strategic Housing Market Assessment (SHMA) and is defined in the FALP. As per Section 4, the new local plan is required to make provision for a minimum 17,550 net additional dwellings (with an expectation that this should be exceeded) (15 years x 1,170 per annum target).

Supply

- 6.3 The relevant supply side considerations are the London Strategic Housing Land Availability Assessment (SHLAA), historic delivery rates, and the Council's identified supply of deliverable housing land.

SHLAA

- 6.4 The London SHLAA was prepared in 2013 to inform the FALP. It identifies a supply of land within LBH with capacity to accommodate 11,700 net additional homes in the period 2015-25 (which is consistent with the minimum FALP housing target for 2015-25). Headline details are set out in the table below:

Table 2: LBH SHLAA Summary (LBH) (for the period 2015-25)

Overall Capacity (2015-25)	Large Site Capacity Timescales/Phasing (2015-25)	Large Site Capacity by Source (2015-25)	Longer Term Large Site Capacity (2025-35)
Large Sites: 9,936 units Small Sites: 1,505 units Vacant units: 260 units Total: 11,701	Phase 2 (2015-20): 4,765 units Phase 3 (2020-25): 5,171 units Total: 9,936 units	Allocation: 3,524 units Approval: 2,311 units Low probability: 345 units Potential: 3,756 units Total: 9,936 units	Phase 4 (2025-30): 1,212 units Phase 5 (2030-36): 1,183 units

- 6.5 As is demonstrated by Table 2, above, the SHLAA indicates that the borough is heavily dependent on large sites to meet its FALP targets. Identified large sites comprise a combination of allocations, approvals and 'potential' (the content of this source of supply is kept confidential by the GLA). We are aware that a number of the allocated and consented sites are subject to delivery constraints (including viability, site

availability, and technical issues) which may delay the delivery phasing anticipated in the table above and create a challenge for the LPA in meeting its housing targets particularly in the early part of the new local plan period.

Historic Delivery Rates

- 6.6 In considering the deliverability of identified land supply, it is appropriate to consider historic delivery trends.
- 6.7 The LBH Annual Monitoring Report (AMR) (2012-13) sets out the most up to date published details in respect to the borough's historic delivery rates (noting that 2012/13 data is somewhat out of date), as summarised in Tables 3 below. This confirms a consistent trend of under-delivery of new housing in LBH when assessed against London Plan requirements which reinforces the challenge that the borough is likely to face in meeting FALP targets in the early part of the plan period in particular.

Table 3: LBH Historic Housing Delivery Rates (LBH)

	London Plan Target	Completions	Balance
2008/09	535	628	+93
2009/10	535	420	-115
2010/11	535	263	-272
2011/12	970	407	-563
2012/13	970	396	-574
5-Year Total	3,545	2,114 (average 423/annum)	-1,431 (average -286/annum)

5-Year Housing Land Position

- 6.8 LBH's defined 5-year housing land supply provides a finer-grain position on deliverable short term land supply. The most recent data is published in the borough's 2012-13 AMR (which we recognise is now dated) and summarised in Table 4, below:

Table 4: 5-Year Housing Land Position (LBH)

	5-year Annual Monitoring Target	+20% Buffer (on account of persistent under-delivery)	Total Requirement	Identified Supply	Balance
London Plan (2011)	4,850 units (970/annum)	+970 units	5,820 units	5,676 units	-144 units
Proposed Further Alterations to London Plan	5,850 units (1,170/annum)	+1,170 units	7,020 units	5,676 units	-1,344 units

6.9 The above table indicates that the borough has an equivalent 5 year housing land supply position of 4.88 years and 4.04 years supply against adopted and emerging London Plan housing targets when taking into account a 20% buffer as required by the NPPF where there is a record of persistent under-delivery as is the case in LBH. As noted above, we note that a number of sites identified as part of the supply of 'deliverable' sites for the next 5-years comprise stalled consented schemes which indicates that much of the identified supply may be subject to deliverability constraints (this includes sites allocated in the Site Allocations DPD). This includes the examples set out in the table below:

Table 5: Examples of Stalled Schemes in LBH

Location	Application Reference	Status	Approved Units
Angel Way Retail Park	P2246.07	Not started	350
Mardyke Estate Phase 3	P0959.12	Not started	124
Dovers Corner	U.00002.08	Not started	746
Roneo Corner	P1918.11	Not started	141
Total Stalled Units			1,361

Conclusions – Implications for the New Local Plan

- The new local plan should identify (allocate) a supply of specific developable sites (or broad locations for growth) to accommodate a minimum 17,550 net additional homes (1,170 annual monitoring target over the 15-year period of the plan), and identify measures to exceed this minimum target;
- The London SHLAA identifies a land supply to meet this need for the first 10 years of the plan, however interrogation of this evidence suggests that much of this identified supply is subject to delivery constraints (this is particularly applicable to sites earmarked to come forward in the period 2015-20). It will be necessary to

thoroughly test the deliverability of identified supply as part of the plan preparation process, and to identify an additional supply of deliverable sites if there is not a reasonable prospect of overcoming these delivery constraints (which we anticipate will be the case);

- The London SHLAA does not identify a sufficient supply of land to meet housing needs in the latter part of the plan (2025 onwards). An additional supply of land will need to be identified to meet these needs (while the FALP targets only cover the period 2015-25, the new Local Plan is required to roll these forward for the full term of the plan period); and
- It will be necessary to identify a further supply of land in order to exceed the minimum targets set out in the FALP.

7. Green Belt Considerations

- 7.1 The key planning policy constraint against the redevelopment of this site is its Green Belt designation. The Green Belt designation carries significant weight as a material consideration in planning policy and development management. Government policy is explicit that changes to Green Belt designations should be made through the Local plan process, in the context of promoting sustainable development as set out in the NPPF.
- 7.2 It is our view that exceptional circumstances exist to warrant the release of this site from the Green Belt. The main purpose of this section is to set out an assessment of the value of the site in Green Belt terms in order that the ‘harm’ of its loss can be appropriately considered. The assessment criteria relates to the five national Green Belt purposes as set out in the NPPF:
- i) To check the unrestricted sprawl of large built-up areas;
 - ii) To prevent neighbouring towns from merging into one another;
 - iii) To assist in safeguarding the countryside from encroachment;
 - iv) To preserve the setting and special character of historic towns; and
 - v) To assist in urban regeneration, by encouraging the recycling of derelict and other urban land.
- 7.3 The assessment is based upon the application of a Green Belt assessment ‘framework’ which is enclosed at Appendix F.

(i) To check the unrestricted sprawl of large built-up areas

- 7.4 The original purpose of the Green Belt was to restrict the outward expansion of Greater London, which represents the ‘large built-up area’ of interest to this assessment. Consistent with best practice, the assessment of Mardyke Farm against this first purpose of including land within the Green Belt focuses on the strategic level, with ‘Purpose 2’ providing a more local context.
- 7.5 The site is located within the extent of Greater London and is encircled by associated built development in all directions. The development of this site would not result in the outward expansion of the large built-up area of Greater London and accordingly, the site cannot be reasonably considered to provide an effective barrier against outward sprawl, instead representing concentration of development within the Capital’s existing built limits.
- 7.6 As such, the site cannot be considered to contribute to a wider Green Belt network that provides a strategic barrier against London’s outward sprawl, and is therefore considered to provide limited or no contribution to the first Green Belt purpose.

(ii) To prevent neighbouring towns from merging

- 7.7 The site forms part of the outer eastern suburbs of Greater London which comprises a web of overlapping neighbourhoods without distinctive boundaries.
- 7.8 The site is bordered on three sides by existing (mainly) residential development which is considered to be 'typical' in terms of its suburban character (no notable different or unique characteristics to define any of the adjacent neighbourhoods/townscapes from the wider suburban context). While the names of these adjacent neighbourhoods change, in practice it is our view that the site comprises an area of non-residential land that sits within a single sprawling suburb (or 'place').
- 7.9 On this basis, the site is not capable of acting as a gap (or break) between 2 or more definable towns/places and therefore is not capable of having a meaningful contribution to the Green Belt objective of preventing neighbouring towns from merging.

(iii) To assist in safeguarding the countryside from encroachment

- 7.10 The 'countryside' can be defined as open land with an absence of built development and urbanising influences, and characterised by rural land uses including agriculture and forestry. Consideration of relevant landscape character or quality designations should also be taken into account in assessing the role of the Green Belt in safeguarding countryside in accordance with a 'functional' view of the countryside.
- 7.11 The site is not considered to fall within the definition of a 'countryside' location as set out above. The site does not display any rural/countryside characteristics and comprises a former aggregates site with associated industrial / urbanising features within the existing built suburban extent of Greater London. The A1112 is also a major urban influence which is audibly intrusive. Furthermore, the site forms part of a network of safeguarded mineral sites as opposed to typical agricultural land uses which defines the Green Belt uses to the east of the borough and also marks the easternmost extent of London's built form.
- 7.12 Environmental designations are important in relation to the third Green Belt purpose as aspects of biodiversity, forestry and wildlife conservation can be viewed as constituent ingredients of the 'countryside'. There are no statutory environmental designations that affect the site, the nearest being the Ingrebourne Marshes SSSI located approximately 1.5km to the east of the site.
- 7.13 The landscape character and quality of the site is considered to be poor as reflected by the absence of any landscape designation. The current restoration works associated with the former site operations are considered to detract significantly from

the landscape / aesthetic quality of the adjacent Country Park. However, it is recognised that the landowner is committed to a scheme of landscaping works which will improve this 'baseline' position in the future.

- 7.14 Overall, it is considered that the site cannot reasonably be considered to constitute a countryside location by virtue of its former aggregate / landfill uses and associated urbanising features and surrounding suburban context. It is therefore considered that the release of this site for development would not constitute an encroachment into the countryside which might otherwise harm the objectives of including this site within the Green Belt.
- 7.15 Accordingly, the site is not capable of contributing to third purpose of the Green Belts.
- 7.16 Furthermore, it is considered that the release of this site for development would in fact assist LBH to safeguard the countryside by directing new development to address identified needs towards previously developed sites within an established suburban context. Such principles are promoted by the NPPF which seek to encourage the effective reuse of previously developed (brownfield) land to help to promote the vitality of urban areas and conserve the intrinsic character and beauty of the countryside.

(iv) To preserve the setting and special character of historic towns

- 7.17 This purpose of the Green Belt is to perform a 'girdle' role, as a green ring around historic settlements and/or to provide the landscape context to historic features that preserves historic setting by keeping land open.
- 7.18 A review of the local area confirms few historic assets of interest within the vicinity of the site with no historic towns, conservation areas, scheduled monuments or historic parks and gardens identified as applicable to this assessment. Two Grade II Listed Buildings have been identified within the vicinity of the site, notably: Stoneford Cottage within the built up Dagenham area to the west of the Beam River Country Park (which therefore does not share any inter-visibility with or relate to the site); and the old Essex Water Sub-Station located to the north of the site on the opposite side of the A1112 which relates directly to the Weir overflow reservoir to the north.
- 7.19 Accordingly, it is considered reasonable to conclude that the site does not contribute towards the preservation of the setting and special character of historic towns nor any other heritage assets. Consequently, the site is not capable of contributing to the fourth purpose of the Green Belt.

(v) To assist in urban regeneration, by encouraging the recycling of derelict and other urban land

- 7.20 The objective of this purpose is to constrain the supply of development land in order to encourage the recycling of previously developed sites which would not otherwise be developed, and therefore assist with urban regeneration. This objective can only be realised if there is a supply of derelict and other urban land that is capable of being recycled and which is deliverable.
- 7.21 It is our view that in the long term, constraining development on this site is likely to encourage the recycling of derelict land elsewhere (due to market forces). However, as discussed in the previous section, much of the supply of derelict land in the borough is subject to significant delivery constraints and therefore in practice is unlikely to come forward in the short term (whether or not this site is removed from the Green Belt). On balance, we consider the site to make a contribution to this Green Belt purpose but in practice the value (or significance) of this contribution is limited.
- 7.22 Conversely, Section 9 of this representation makes the case that the release of this site from Green Belt would, in fact, be expected to support the regeneration of the surrounding area which would neutralise the potential policy harm in respect to this purpose.
- 7.23 The above should be considered in the context that the site itself comprises previously developed land which offers the opportunity for recycling.

Summary

- 7.24 The NPPF confirms that the fundamental aim of the Green Belt is to keep land permanently open as a means of achieving 5 key purposes. The contribution of the Mardyke to these purposes is limited, as summarised in Table 6 below:

Table 6: LBH Historic Housing Delivery Rates (LBH)

Green Belt Purpose	Assessed Contribution of the Mardyke Farm Site to the Purpose
(i) To check the unrestricted sprawl of large built-up areas	Limited or no contribution
(ii) To prevent neighbouring towns from merging	Limited or no contribution
(iii) To assist in safeguarding the countryside from encroachment	Limited or no contribution
(iv) To preserve the setting and special character of historic towns	Limited or no contribution
(v) To assist in urban regeneration, by encouraging the recycling of derelict and other urban land.	Partial contribution

Conclusions – Implications for the New Local Plan

- In preparing the new local plan, the LPA should consider revising Green Belt boundaries in the context of achieving sustainable development (including the aim of significantly boosting the supply of housing) and the exceptional circumstances test; and
- It is considered that the Mardyke Farm site makes a limited contribution to the purposes of including land within Green Belt, and that this limited contribution (assist in urban regeneration) could be more effectively achieved through the development of the site. As a consequence, the site has limited 'value' in Green Belt terms and therefore the removal of this site from the Green Belt would not give rise to significant 'harm' in Green Belt policy terms.

8. Deliverability

- 8.1 Critical to the case for development at the site is demonstrating deliverability in order to confirm that it is capable of meeting the development needs.

Site Suitability

Landscape/Townscape

- 8.2 An appraisal of the site's landscape and townscape setting has been undertaken to inform the 'Development Vision' (enclosed at Appendix C) which concludes that the site has limited landscape value and the approved landscaping scheme for the site offers minimal improvements. Furthermore, the surrounding townscape setting is not considered to be particularly sensitive to change.
- 8.3 Accordingly, the supporting appraisal demonstrates there are no insurmountable constraints to development at this site and the site presents the opportunity to deliver an exemplar scheme to the benefit of the local area.

Access and Transport

- 8.4 The site benefits from existing access onto the public highway (Rainham Road South/Dagenham Road) plus pedestrian connectivity to the south and west, and is an existing generator of a significant number of HGV movements.
- 8.5 The Transport and Access Appraisal (enclosed at Appendix D) confirms that satisfactory access to the site can be achieved to support the envisaged redevelopment, and that there are no insurmountable highway infrastructure capacity constraints to development. The appraisal indicates that there is a significant opportunity to meet the transport needs of future development at the site via sustainable modes through appropriate investment in walking, cycling and public transport infrastructure in line with area-wide strategic transport infrastructure plans.

Technical/Environmental

Flood Risk

- 8.6 A small proportion of the site falls within Environment Agency Flood Zone 3 where development would be subject to strict controls on flood risk terms. However, the majority of the site falls within flood risk Zone 1 and therefore is suitable in principle for residential development in flood risk terms. Any future planning application would need to be supported by a site specific flood risk assessment and surface water drainage strategy (incorporating SUDS).

Geo-environmental

- 8.7 The appended Geo-Environmental Appraisal (Appendix E) confirms the site to be readily available for redevelopment without the need for further remediation. The final phase of site restoration is scheduled for completion in 2017. Moreover, the deep thickness of restoration grade soils at the site will allow the site profile to be changed if required without implications on human health associated with ground gas or impacted groundwater.
- 8.8 The site therefore represents a 'blank canvas' ready for redevelopment.

Ecology

- 8.9 The appended Ecology Appraisal (Appendix E) confirms there are no overriding ecological constraints at the site to restrict future residential development.
- 8.10 The appraisal highlights the significant opportunities presented by the proposed redevelopment of the site to deliver enhanced wildlife habitats and ecological corridors to improve the function of the site as part of a wider ecological network.

Heritage Assets

- 8.11 The site is not designated as a Conservation Area, does not contain any listed buildings, and does not form part of the setting of any heritage assets. Accordingly the site is not constrained by any heritage assets

Social Infrastructure

- 8.12 We are aware that social infrastructure provision in the local area is under stress, particularly in respect to school provision which will be compounded by residential development on the site. This issue can be dealt with by increasing local provision, including on-site provision of a school.
- 8.13 To help inform the second stage in determining whether the site is suitable for residential development, a number of supporting studies have been commissioned to consider the environmental and technical constraints and opportunities presented by this site. These supporting studies are appended to this representation and the key messages drawn out and summarised below.

Utilities

- 8.14 We are aware that utilities infrastructure provision in the local area is under stress. This issue can be dealt with by increasing capacity.

Site Availability

- 8.15 The current restoration scheme is expected to be completed in early 2017 at which point the existing use will cease and the site will be available for development.
- 8.16 The future function of the site is limited to the obligations associated with the approved S106 agreement as set out above. This will require varying following established standard procedures as part of future planning application negotiations.
- 8.17 The majority of the site is under a single private sector ownership, with the balance owned by the local authority. The majority owner is willing to make the site available for development and has entered into an option agreement with a housebuilder to promote the site. The Council (as owner of the balance of the site) is able to make its land available.

Viability

- 8.18 The landowner and developer have confirmed that residential development on the site is a viable proposition.

Conclusions – Implications for the New Local Plan

- The site is suitable for housing development with no insurmountable environmental or technical constraints;
- The site is available for development from early 2017;
- There is a willing landowner and developer agreement in place, who are keen to progress housing development at the earliest opportunity;
- Housing development is viable; and
- Accordingly, for the purposes of preparing the Local Plan, the Mardyke Farm site should be treated as a deliverable source of housing land with an expectation of completions being achievable in the early part of the plan period.

9. Regeneration Benefits

- 9.1 There is a recognised need for regeneration in the local Beam Park/South Hornchurch area largely in response to legacy issues associated with its industrial past. Redevelopment of the site for housing (and associated use) offers the opportunity to address this, and deliver significant regeneration benefits for the local area, as discussed below:

Local Market Conditions

- 9.2 Much of this area of East London is identified for positive change, including the nearby Rainham West Site Allocation and Riverside Opportunity Area beyond. However, despite a buoyant housing market across London as a whole, local market conditions remain challenging with key housing sites struggling to get off the ground due to viability constraints (typically caused by high site preparation costs, infrastructure costs, and low end values). Accordingly, despite notable investments, the considerable development opportunities presented by these key housing sites and other regeneration initiatives in this area of London have not yet been fully realised by either the public or the private sector.
- 9.3 However, development at the Mardyke Farm site is not subject to the same viability challenges that constrain many other local site opportunities. Housing development here is viable and the landowner's selected developer is committed to bringing it forward at the earliest opportunity. This will involve a significant capital injection into the local area which will represent a clear/demonstrable statement of confidence in the local market from one of the UK's largest housebuilders. We would expect this to reduce the risk profile of the wider local area (including the strategic allocation sites referred to above) as a location for housing investment and improve achievable sales values through market re-positioning which, as a consequence, would be likely to help unlock development on other sites in the local area that have stalled on viability grounds.

Physical Regeneration of the site

- 9.4 The Mardyke Farm site currently represents a blight on the local area in amenity terms. This position will be mitigated in due course through completion of the restoration scheme, which will establish a future baseline position of unmanaged natural greenspace.
- 9.5 However, there is a significant opportunity to achieve an enhanced physical outcome for the site through redevelopment (refer to developer's vision at Appendix

C), which would 'lift' the physical quality (and perceived attractiveness) of the wider area.

Infrastructure

- 9.6 The site offers the potential to accommodate a new school and would be expected to support the viability of transport infrastructure upgrades through increased patronage and CIL/s.106 contributions (in accordance with the standard tests). Such upgrades would firstly address any impacts generated by the development itself but would also be expected to deliver benefits to the wider community through support of strategic area-wide initiatives.
- 9.7 Local infrastructure upgrades would include potential opportunities for decentralised energy infrastructure.

Vitality and Viability of Rainham District Centre

- 9.8 The provision of new homes at the site would lead to a substantial increase in the district centre's walk-in catchment expenditure level, which would have a positive impact on the vitality and viability of the centre.

Conclusions – Implications for the New Local Plan

- Housing development on this site offers the opportunity to trigger wide ranging regeneration benefits. These range from the physical regeneration of the site to impacts on market conditions across the wider local area (which would assist in unlocking regeneration/housing delivery on other sites).

10. Summary and Conclusions

- 10.1 This representation sets out the compelling case for a revision of the Green Belt boundary to exclude the Mardyke Farm site from the Green Belt alongside the provision of a strategic site specific policy that allocates the site for housing (and associated development) in the emerging plan.
- 10.2 The case focuses on setting out the exceptional circumstances necessary to justify a revision to the Green Belt boundary which are considered to be as follows:
- i) The following development needs exist:
 - There is a need to identify additional land for housing development in the borough in order to meet objectively assessed housing needs;
 - There is a need to provide new social infrastructure (including a school) and to support the upgrade of other infrastructure (including transport) in the local area;
 - There is a need for regeneration (physical, social, economic) of the local South Hornchurch/Beam Park area; and
 - There is a need to secure a sustainable long term future (including management arrangements) for the site.
 - ii) The site makes a limited contribution to the purposes of including land within the Green Belt, therefore its value in Green Belt policy terms is limited (the release of the site from Green Belt is therefore not likely to give rise to significant harm). Similarly, the site is considered to have only limited value in Green Infrastructure terms (any loss/harm can be appropriately mitigated).
 - iii) The site is deliverable, with development able to address each of the development needs set out above and therefore realise significant planning benefits in terms of housing, infrastructure and regeneration:
 - It will be available for development from early 2017 (with delivery expected in the early part of the plan period);
 - It is suitable for housing development in environmental, technical, townscape, and infrastructure capacity terms; and
 - Development is a viable proposition, with a willing landowner and developer in place.

The Opportunity

- 10.3 The Developer's 'Vision' for the site is presented at Appendix C and highlights how the site could be developed to deliver approximately 1,500 new homes. The vision promotes a mix of housing types, with a focus on family homes, a new school and

community farm all set within an extensive landscaped environment including the provision for new sports and recreation, a village green and Public Park.

- 10.4 The vision for the site has been developed through the establishment of key design principles which flow through the site. These principles are considered in detail within the accompanying report to demonstrate how Mardyke Farm could be developed to deliver an exemplar and exciting new neighbourhood.

Procedural Considerations

- 10.5 The scale of the opportunity at Mardyke Farm and the ability for this to convert into new housing completions in the early part of the plan period, means that it would be appropriate to include the site as a 'strategic' allocation in the first part of the new Local Plan (as opposed to a subsequent Site Allocations DPD).

Next Steps

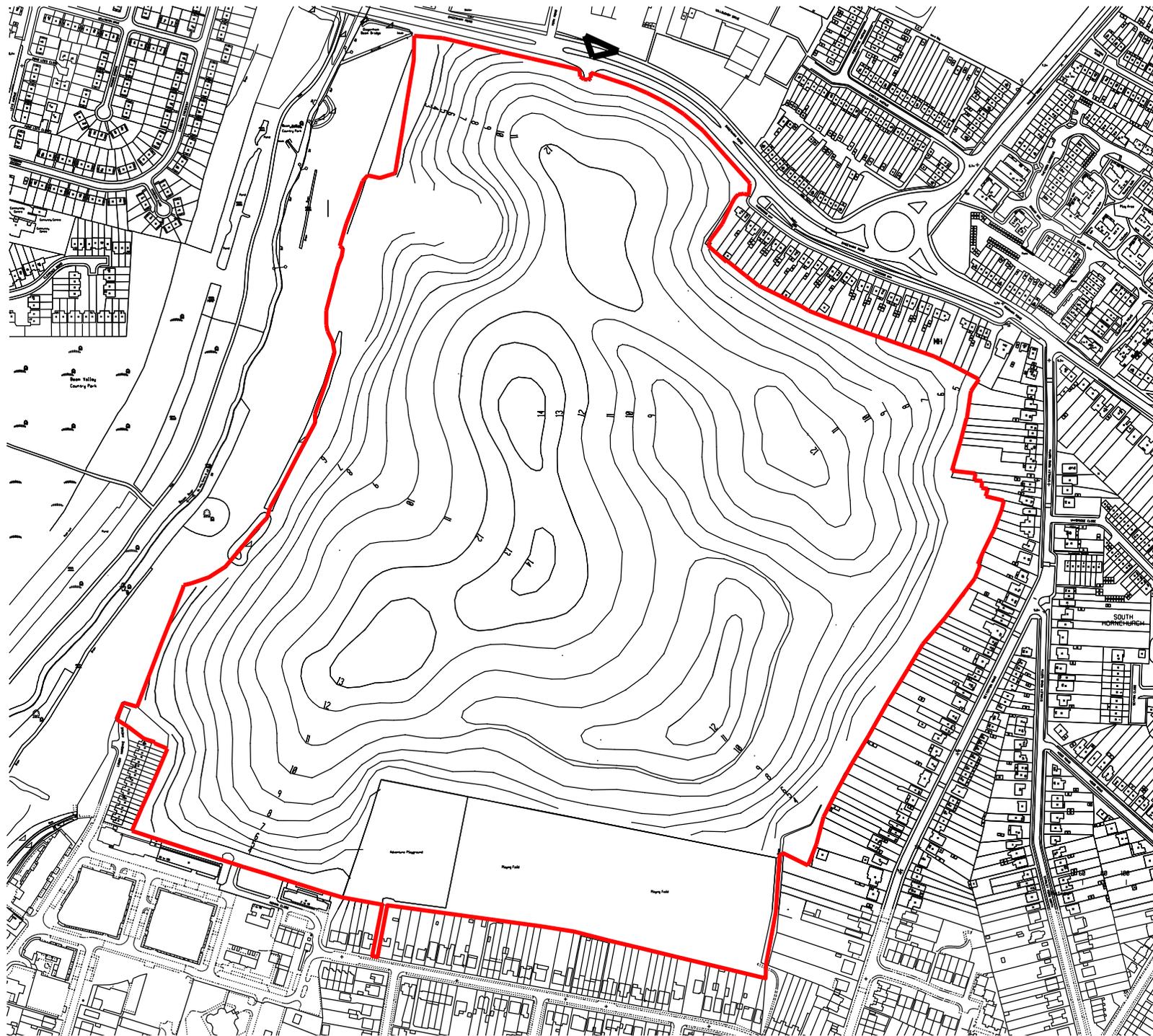
- 10.6 The landowner/developer is keen to work collaboratively with LBH and residents in the preparation of the new local plan and to ensure that the most appropriate policy position for the Mardyke Farm site is taken forward.

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Appendix A Site Plan



Mardyke Farm, South Hornchurch, Havering
1:5000 @ A4



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Report

**Appendix B
Approved /
Committed
Landscape
Plan**

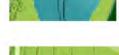
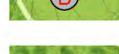
SUPPLY SCHEDULE OF MARGINAL AQUATIC PLANTS

Number	Species	Specification	Density
101 No.	<i>Alisma plantago-aquatica</i>	Well Rooted	1Ctr
101 No.	<i>Potamogeton nutans</i>	Well Rooted	1Ctr
104 No.	<i>Sparganium erectum</i>	Well Rooted	1Ctr

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NOTE:
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SHOULD THE SCALE MEASUREMENTS BE TAKEN BY MEANS OTHER THAN ELECTRONIC (e.g. FROM A PRINTED COPY), THE FOLLOWING MUST BE TAKEN INTO CONSIDERATION BEFORE SCALING IS UNDERTAKEN:
1. ENSURE THAT THE COPY HAS BEEN PRINTED/PLOTTED ON THE STATED SHEET SIZE WITH THE PLOTTING SCALE SET TO A CORRECT RATIO.
2. ENSURE THAT AN ADEQUATE ALLOWANCE (DEPENDANT ON THE STATED SCALE) IS MADE FOR THE INEVITABLE DISTORTIONS INTRODUCED BY PLOTTING/PRINTING AND COPYING PROCESSES.

Key

-  Invertebrate habitat
-  Mixed native scrub
-  Grass Paths
-  Public access points
-  Site Boundary
-  Sparse wildflower grassland
-  Running Water
-  Standing water
-  Wildflower meadow
-  Wild flower meadow and native scrub mosaic



KEY TO NATIVE GRASS/ WILD FLOWER SEED MIXES

- A** Species mix 3: sparse wildflower grassland Emorsgate Seeds EM7 Meadow Mixture @ 2-4 gms/ sq.m
- B** Species mix 1: wildflower meadow site-specific mix (refer to Ecological Restoration Plan) @ 2-4 gms/ sq.m
- C** Species mix 2C: mixed native scrub/ wildflower grassland mosaic: Emorsgate Seeds EM10 Tussock Mixture @ 2-4 gms/ sq.m
- D** Species mix 7B: invertebrate habitat wildflower mix: site-specific mix sown in max. 100 sq.m patches over max. 20% of each invertebrate habitat area (refer to Ecological Restoration Plan) @ 2-4 gms/ sq.m
- E** Species mix 6A: water margin Emorsgate Seeds EP1 mixture @ 2-4 gms/ sq.m

- PROGRAMME FOR PLANTING AND SEEDING
1. Ground preparation works for seeding will be undertaken in suitable weather conditions within six months of completion of the final filling and grading works and removal of all plant and machinery from site.
 2. All native tree and shrub seeding will be undertaken in suitable weather conditions in late autumn (mid-October to mid-December) following completion of ground preparation works under item 1, or as advised by specialist supplier.
 3. Wild flower/ grass seed mixes will be sown in suitable weather conditions in late March to early May following completion of the seeding programme for tree and shrub seeds in the preceding autumn.
 4. Marginal pond plantings will be undertaken in the late spring period (late April and May), prior to completion of seeding operations around the pond margins (seed mix E).

- Within shrub seeding areas, native shrub seed mix to be sown in single species seed beds of 7-15 sq.m. Individual seed beds to be irregularly shaped and randomly distributed within seeding area. Total area of seed bed allocated per species to conform to target formulation for final mix:
- 20% *Crataegus monogyna*
 - 15% *Cytisus scoparius*
 - 15% *Malus sylvestris*
 - 15% *Rhamnus catharticus*
 - 15% *Rosa canina*
 - 20% *Viburnum opulus*
- Note: seeding density per species to be advised by specialist supplier

- Within shrub seeding areas, native shrub seed mix to be sown in single species seed beds of 7-15 sq.m. Individual seed beds to be irregularly shaped and randomly distributed within seeding area. Total area of seed bed allocated per species to conform to target formulation for final mix:
- 15% *Cornus sanguinea*
 - 15% *Corylus avellana*
 - 20% *Crataegus monogyna*
 - 15% *Euonymus europaeus*
 - 15% *Ligustrum vulgare*
 - 20% *Prunus spinosa*
- Note: seeding density per species to be advised by specialist supplier

- Within shrub seeding areas, native shrub seed mix to be sown in single species seed beds of 7-15 sq.m. Individual seed beds to be irregularly shaped and randomly distributed within seeding area. Total area of seed bed allocated per species to conform to target formulation for final mix:
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- Note: seeding density per species to be advised by specialist supplier

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REV No

FLOYD MATCHAM
CHARTERED LANDSCAPE ARCHITECTS
URBAN DESIGN & MASTERPLANNING
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DORSET, DT101UB, 01747 828041, F:01747 828096
E:fm@floydmatcham.co.uk

DRAWING NAME
Landscape Layout

CLIENT
Ebbcliff Limited

PROJECT
Mardyke, Dagenham

JOB NO
TD481

DWG No
TD481_01B

SCALE
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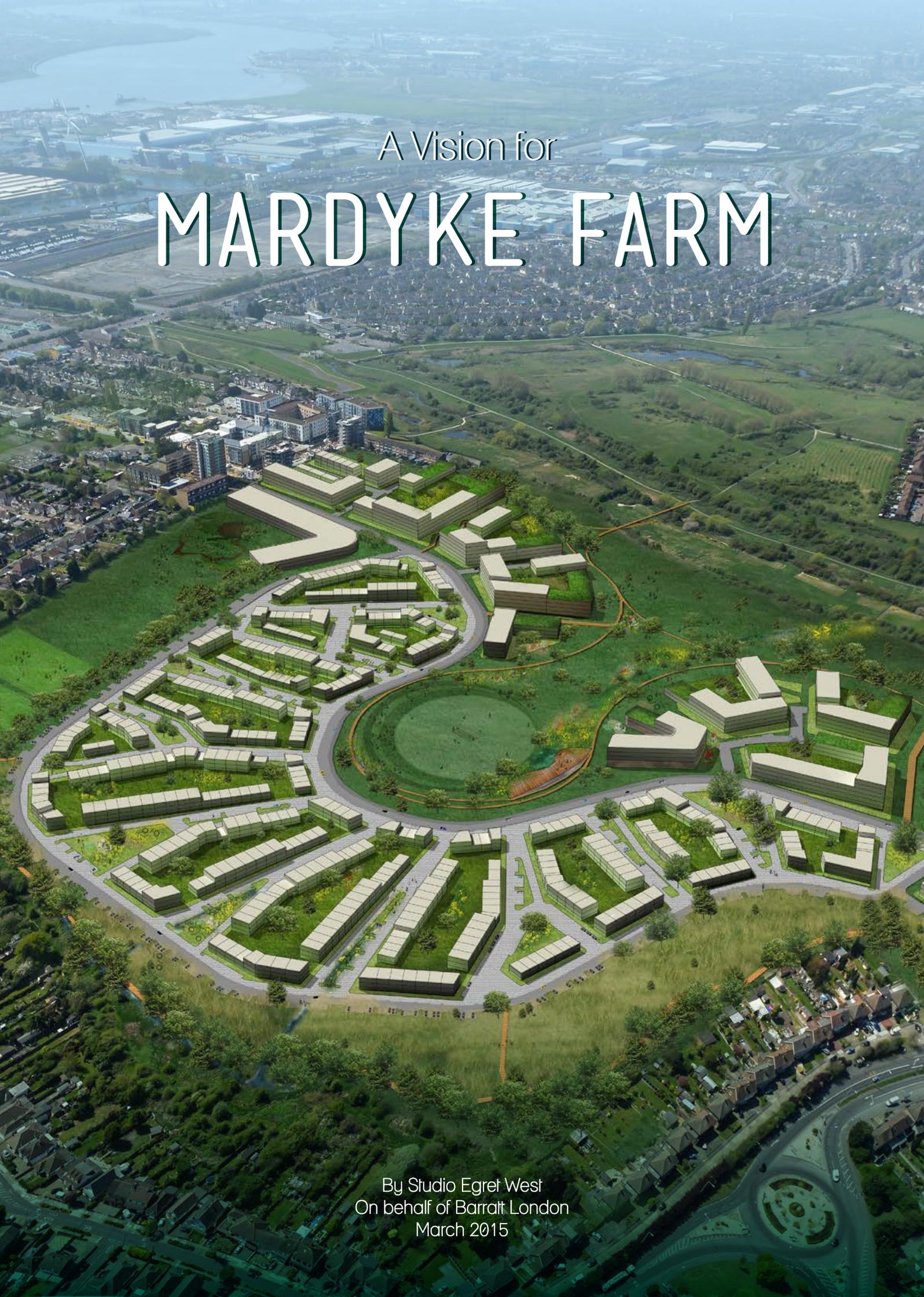
DATE
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Report

Appendix C Development 'Vision'



A Vision for
MARDYKE FARM

By Studio Egret West
On behalf of Barratt London
March 2015

This document sets out our vision for the future of Mardyke Farm and provides a concept highlighting how the site could be developed to deliver approximately 1,500 new homes. The vision promotes a mix of housing types, with a focus on family homes, a new school and community farm all set within an extensive landscaped environment including the provision for new sports and recreation, a village green and Public Park.

The vision has been developed through the establishment of key design principles which flow through the site. These principles are considered in detail below and highlight how the vision for Mardyke Farm has been developed to deliver an exemplar and exciting new neighbourhood.

Future Context

London is rapidly expanding. The city's population is projected to grow to 10 million by 2030. That means an additional one million people to accommodate in a city with an already insatiable demand for housing.

As we look to the future, the epicentre of London's regeneration process is shifting east. Vast swaths of land are being transformed into mixed use neighbourhoods together offering around 26,000 jobs and 16,000 homes in the London Riverside area. Investment in public transport infrastructure with a planned new station on the c2c line to London Fenchurch Street and an extension of the London Overground to Barking Riverside and Abbey Wood (connecting to Crossrail) will help unlock development potential and connect this part of London with the City and other key areas.

The LB Havering will deliver a significant portion of new housing at Beam Park over the coming years, but is nevertheless falling short of the London Plan annual housing target. More homes are needed, and more sites to deliver them.

Just north of Beam Park lies Mardyke Farm, officially part of the Green Belt but not very green. From 1860 to 1960, the site was extracted of gravel and sands, significantly reducing its recreational and ecological value. It was infilled with uncontrolled waste in the 1960s, and is today being restored using inert materials to create a new elevated landform with publically accessible grassland and wildlife habitats. But Mardyke Farm could be more than a natural landscape. It could be a natural landscape and the home of a new and ecologically driven residential neighbourhood; a low rise and organic framework of houses and apartments interwoven with a diverse range of managed green open spaces for people and wildlife that effectively extend the Beam Valley Country Park into the site and right to the doorstep of the neighbouring residential community.



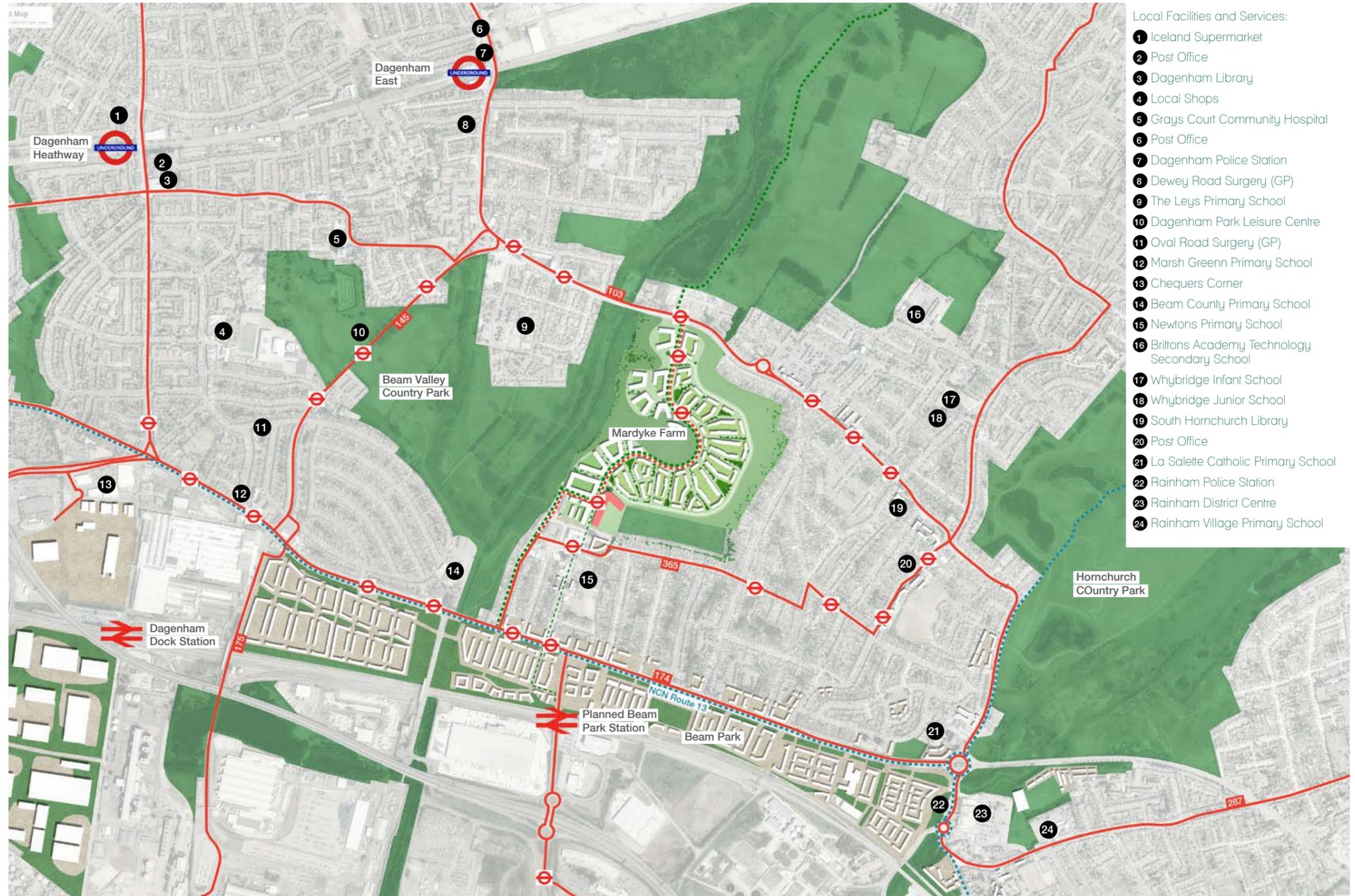
Future Context

Mardyke Farm sits in a low rise suburban environment of family homes with generous gardens.

The nearest stations are Dagenham East to the north (District Line) and Dagenham Dock to the south (c2c rail service). Plans for a new station at Beam Park will improve access to public transport and provide a 25 minute rail link to central London. Several bus services operate in the vicinity of Mardyke Farm, and with the potential for up to 1,500 new homes on the site, we believe that there is scope for a new bus route or alternatively a route extension to service the site. This route would ideally link with the planned Beam Park rail station and the future Barking Riverside Overground station to the south, as well as Dagenham East to the North.

A number of primary and secondary schools are located in the surrounding area, however with the injection of new family homes on the scale of Beam Park and Mardyke Farm, an additional school will be required. Local shops, services and community facilities are located at Dagenham East and Rainham District Centre approximately 1 km south east of the site.

The Sustrans National Route 13 of the National Cycle Network, which runs along New Road (A1306) will connect Tower Bridge in East London with Fakenham in Norfolk when complete.



Site Conditions

During the restoration of Mardyke Farm a 12 metre thick layer of clean inert material has been added to the site, dramatically altering its topography and creating a gently rising mound with a high point of 14 metres at the heart of the site, dropping to around 3 metres around the site perimeter.

The Beam Valley Country Park straddles the western boundary. Most of it is a Local Nature Reserve designated for its running water and associated wet grassland and ditch habitat.

A great crested newt population has been recorded in an open swale on the eastern boundary. The breeding pond and the key areas of terrestrial habitat are being retained and enhanced during site restoration.

An area of mature trees area located to the north west along the Beam Valley Country Park boundary.

Currently, the sole entry to the site is from Rainham Road South to the north. Two pedestrian walkways to the south provides access from Frederick Road to an existing area of sports and play.



Principle 1

Extending the Country Park

The Beam Valley Country Park is a 74 hectare landscape on previously derelict land.

The park is one of the area's greatest assets. The park has woodland and grassland, former gravel pits and the River Beam and Wantz Stream. Birds found on the site include kingfishers, reed warblers, reed buntings and skylarks.

Before Mardyke Farm was a working aggregate site, it formed part of this green open landscape. We want to reconnect the site with the Country Park by extending a finger of verdant green into the centre of the site to create a village green at the top of the hill with views across the Country Park.

This landscape is for everyone's enjoyment - new and existing residents, visitors and passers-by.

The existing tree planting is retained and enhanced.



Principle 2

A Generous Ecological Buffer

Mardyke Farm has been a working site for over 100 years, It has lain empty of development for a long long time.

So how to fill a void? Our answer is to establish a generous ecological buffer around the perimeter of the site along adjacent properties that shields and prevents being overlooked, to create a visual green for people and a protected habitat for wildlife.

At present, public recreational access is available to the south of the site only. The ecological buffer would increase site accessibility, welcoming pedestrians via controlled walkways to enjoy the many facilities and recreational assets on site.



Principle 3

A Central Spine for Walking, Cycling, Cars and Buses

A central spine connects the site with the surrounding area, bridging boundaries and inviting people in. We see this as a slow, pedestrian priority route for cars with the potential for an extended/new bus service.

A majority of vehicles would access the site from the north, whilst the southern access would service around 100 homes. A bus gate would limit through traffic to buses only.

A dedicated cycle lane runs the full length of the spine, linking to the Sustrans National Route 13 along New Road (A1306).

Bus stops are strategically located near key points of attraction: the play/sports fields to the south, the Village Green at the centre, and the main entry to the north.

A secondary perimeter route runs along the ecological buffer. We promote this as a shared surface street where cars slow down and cyclists and pedestrians take priority.



Principle 4

A School as an Anchor

With up to 1,500 new homes on the site and several regeneration sites in the neighbouring area, a new school is required to complement the existing offer.

The school is strategically located to the south of the site, providing easy access for both families living at Mardyke Farm and to those living in the neighbourhoods to the south.

The school site measures approximately 2 hectares, and will utilise the existing 4 hectare play/sports area for school activities. The school buildings can be used as community facilities after school hours



Principle 5

A Farm and Village Green as the Focus

Mardyke Farm takes its name from the historic farm that preceded the aggregate works. We want to bring back the farm to Mardyke Farm, right at the heart of the site, on the village green on top of the hill.

This is not a farm in a conventional sense - it's not only a place to grow fruits and vegetables to sell in the local farmers' market/ cafe, but it's a place to grow ideas and businesses in the form of an entrepreneurial hub. It's a place to cultivate creativity and to exhibit it to a wider audience in multifunctional communal spaces. It's a place for little people to grow up in the crèche.

In short, it's a fantastic local facility for residents and visitors, combining shopping with community facilities and local business.



Principle 6

As Many Family Homes as Possible

This is a family orientated area, and we have maximised the number of family homes on the site, varying from single family homes to maisonettes to mews houses and duplexes. Building heights range from 2 to 3 storeys.

The homes are arranged in a series of organically formed residential blocks accessed via green play streets.

The organic block forms create an easily navigable grain, whilst allowing moments of surprise and delight in the form of small pocket parks and open spaces for neighbours to meet, greet and play.



Principle 7

Fingers of Medium Density Accommodation Overlooking the Beam Country Park

The Beam Valley Country Park edge is populated by medium density buildings that open up towards the parkland to soak up the views. The buildings step down in height towards the site boundary, and as the ground level drops down towards the River Beam and Wantz Stream.

Family duplexes are arranged over ground and first levels, with apartments above. Communal podium gardens provide amenity and play.



Principle 8

Healing the Southern Edge

The south-western edge of the site is defined by the backs and exposed gardens of family houses and an apartment building within the Orchard Village Estate. These buildings deserve an improved setting, which we can deliver as part of the Mardyke Farm development.

We propose to “heal the edge” by completing the block with a new medium rise apartment building with internal mews houses and communal gardens.



Principle 9

A Network of Green Walkways and Cycleways

Green space is maximised on site to create a sense of houses in landscape, and to reinstate a strong connection to the Beam Valley Country Park.

Apart from the dedicated cycle lane, walking and cycling is encouraged through an extensive network of green routes that permeates the residential grain and extend into the neighbouring parkland to connect with existing trails and paths.

Pedestrian priority play streets are provided within the residential neighbourhood, linking with the central spine, to ensure the site is permeable and accessible.

A raised boardwalk within the ecological buffer makes this biodiverse environment accessible to people in a controlled way. A north-south boardwalk extends the western site boundary, weaving and meandering across the landscape, rising gently at the centre of the site to circumvent the village green.



Principle 10

Integrated Car Parking

Although significant public transport upgrades are on the agenda, the site's low PTAL rating (1-2) means that sufficient car parking standards are required.

Along the Beam Valley Country Park edge, undercroft car parking facilities are seamlessly integrated into the buildings, utilising the level change. The car parking is wrapped by residential uses. Communal amenity space provided atop, on podium level.

On street car parking is provided for the family homes, integrated into the play streets and along the perimeter street.

Overall, a parking ratio of 1:1 is provided for all homes.



Illustrative Masterplan

The Mardyke Farm neighbourhood has been designed with nature and ecology at the forefront, with a 4 hectare village green at the centre, an 8 hectare ecological buffer around the edge towards existing properties, 4 hectares of play/sports fields and a series of smaller pocket parks interwoven into the residential grain. All to maximise green space and to protect and enhance site ecology.

Shaped by the topography of the site, our masterplan provide up to 1,500 homes, a primary or secondary school, and space for shops, business and community facilities in the Mardyke Farm pavilion on the village green.

NUMBER OF HOMES

Houses: 250
 Maisonettes :350
 Duplexes: 250
 Apartments: 650

TOTAL: 1,500 homes



0 200m

Mardyke Farm

Existing View from South West



Mardyke Farm

Proposed View from South West



Mardyke Farm

Existing View from North East



Mardyke Farm

Proposed View from North East

Beam Park

The London Sustainable Industries Park

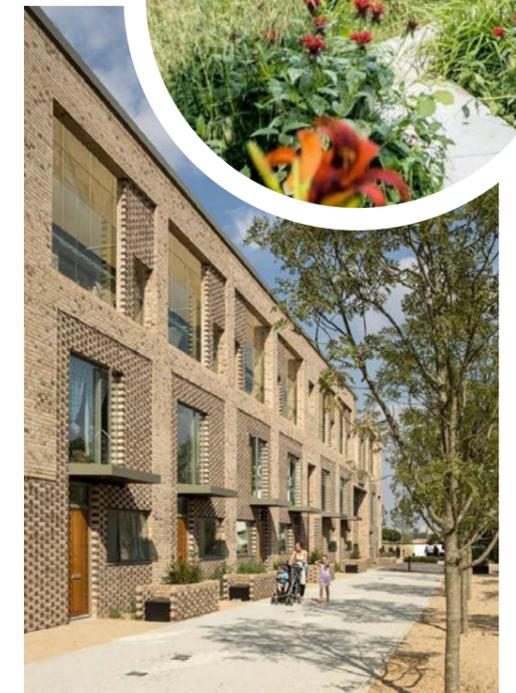
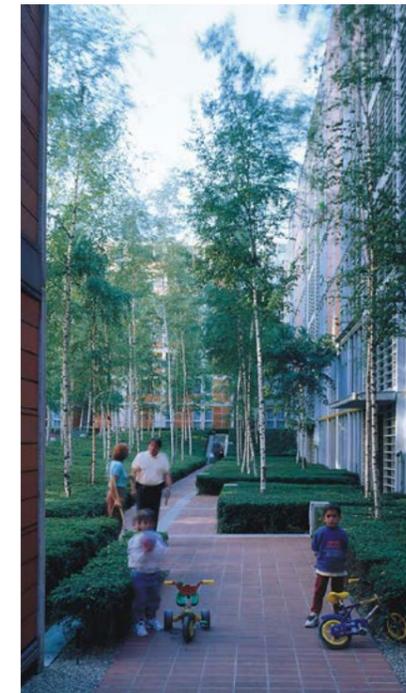
Barking Riverside

Orion Park and Merrilands Crescent

Rippleside and Goresbrook Village

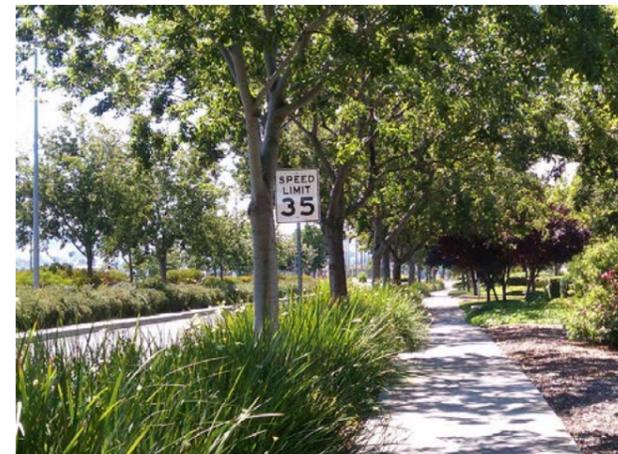
Neighbourhood Study

Beam Park Edge



Neighbourhood Study

Houses and Play Streets



Neighbourhood Study

School



Neighbourhood Study

The Farm Pavilion



Existing Landscape & Topography

The existing site could be perceived as a man-made mountain. It is a plateau of unfinished landscape potential which can enhance its green belt setting if given a proper treatment.

At 14 metres AOD, the site is highly visible from the Beam Park Nature Reserve to the west. From the top of the mound, the site gently slopes at a gradient of 1:30, and then more steeply (1:15) around the site perimeter where it blends into the surrounding topography and grades into the back gardens of adjacent properties.

An agreed approach to the restoration/ remediation of the site has been developed to best locate ecological enhancements and improvements on the site.

The following proposals work hand in hand with the restoration scheme to avoid major excavation/earth moving for construction of homes and road infrastructure (to be confirmed by engineer). This allows for ample ecological mitigation to highlight the sites importance next to the Beam Parklands which could serve as a major driver to attract visitors to the area.



Landscape Design

The site has a great farming history and there is even mention of a 17th century windmill.

To enhance the site's setting, a countryside landscape is proposed to remind users of the site's history. This can be replicated with boundary treatments of loose stone walls, hedgerows, hedgebanks, and almost a barn/farm yard vernacular.

Building upon the principles set by the masterplan, key moves have been identified to unlock the site's landscape potential to enhance its natural beauty while still meeting the amenity requirements of a growing community.

A series of curved boardwalks and paths allow seamless connections north and south to existing and future transport stations and to neighbouring residential areas. Gateways and entrances east and west will also allow better use of the Beam Parklands and to help existing residents in South Hornchurch use the park.

The following sections highlight the key components of the landscape design.



Eastern Ecological Buffer

The proposed development will provide an 8 hectare dedicated ecology area along the eastern and southern edge of the site.

The vast majority of this ecology area will comprise retained areas of swales, rough wildflower grassland, ruderal and scrub, with smaller areas of retained native scrub and woodland belts as well as new wet pond features. The project ecologist has advised an appropriate approach to both the retention and future management of this landscape. This approach will be as follows:

- Retain/enhance the existing ecologically rich landscape and embrace its valuable environmental qualities;
- Enhance people's experience of the area by providing raised timber boardwalks and seating areas;
- Enhance existing wetland and marginal landscape environment, combining further diversity and offering additional ecological habitat opportunities;
- Provide viewing platforms and information boards to allow appreciation of ecological habitats;
- Take appropriate management actions such as the removal of non-native, overly aggressive, or un-desirable species from these areas, to encourage the growth of other more desirable species that are present.



Beam Park Interface

Wherever possible existing trees will be protected and retained.

As the site slopes west towards the Beam River, we propose to reinforce the earth with additional tree planting. A mix of lower native scrub planting will reinforce stability and allow for views from the village green across the parklands ensuring natural surveillance.

The Boardwalk will become a publicly accessible space, providing access to Mardyke Farm and long distance views across the landscape. Hovering breakout seating areas cantilever into the park and add a unique element of identity to the development. Hedgerows and other types of planting limit visual intrusion from the Beam Valley Country Park.

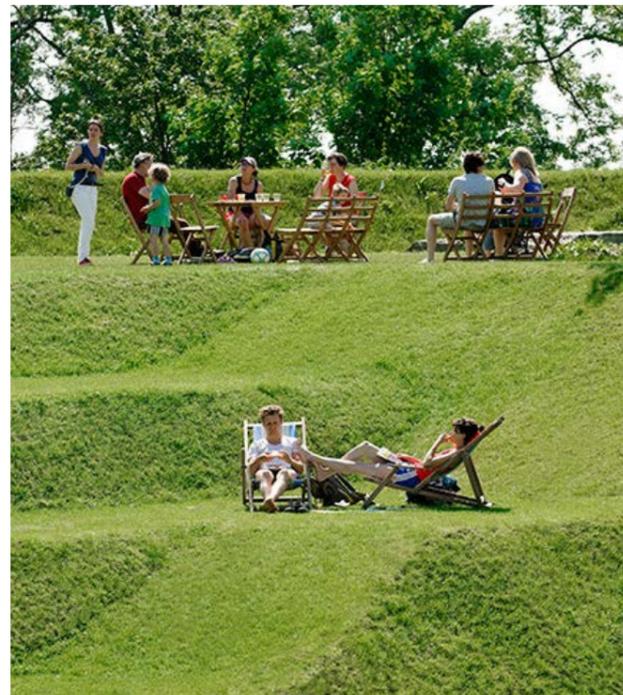


Village Green

The traditional definition of a village green is 'a common open area within a settlement'.

A village green usually consists of common grassland and it is often located at the heart of a rural settlement. Historically a village green would have been used for grazing. At the centre of the masterplan is a proposed village green that will provide a place for residents to gather and remember the history of Mardyke Farm long ago. The space will have a community focus and flexibility to accommodate a changeable program of events and activities. It is located at the highest point of the site, maximising views across the adjacent parkland and beyond. Some of the key features of the village green will be:

- Open lawn with a mix of semi mature specimen trees;
- An informal play space for ball games, exercising or picnics;
- Open space with overlooking and passive surveillance by neighbouring properties and surrounding footpaths and roadways;
- Sculpted earthworks to contain the main green space, create informal seating banks around the edge of the green and focus users into the centre of the space;
- Ecology/SUDS features to connect the site and create a heart of the drainage and potential flooding story. These can help feed allotments or other growing spaces for residents.



Intergrated Play/Amenity Spaces

A variety of doorstep play for all ages and abilities is accommodated within a series of pocket parks.

The play and amenity areas will accommodate the following:

- Inclusive access connecting each space;
- A 'farming' and rolling hill vernacular with loose stone walls, large mounds and farm animal play equipment throughout;
- Play equipment that is natural in form and appearance providing an attractive mix of play apparatus;
- Planting that is integrated throughout and heightens the play experience. Planting has been carefully selected to offer sensory attributes of scent, colour, touch and sound;
- Integration between building fronts and the landscape.



Private Residential Gardens

Private gardens can function both as a fantastic amenity for families and as ecological corridors.

We propose a series of garden trees and shrub planting with visual and ecological interest to tie in with the overall masterplan.

There is also potential to incorporate living roofs, which can serve as interconnected corridors for birds and other wildlife.



SUDS Corridors

The neighbouring Beam Park Local Nature Reserve is very flood sensitive. We wish to capitalise on this and use it as an opportunity to educate residents about water retention.

A key corridor is created from the top of the hill, the village green, with water moving through a system of planted terraces that can. The water then moves down the hill in both eastern and western direction towards either the Beam River or the ecological water features to the east. In the residential neighbourhood, the SUDS corridor is incorporated into a strong "home zone" streetscape with trees using the water to help create verdant living front doors to the homes.

To achieve this, the following features are proposed:

- Indigenous species throughout the SUDS corridor, capturing ecological qualities of the native grassland meadows;
- Step free pedestrian access meandering through the ecological corridor;
- Ecologically rich planting;
- Informal natural play and seating opportunities.



School Grounds

The external school grounds are an important aspect of the school design. Boundaries between outside and inside are purposely blurred, adding different outdoor ecological experiences that help tell the story of the site and its history.

The external space is composed of the following playful, imaginative design features:

- Play spaces set on different levels stepping down the hillside;
- Integrated, curved and fully accessible ramped access;
- Colourful and varied materials offering a fun challenging and diverse external environment;
- Sports provision;
- Play and fitness equipment and features;
- A variety of outdoor learning spaces able to accommodate both small groups and larger groups for outdoor activities and learning;
- Planting that has a calming and beneficial effect with sensory species used throughout play spaces, a variety of trees, orchard planting and robust boundary planting to discourage children playing or accessing areas close to the top boundary walls;
- Allotment beds for growing vegetables and to encourage outdoor learning;
- Amphitheatre for school gatherings and meetings;
- Cycle and scooter parking;
- Entrance space for meeting and greeting.

The sports ground is open to the public after school hours.

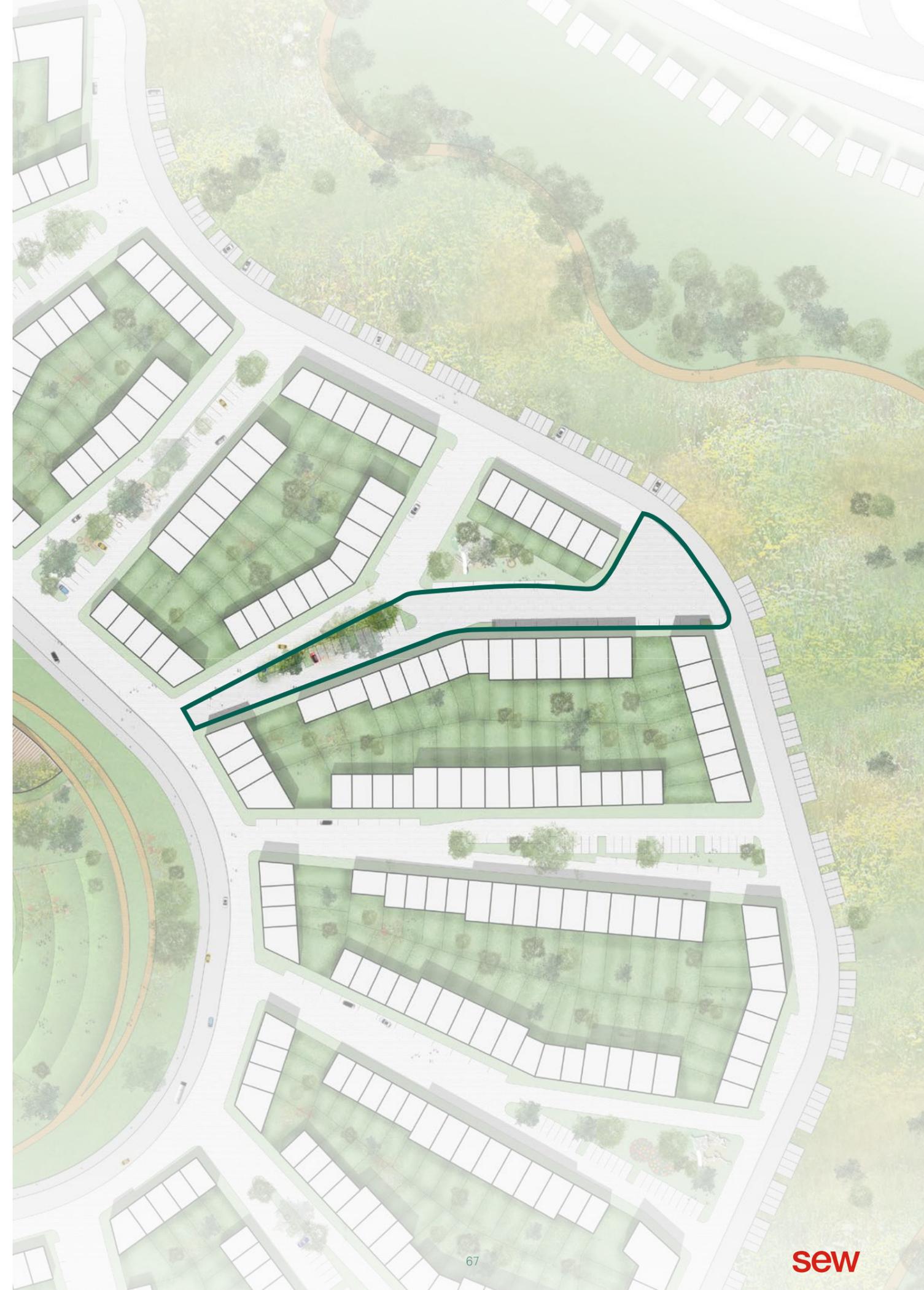


Street Typologies

A range of street typologies will reflect the anticipated use of each street. Wherever possible we have taken measures to introduce planting, traffic calming and a warm palette of natural materials.

Our proposals aim to achieve the following:

- Pedestrian safety and priority;
- Integrated planting on each street layout;
- Integrated Sustainable Urban Drainage;
- A changing planting character for each typology to avoid repetition and provide interest all year round.



Courtyards

As the majority of courtyards are open sided to the Beam Valley Country Park, they must have the ability to enhance the ecological capacity as well as adding amenity value.

This can be done by maximising the amount of planting and softscape with mounding that can resemble the mounding on the main part of the site but on a smaller scale. Mini mounds create some vertical interest for play or amenity while some can become oasis of verdant ecology and even SUDS capacity. The curvy nature of these areas creates softness to the site and a slight diversion from the rigidity of the apartment blocks. The courtyards must also integrate with the green roofs that step down the hillside to create a complete experience of nature and ecology.



Materials

A single high quality and robust palette of materials is proposed throughout the site, primarily following the character areas identified earlier.

Natural aggregate concrete paving carpets that delineates the main pedestrian routes through all areas of public realm. Change in paving type is used to announce key entrances and areas of public open space. Resin bound gravel is used in areas more sympathetic to surrounding ecology or to mediate between areas of paving and areas of rubberised play surface. To help identify the school grounds as something different and unique within the masterplan, a splash of colour is proposed to the play spaces.

The materials chosen will reflect the earthy colours of the former farm and complement the architectural materials. This subtle approach to paving detailing provides a high quality canvas that integrates the surrounding landscape and architecture. To ensure that infrastructure does not overwhelm the external environment we intend to use raised tables at key pedestrian crossings and for all residential streets rumbled concrete sets will be the preferred carriageway surface. If level changes across the site necessitate retaining structures, stone walls will be complementary to the overall material palette. As important as the materials themselves is the quality of workmanship in constructing the landscape, this is important for longevity of the site.

The majority of the site will have footpath gradients less than 1:21, where steeper gradients are required, these will be compliant to relevant and prevalent standards (at the time of writing, BS 8300:2009).

Surfaces will be designed in accordance with prevailing standards, where technical design constraints, aesthetic aspirations and access/inclusive design issues are in conflict, consultation will take place to establish an acceptable solution. Contrast surfacing will be used to delineate crossings in shared surface areas.



Planting

Tree Planting Design

The tree species planting palette would be greatly influenced by the existing mixture of trees existing along the site boundaries. The proposal aims to strengthen these environments with a rich woodland mix that overtime will mature to reinforce the slopes of fill and add ecological and visual interest.

Site wide street trees will continue to pioneer the site providing a network of trees along each residential street. Species vary with a mix of native trees such as Sorbus aucuparia and Acer campestre combined with damp tolerant trees for SUDS beds, such as Alnus glutinosa and narrow columnar forms such as Quercus robur Fastigiata Koster.

Larger species such as Liriodendron tulipifera, Robinia pseudoacacia and Quercus robur could be strategically located to enhance wayfinding throughout the site. Feature trees will be implemented within the Village Green forming a memorable parkland space.

Trees will also be selected for their changing seasonal colours, blossom, form and fruit. Clusters of birch and cherry trees will provide a fresh pioneering backdrop of native species, whilst Liriodendron tulipifera and Quercus palustris are used as feature specimens to define entrances and significant external spaces.

Natural Grassland and Wildflower Planting Design

A substantial amount of grassland meadows will be created for the ecological buffer. These will create areas of open habitats that are characteristic of the previous conditions on the site, including sparse wildflower grassland, scrapes and bare-ground which are ideal for notable invertebrates and birds.



Long Sections



Long Section A



Long Section B

Short Sections



Short Section A



Short Section B



Short Section C

MARDYKE FARM

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A Bilfinger Real Estate
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Report

Appendix D Transport & Access Appraisal

BARRATT LONDON

**PROPOSED MIXED-USE ALLOCATION:
LAND AT MARDYKE FARM, SOUTH
HORNCHURCH**

TRANSPORT AND ACCESS APPRAISAL

**REPORT REF NO W420-01
PROJECT NO. W420
MARCH 2015**

**PROPOSED MIXED-USE ALLOCATION:
LAND AT MARDYKE FARM, SOUTH HORNCHURCH**

TRANSPORT AND ACCESS APPRAISAL

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**REPORT REF. NO W420-01
PROJECT NO. W420
MARCH 2015**

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- Figure 1 Site Location and Local Facilities Plan**
Figure 2 Public Transport and Cycle Route Plan

DRAWINGS

- W420-SK01A Proposed Site Access – Signalised Junction**
W420-SK02A Proposed Site Access – Roundabout Junction
W420-SK03 Indicative Bus Gateway Restriction
W420-SK04 Indicative Southern Access (Roman Close)
W420-SK05A Indicative Southern Access (Lower Mardyke Avenue)

APPENDICES

- A Census Travel to Work Data**
- B PTAL Calculations**
- C Indicative Masterplan Plans**
- D TRICS/TRAVL Data and Trip Generation Calculations**
- E Traffic Flow Diagrams**
- F ARCADY Outputs: Proposed Site Access Junction (Option 1)**
- G LINSIG Outputs: Proposed Site Access Junction (Option 2)**

DOCUMENT CONTROL SHEET

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	1 st draft for project team review	CB	SJH	CBP	27/02/15
1	Final version for client approval	CB	SJH	CBP	04/03/15
2	Final version following client comments	CB	SJH	CBP	10/03/15

EXECUTIVE SUMMARY

Barratt London are progressing a planning strategy for the 37ha Mardyke Farm site which is situated on land to the south of the A1112 (Dagenham Road) to the west of South Hornchurch in Havering. The strategy seeks to secure a revision of the Green Belt boundary to exclude the site from the Green Belt, as well as a site specific policy that allocates the site for housing and associated development. It would then be the intention to secure the reallocation within the emerging Havering Local Plan.

There is a wide selection of services and facilities in the vicinity of the site which cater for everyday needs. The site is within walking distance of a number of bus stops which are served by routes that run towards Romford, Rainham, Barking and Dagenham. The London Riverside Opportunity Area (LROA) is situated immediately to the south of the site. There are a number of improvements proposed within the LROA including a new railway station at Beam Park and additional bus connections. These will therefore improve the public transport accessibility of the area and will allow residents to access a wider range of employment opportunities without needing to use the private car.

The proposed development will take primary access from the A1112 to the north in the form of a new roundabout or signal controlled junction. This access will serve the majority of the site and the internal site access road could form a loop-type arrangement. A second point of access could also be provided to the south via Lower Mardyke Avenue or Roman Close. Although Roman Close is not currently adopted, it has recently been improved as part of the Orchard Village development. The proposals would offer the opportunity to provide improvements to the A1112 to the north of the site including additional crossing opportunities for pedestrians and cyclists.

The proposals will form connections with the existing pedestrian and cycle networks in the area. The main internal site access roads will contain footways on both sides to facilitate pedestrian movements through the site. A segregated cycleway could also be provided through the site to link the existing cycle routes along the A1112 to the north and the A1306 to the south. There may also be potential to provide a shared cycle/footway along both sides of the A1112 in the vicinity of the site to enhance the accessibility of the site for cyclists.

The proposals could also offer the opportunity to provide a bus link through the site which could be served by existing bus services in the area. New bus stops would be provided as part of this arrangement to reduce walking distances, improve bus connections between the north and south and further integrate the site with the surrounding area. There could also be the potential to provide a bus gate to prioritise bus movements within the site and reduce bus journey times. These proposals would improve north-south bus connections between the LROA, the site, Romford and future Crossrail.

A total of two options have been examined for the proposed site access junction with the A1112 to the north of the site. The first option featured a single roundabout access. The second option featured a single traffic signal junction. Initial modelling has revealed that both junction arrangements have the potential to operate within capacity during the future development year of 2031. The signal controlled option was shown to operate further within capacity limits and may therefore offer a more long-term solution. However, further investigation would be required as part of a more detailed transport assessment to substantiate these findings.

This transport appraisal demonstrates that a proposed residential development at the site (with associated uses) would offer a wide variety of benefits to the surrounding area. The site is also situated in a sustainable location and the proposals and their improvements are considered to be in accordance with current national and local policy. In view of the above, we consider that the site is suitable for allocation as a residential development in transport terms.

1.0 INTRODUCTION

- 1.1 Ardent Consulting Engineers (ACE) has been appointed by Barratt London to advise on the transport opportunities and constraints relating to the proposed allocation of land at Mardyke Farm for residential use and associated development. The site is situated in the vicinity of Beam Park to the west of South Hornchurch in Havering.
- 1.2 The London Borough of Havering (LBH) is the local planning authority and the local highway authority. Transport for London (TfL) are statutory consultees given the site location and development size. TfL is also the highway authority for the A13 which is classified as a "Red Route" and forms part of the Transport for London Road Network (TLRN) approximately 1km to the south of the site. The site is located within the northwest corner of the South Hornchurch ward and is located adjacent to the London Borough of Barking and Dagenham's (LBBD) eastern boundary.
- 1.3 This appraisal has been prepared in support of an allocation of the site to provide a residential development (with associated uses) in the emerging Havering Local Plan, which will cover the period until 2031. Initial discussions have been held with LBH Highways to understand their position with regards to the site, transport and access.
- 1.4 The report investigates potential access options that could be provided to serve the proposed residential development (with associated uses) on land to the south of the A1112 (Dagenham Road). Access has been investigated and designed with reference to current design guidance including Manual for Streets (MfS) and the Design Manual for Roads and Bridges (DMRB).

1.5 Following this introduction, the remainder of the report is structured as follows: -

- **Section 2.0** describes the site location and existing conditions surrounding the site including accessibility and facilities;
- **Section 3.0** examines existing local policy and provides details of the London Riverside Opportunity Area situated immediately to the south of the site;
- **Section 4.0** provides details of the proposed development and the likely trip generation and distribution;
- **Section 5.0** investigates two potential vehicular access options which could be used to serve the site from the north and undertakes the associated modelling;
- **Section 6.0** provides details of the internal design and off-site considerations that should be used to inform the design and layout of the proposed development; and
- **Section 7.0** summarises the potential benefits that the proposed development of the site could bring to the surrounding area.

2.0 SITE LOCATION AND EXISTING CONDITIONS

Site Location

2.1 The site is approximately 37ha in area and is located to the west of Rainham and South Hornchurch and to the southeast of Dagenham as shown at **Plate 1** and in more detail at **Figure 1**. The site is bordered by the A1112 (Dagenham Road) to the north, residential properties to the east and south, the Orchard Village housing development to the south and Beam River to the west.

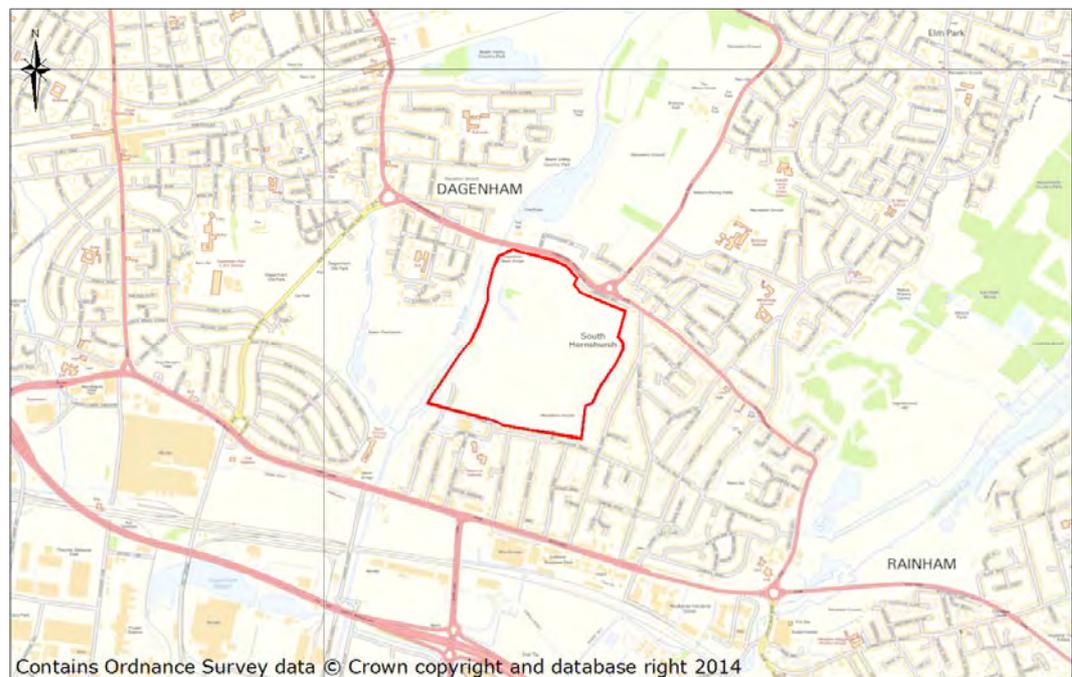


Plate 1: Site Location

Existing Use

2.2 The site is currently being restored with completion due in April 2017. The 4ha area to the south of the site, which is owned by the London Borough of Havering, is currently being used for recreational purposes. This area is situated to the rear of the residential dwellings on Frederick Road and can be accessed via footways from Frederick Road to the east and Roman Close to the west.

Existing Access Arrangements

- 2.3 An existing access is located to the north of the site which forms a priority junction with the A1112 (Dagenham Road). This access is situated approximately 300m to the west of the A125/A1112 roundabout.
- 2.4 There are also a couple of stopped-up accesses which run into the site from the south. Lower Mardyke Avenue runs into the southwest portion of the site for a distance of approximately 50m. A spur road also feeds off Roman Close which although not currently adopted, has recently been improved as part of the Orchard Village development. Further details are provided later in this section.
- 2.5 As previously noted, pedestrians are able to access the southern portion of the site to the rear of the residential dwellings on Frederick Road via footways which can be accessed from Frederick Road and Roman Close. The existing vehicular and pedestrian access arrangements for the site are shown on **Plate 2**.

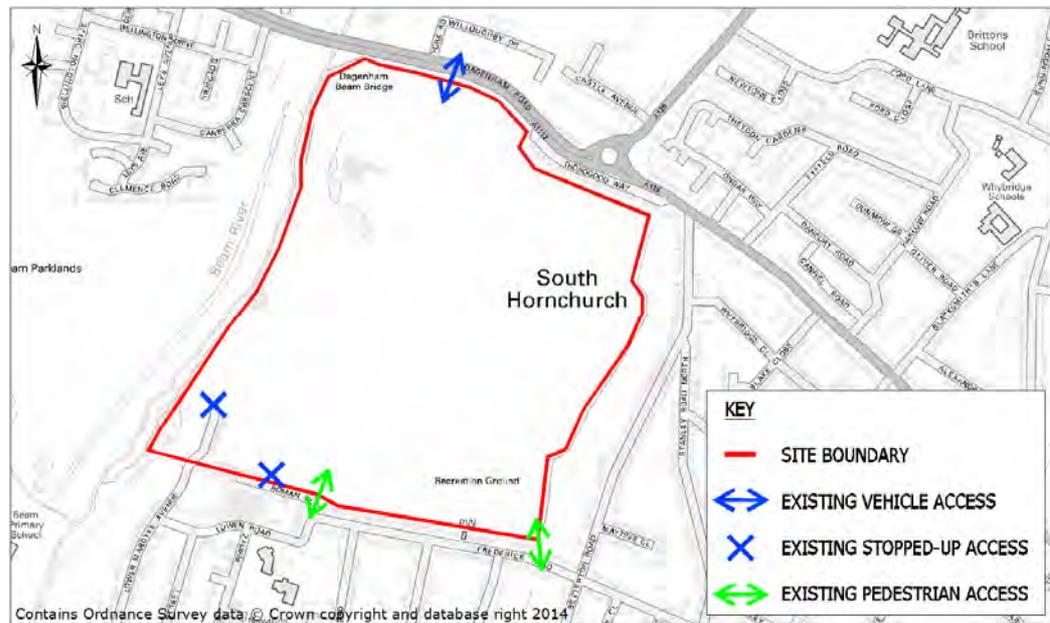


Plate 2: Existing Access Arrangements

Existing Travel Patterns

2.6 To determine the existing travel patterns of residents living in the area, 2011 Census Method of Travel to Work data has been obtained for the South Hornchurch ward where the site is located. This information is presented below in **Table 2.1** and the full data is contained within **Appendix A**.

Table 2.1: Method of Travel to Work Mode Share for the South Hornchurch Ward (source: 2011 Census)

Mode	Share
Underground, Metro, Light Rail, Tram	12.5%
Train	10.2%
Bus, Minibus or Coach	9.9%
Taxi	0.8%
Motorcycle, Scooter or Moped	1.0%
Driving a Car or Van	54.8%
Passenger in a Car or Van	4.7%
Bicycle	1.3%
On Foot	4.2%
Other Method of Travel to Work	0.6%
Total	100.0%

2.7 **Table 2.1** shows that although the majority of residents living within the Ward currently drive (55%), there are opportunities to use bus, London Underground and train services with approximately 33% residents using public transport. The proportion of users travelling on-foot (4%) and by bicycle (1%) is however low and the proposals would provide the opportunity to increase the uptake of these modes such as by improving pedestrian and cycle routes and connections.

Orchard Village Development

2.8 The Orchard Village development is situated to the south of the site and is bounded by Lower Mardyke Avenue, Walden Avenue, Lowen Road and Roman Close. The proposals include up to 555 new homes and an approximate investment of £80 million to regenerate the former Mardyke Estate and improve the lives of residents and the community in the area.

2.9 The first two phases (approximately 200 new residential dwellings) have now been completed and the construction of Phase 3 is currently underway. Phase 3 is projected to be completed late

2014/early 2015 and will provide further residential units, as well as community and retail uses.

- 2.10 The proposed development will provide the opportunity to integrate the site with the Orchard Village development including by means of secondary access to the south via Roman Close or Lower Mardyke Avenue for example. The site will also benefit from the investment being made including the improvements to the local highway network and the additional facilities which will be available to residents.

Local Highway Network

A1112

- 2.11 The A1112 (Dagenham Road) borders the site to the north and is classified as an "Urban All-Purpose" dual carriageway (UAP2) based on the road types contained within DMRB TA 79/99. The A1112 accommodates an Annual Average Daily Flow (AADF) of approximately 21,800 vehicles based on traffic flows provided by the Department for Transport (DfT) for 2013. Further details of traffic flows along the A1112 are provided later in this section.
- 2.12 The A1112 commences at the roundabout junction with the A125 at its eastern extent and then runs westwards towards the roundabout junction with the B178. The A1112 then runs northwards through Dagenham East and Chadwell Heath towards the A12 in the form of a single carriageway with one lane in each direction.
- 2.13 The A1112 is subject to a 30mph speed limit, is street lit and contains footways on both sides between the A125 and B178 roundabout junctions. Although the A1112 consists of two lanes in each direction in the vicinity of the site, the nearside lane is taken up by a bus lane in each direction. The bus lanes are in operation at

all times and can be used by buses, cyclists and taxis. The bus lanes are replaced by cycle lanes further to the west where the A1112 enters a residential area and remains a dual carriageway with one lane in each direction. There are a number of bus stops located along the A1112 which are served by bus route 103.

A125

2.14 The A125 (Rainham Road) forms a three-arm roundabout junction with the A1112 to the north of the site and runs northwards towards Romford via Elm Park and Rush Green, as well as to the east through South Hornchurch towards Rainham and the A1306. The A125 is a single carriageway road which is street lit and subject to a 30mph speed limit. The A125 runs through residential areas, has footways on both sides and provides uncontrolled and signalised crossings for pedestrians. Bus route 103 runs along the A125 to the east.

2.15 The A125 is a principal route which accommodates an AADF of approximately 31,800 vehicles to the north of the A1112/A125 roundabout and 25,200 vehicles to the south of the A1112/A125 roundabout based on 2013 flows provided by the DfT. The A125 is classified as a UAP1 single carriageway road based on DMRB and predominantly carries through traffic.

B178

2.16 The B178 (Ballards Road) forms a three-arm roundabout junction with the A1112 to the northwest of the site and runs southwards towards the A1306 (New Road). The B178 is a single carriageway road which is street lit and subject to a 30mph speed limit. Footways run along both sides of the carriageway and segregated cycle lanes are also in place along part of the link as it runs through a park. The B178 passes through a residential area to the south of

the park and accommodates bus stops which are served by bus route 145.

A1306

- 2.17 The A1306 (New Road) runs to the south of the site and forms two junctions with the A13 including near Purfleet to the southeast and to the south of Dagenham near Dagenham Dock railway station to the west. The A1306 also forms a signalised junction with Lower Mardyke Avenue (which provides a link into the site), as well as a signalised junction with the B178 and a roundabout junction with the A125 as outlined above.
- 2.18 The A1306 is a dual carriageway road which is street lit, subject to a 30mph speed limit and consists of two lanes in each direction in the vicinity of the site. Bus lanes run along the nearside lane of the A1306 in each direction in a similar fashion to the A1112 to the north of the site. Bus routes 145, 165, 174, 175, 287, 365 and 372 run along the A1306.
- 2.19 The A1306 is a principal route which accommodates an AADF of approximately 13,100 vehicles in the vicinity of the junction with Lower Mardkye Avenue (based on 2013 flows). It is therefore considered that the A125 is classified as a UAP3 dual carriageway road which carries mixed traffic and provides frontage access, bus stops and pedestrian crossings.

Other Local Roads

- 2.20 Frederick Road borders to the south, forms a priority crossroads junction with Betterton Road to the east and turns into Lowen Road at the priority junction with Roman Close to the west. Roman Close also borders the site to the south and has recently been improved as part of the Orchard Village development e.g. it now features shared surfacing to improve access for pedestrians and cyclists. A spur

road currently runs northwards from Roman Close into the southern part of the site where it is currently stopped-up. It should be noted that Roman Close is not currently an adopted highway.

2.21 Lowen Road runs between Roman Close to the east and Lower Mardyke Avenue to the west. Lower Mardyke Avenue runs in a north-south direction and provides access into the southern section of the site where it is also currently stopped up.

2.22 The local single carriageway roads outlined above contain one lane in each direction, are traffic calmed, subject to 20mph speed limits and primarily serve residential dwellings including the Orchard Village development. Frederick Road, Lowen Road and Lower Mardyke Avenue are also served by bus route 365 which runs in a westbound and then southbound direction.

2.23 **Plate 3** shows how the site fits in with the surrounding local highway network.

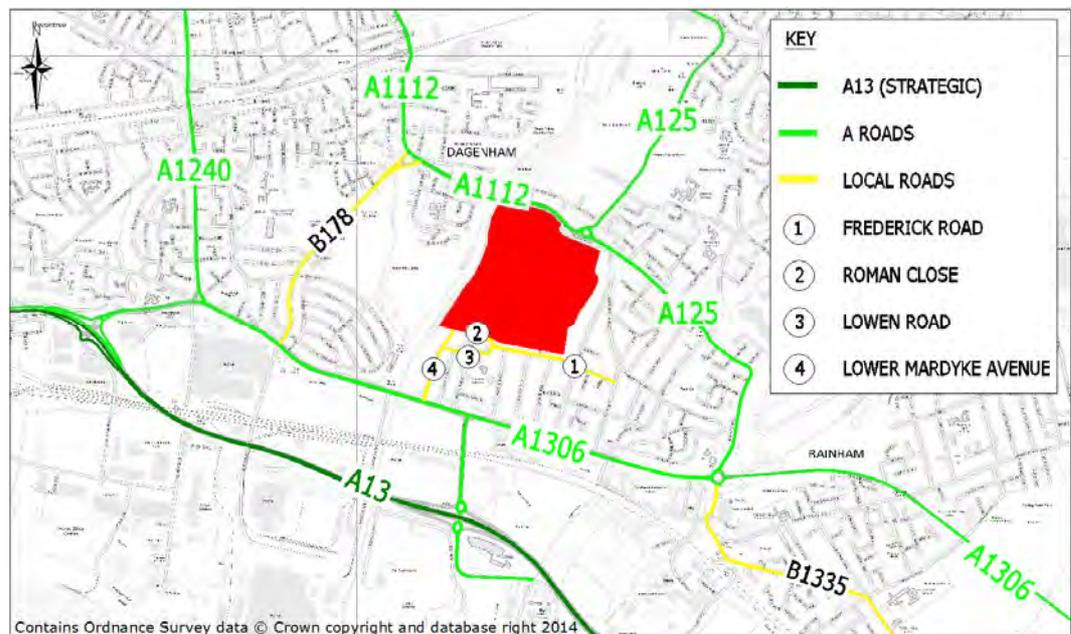


Plate 3: Local Highway Network

Strategic Highway Network

A13

2.24 The A13 runs in an east-west direction to the south of the site and can be accessed via the A1306 New Road. The A13 is classified as a "Red Route" and forms part of the Transport for London Road Network (TLRN). The A13 forms a junction with the M25 at Junction 30 approximately 8km to the east of the site where it then continues eastwards into south Essex. The A13 also runs towards east London and forms a junction with the A406 North Circular Road approximately 7km to the west of the site.

2.25 The A13 is a dual carriageway road and consists of three lanes in each direction to the south of the site. The A13 accommodates an AADF of approximately 84,000 vehicles in the vicinity of the junction with the A1306 (based on 2013 flows). The A13 is classified as an "Urban Motorway" (UM) dual carriageway road based on DMRB, which provides a through route with grade separated junctions.

A12

2.26 The A12 runs in an east-west direction to the north of the site and can be accessed via the A1112. The A12 is also classified as a "Red Route" and forms part of the TLRN. The A12 forms a junction with the M25 at Junction 28 to the east and runs towards the A406 North Circular Road as well as east London to the west.

2.27 The A12 is a dual carriageway road which consists of two lanes in each direction to the north of the site. The A12 accommodates an AADF of approximately 50,000 vehicles through Romford in the vicinity of the junction with the A125 and can also be considered to be classified as an UM dual carriageway road.

Existing Traffic Flows (A1112)

2.28 The DfT provides traffic data in the form of Annual Average Daily Flows (AADF) which represents the number of vehicles that drive on a stretch of road on an average day of the year. The A1112 is classified as a Class A Principal Road in an Urban Area and traffic count data is available for a section of the A1112 in the vicinity of the site. The location of the manual count which was used to obtain the traffic data is shown in **Plate 4** below:



Plate 4: A1112 Traffic Count Location (Ref: 71002)

2.29 Traffic count data has been obtained for 2013 which represents the most recent period available. The AADF has been presented by vehicle type and direction in **Table 2.2** below.

Table 2.2: A1112 Annual Average Daily Flows (2013)

Direction	Cars/LGVs	HGVs	Buses	Total
Eastbound	10,406	475	106	10,987
Westbound	10,293	460	101	10,854
Total	20,699	935	207	21,841

2.30 The above shows that the A1112 experiences a two-way flow of 21,841 vehicles across an average day. This consists of approximately 95% motorcycles, cars and LGVs, 4% HGVs and 1% buses. These flows have been converted to peak hour flows based on the assumption that 10% average daily traffic would occur during the average peak hour. This is considered to provide a robust approach, given that each hour represents approximately 4% of the 24hr period. These results are shown in **Table 2.3** below.

Table 2.3: A1112 Peak Hour Flows (2013)

Direction	Cars/LGVs	HGVs	Buses	Total
Eastbound	1,041	48	11	1,099
Westbound	1,029	46	10	1,085
Total	2,070	94	21	2,184

2.31 The A1112 is classified as an urban all-purpose dual carriageway (UAP2), provides two lanes in each direction and has an approximate carriageway width of 7.0m in each direction. However, as the nearside lane cannot be used by general traffic, it is considered that up to 1,600 vehicles could be accommodated within one lane in each direction per hour (see Chapter 3 of DMRB TA 79/99). It is therefore considered that the A1112 currently operates within capacity, with approximately 1,100 vehicles travelling in each direction during the peak hour.

2.32 In light of the above, the surrounding highway network consists of a number of principal routes which are able to cater for large traffic volumes in excess of 20,000 vehicles per day. The A1112 and A1306 run as dual carriageways to the north and south of the site and provide access to other strategic routes including the A125, A13 and the A12. These routes predominantly carry through traffic and provide access to areas within east London as well as towards Kent and Essex.

Initial Accident Review

2.33 An initial review of accidents has been undertaken for the surrounding highway network based on road casualty data available on CrashMap. A summary of the number and severity of incidents which have occurred during the most recently available three year period (2011 to 2013) has been provided in **Tables 2.4** and **2.5** below.

Table 2.4: Accident Data Summary (Links)

Link (excluding junctions below)	Distance	Slight	Serious	Fatal	Total
A1112 (between B178 and A125)	1.0km	11	0	0	11
A125 (north of A1112)	1.0km	5	0	0	5
A125 (between A1112 and Cherry Tree Lane)	0.9km	10	0	0	10
A125 (between Cherry Tree Lane and A1306)	1.0km	6	1	0	7
B178 (between A1112 and A1306)	1.5km	9	0	0	9
A1112 (north of B178)	1.0km	18	3	0	21
A1306 (between B178 and Marsh Way)	1.1km	7	2	0	9
A1306 (between Marsh Way and A125)	1.5km	8	2	0	10
Frederick Road	0.7km	0	1	0	1
Roman Close	0.1km	0	0	0	0
Lowen Road	0.3km	1	0	0	1
Lower Mardyke Avenue	0.5km	0	0	0	0
Total	10.6km	75	9	0	84

Table 2.5: Accident Data Summary (Junctions)

Junction	Slight	Serious	Fatal	Total
Existing Site Access (A1112)	0	0	0	0
A1112/B178	6	0	0	6
A1112/A125	1	0	0	1
A1306/B178	3	1	0	4
A1306/A125	9	0	0	9
A1306/Lower Mardyke Avenue	1	0	0	1
A1306/Marsh Way	9	1	0	10
A125/Cherry Tree Lane	8	0	0	8
Total	37	2	0	39

2.34 The above shows that a total of 123 incidents occurred on the surrounding highway network within a three year period including 84 incidents along links and minor junctions and 39 incidents at major junctions. This is equivalent to approximately 41 incidents

per year (an average of 1-2 incidents per junction per year and 2-3 incidents per kilometre link of highway per year).

2.35 The information presented above indicates that approximately 3-4 incidents occurred per year along the A1112 to the north of the site. This is representative of the incident rates along other surrounding links (such as the A125 and the A1306) and does not appear to be an accident hotspot. Furthermore, no incidents occurred at the existing site access junction with the A1112, or along Lower Mardyke Avenue or Roman Close. This suggests that the highway network in the vicinity of the site's vehicular access points currently operates safely.

2.36 Notwithstanding the above, a more detailed analysis of accident data would need to be undertaken as part of a transport assessment in order to support a detailed planning application. This data would be obtained from Transport for London (TfL) to provide more specific details, such as the nature of the incidents taking place and the types of users involved.

Public Transport

Buses

2.37 The following provides details of the nearest bus stops to the site which are situated to the north on the A1112, as well as to the south on Lower Mardyke Avenue and the A1306 (see **Figure 2** for locations):

- Bus Stop N (bus flag & shelter) - A1112 (westbound) adjacent to the site's northern boundary to the west of the existing access;
- Bus Stop A (bus flag & shelter) – A1112 (eastbound) to the west of the existing access;

- Bus Stop MF (bus flag & shelter) – A1306 (eastbound) approximately 30m to the east of the junction with Lower Mardyke Avenue;
- Bus Stop MC (bus shelter) – A1306 (eastbound) approximately 60m to the east of the junction with Lower Mardyke Avenue;
- Bus Stop MG (bus flag & shelter) – A1306 (westbound) approximately 30m to the west of the junction with Lower Mardyke Avenue; and
- Bus Stop MA (bus flag & shelter) – Lower Mardyke Avenue (southbound) to the south of the site.

2.38 Pedestrians are be able to use the signalised crossing approximately 270m to the west of the existing site access junction to access Bus Stop A on the northern side of the A1112. Pedestrians are also able to use the signalised crossing approximately 10m to the east of the A1306/Lower Mardyke Avenue junction to access Bus Stop MG on the southern side of the A1306.

2.39 **Table 2.6** sets out the bus routes which currently serve the bus stops outlined above, as well as their approximate frequencies.

Table 2.6: Bus Services in the Vicinity of the Site

Service	Route and Direction	Services in Hour Commencing					
		07:00	08:00	09:00	16:00	17:00	18:00
A1112 (EB) - Bus Stop A (York Road)							
103	Chase Cross to Rainham Station	6	6	6	6	6	5
A1112 (WB) - Bus Stop N (York Road)							
103	Rainham Station to Chase Cross	6	6	6	6	6	6
A1306 (EB) - Bus Stop MF (South Street)							
174	Dagnam Park Square to C E M E	7	7	7	7	7	7
287	Barking Station to Abbey Wood Lane	3	4	4	4	4	5
A1306 (WB) - Bus Stop MG (Lower Mardyke Avenue)							
174	C E M E to Dagnam Park Square	7	7	7	7	7	7
287	Abbey Wood Lane to Barking Station	3	4	5	4	4	4
A1306 (EB) - Bus Stop MC (South Street)							
365	South Street to Havering Park	5	5	5	5	5	5
Lower Mardyke Avenue (SB) - Bus Stop MA (Orchard Village)							
365	Havering Park to South Street	4	5	5	5	5	5

2.40 **Table 2.6** shows that the highway network in the vicinity of the site is served by up to 22 buses in each direction per hour.

Rail

2.41 Dagenham East is the nearest London Underground station to the site and is situated within an approximate 1.5km walking distance to the northwest. This station is served by the District Line which runs between Upminster to the east and through east and central London to the west.

2.42 Dagenham Dock is the nearest National Rail station to the site which is situated within an approximate 2.5km walking distance from the

southern boundary of the site at Lower Mardyke Avenue. This station is served by C2C services which run towards London Fenchurch Street, Grays, Pitsea, Southend and Shoeburyness.

- 2.43 Both these stations are outside what the Department for Transport (DfT) and Transport for London (TfL) would consider to be a reasonable walking distance which is set at 960m for sites within London. However, local bus services provide access to both Dagenham East and Dagenham Dock stations and could therefore be used to interchange with these.

Public Transport Accessibility Level

- 2.44 The Public Transport Accessibility Level (PTAL) index adopted by Transport for London (TfL) reflects walking times to public transport facilities, service range and reliability of services for the London area. The index is split into bands summarised by **Table 2.7** below.

Table 2.7: PTAL Rating Description

PTAL Rating	Description
1a-1b	Very Poor
2	Poor
3	Moderate
4	Good
5	Very Good
6a-6b	Central

- 2.45 Site specific PTAL information has been obtained from TfL. The centre of the existing site has a PTAL score of 1b (very poor). Although there are a number of bus services accessible from within a 640m walking distance of the site, there are no underground or

railway services accessible from within a 960m walking distance of the site access. The results of the PTAL output are contained within **Appendix B**.

- 2.46 It is acknowledged that the site currently has a low PTAL score; however, there are proposals to improve the transport infrastructure in the vicinity of the site as part of the London Riverside Opportunity Area (LROA) proposals which are summarised later in **Section 3.0**. Furthermore, approximately 23% residents currently travel by London Underground or train and the PTAL score does not consider the potential for using bus services to interchange with these rail services.

Walking and Cycling

- 2.47 There are footways running along both sides of the A1112 to the north of the site which run between the roundabout junctions with the B178 to the west and the A125 to the east. The footways continue along the A1112 to the north of the B178 roundabout junction towards Dagenham East. There are also footways along the A125 to the east and north of the A1112/A125 roundabout junction.
- 2.48 A signalised pedestrian crossing is present on the A1112 approximately 270m to the west of the existing site access junction. This allows pedestrians to cross between the northern and southern footways and provides access to the bus stops on each side of the carriageway. The existing footway network to the north of the site also allows pedestrians to access Dagenham East London Underground station.
- 2.49 Footways are present on Lower Mardyke Avenue in the vicinity of the turning head to the south of the site. These run southwards towards the signalised junction with the A1306 New Road and allow

pedestrians to access the bus stops along this link as well as the employment and educational opportunities to the south of the site.

- 2.50 Cyclists are currently able to use the bus lanes which run along the A1112 to the north of the site. There are then cycle lanes present along the A1112 to the north of the A1112/B178 roundabout junction. National Cycle Network (NCN) Route 13 runs to the south of the site along the A1306 (New Road) and can be accessed via Lower Mardyke Avenue or Roman Close. NCN Route 136 also runs to the east of the site and passes along a section of the A125 as well as through Hornchurch Country Park. These routes are shown on **Figure 2**.

Local Facilities

- 2.51 There are a range of existing facilities in the vicinity of the site, namely: -
- Open space and sports facilities for recreation including Beam Valley Country Park, Bretons Outdoor Centre and Manor Road Sports Ground;
 - Numerous educational establishments including nurseries and schools, as well as Brittons Academy;
 - Local shops including a newsagents, post offices, restaurants, cafes, pubs/bars, supermarkets and retail outlets;
 - Employment areas including Suttons Business Park to the south;
 - Additional facilities including libraries, police stations, healthcare services, places of worship and community centres;

- Bus stops served by routes providing direct links to South Hornchurch, Rainham, Elm Park, Hornchurch and Romford;
- Dagenham East London Underground station served by the District Line which runs between Upminster to the east and through east and central London to the west; and
- Dagenham Dock and Rainham railway stations served by C2C train services to/from London Fenchurch Street, Grays, Pitsea, Southend and Shoeburyness.

2.52 Further details and a plan showing the location of facilities in the area are contained on **Figure 1**.

Conclusion

2.53 It is considered that the proposals will integrate the site with the surrounding networks and land uses thus minimising walking distances to local services and facilities and reducing the need to travel by vehicular modes. The site is therefore situated in a sustainable location for residential development in accordance with current national government policy set out in the *National Planning Policy Framework* and local policy set out in the *Local Development Framework*. Further details on local policy is contained in the following section.

3.0 LOCAL POLICY AND OPPORTUNITY AREA PROPOSALS

LBH Highways

3.1 Initial discussions have been held with LBH Highways to understand their likely requirements for the site in terms of transport and access on the hypothetical basis that the site will support a residential development with associated uses. A summary has been provided below:

- The design approach for the site should be in accordance with Manual for Streets and should prioritise walking and cycling links;
- The site/proposals should comply with the policies contained within the Local Development Framework (LDF);
- Primary access should be taken from the A1112 to the north to limit the extent of additional traffic on the residential streets to the south;
- Primary access to the north could take the form of one or more junctions depending on the type of arrangement, which may need to be controlled;
- The development should avoid contributing to existing rat running and congestion issues in the area.
- The bus lane along the A1112 should be maintained; and
- A transport assessment would be required to support a planning application for the site/proposals including modelling of key junctions.

3.2 Further more detailed discussions would need to be held with LBH such at a pre-application stage or as a planning application becomes progressed. The site also borders the London Borough of Barking & Dagenham (LBBD) who would also likely need to be consulted.

Local Development Framework

- 3.3 The LDF was adopted by the Council in 2008. Since then, the Government has published its National Planning Policy Framework (NPPF) and the Mayor of London has published a new London Plan (with subsequent alterations). As a result, the Council is currently preparing a new Havering Local Plan which will replace the LDF and cover the period up until 2031.
- 3.4 The LDF continues to guide future planning in the Borough until the emerging Havering Local Plan is adopted. The Core Strategy and Development Control Policies Development Plan Document (DPD) forms the most important LDF document which sets the Council's approach to planning the whole borough up to 2020. The following provides a summary of the Core Policies and Development Control Policies which relate to transport.
- 3.5 **Core Policy (CP) 9 'Reducing the Need to Travel'** states that the need to travel will be reduced by locating major developments in places with good public transport accessibility, relating residential densities to existing and future public transport access levels, ensuring there is a range of local employment opportunities and improving opportunities for informal recreation in the Havering countryside.
- 3.6 **CP10 'Sustainable Transport'** states that sustainable transport will be promoted by:
- Achieving integration between different transport modes;
 - Submitting a travel plan and transport assessment for proposals with material transport implications;
 - Ensuring that new development does not overload the capacity of the public transport and strategic road networks;

- Working in partnership with the relevant agencies to seek funding for and deliver public transport improvements including in the London Riverside Opportunity Area;
- Relating maximum car parking standards to public transport accessibility;
- Minimising the distance to local public transport nodes;
- Increasing accessibility to Romford Town Centre by considering the potential to introduce a Park and Ride facility to encourage modal shift; and
- Seeking contributions for improvements to public transport accessibility and capacity (and other transport improvements).

- 3.7 **Development Control Policy (DC) 32 'The Road Network'** states that new development will not be allowed where it would have an adverse impact on the functioning of the road hierarchy.
- 3.8 **DC33 'Car Parking'** states that car parking provision should not exceed the maximum standards set out in Annex 5.
- 3.9 **DC34 'Walking'** states that developers will be required to take account of the needs of pedestrians and address desire lines to local facilities including schools and public transport nodes. In certain circumstances, contributions may be sought to promote walking in the Borough, pedestrian accessibility towards important local facilities or the pedestrian environment at transport interchanges.
- 3.10 **DC35 'Cycling'** states that developments will need to take account of cyclists by providing safe and secure cycle parking (in accordance with Annex 6) and changing/shower facilities, encouraging access by and circulation of cyclists and providing cycle priority measures where necessary. Contributions may be sought to provide off-site

improvements to the cycle network and cycle facilities including at key public transport nodes.

- 3.11 **DC36 'Servicing'** states that adequate servicing arrangements will need to be provided for new housing developments and should be located within the curtilage of the development where possible, allowing vehicles to leave in forward gear.

LBH Residential Design Supplementary Planning Document

- 3.12 The LBH Residential Design Supplementary Planning Document (SPD) was adopted in 2010 and aims to improve the quality of new residential schemes by providing guidance on how they can be built to a high quality. The document forms part of Havering's LDF and is a material consideration for decisions on planning applications.

- 3.13 One of the main objectives of the document is to promote the accessibility and local permeability of residential developments which can be achieved by meeting the following criteria:

- To be well integrated with surrounding networks, movement patterns and land uses;
- Featuring a network of well-connected streets to improve internal permeability;
- Providing safe and clearly defined pedestrian and cycle routes which follow desire lines to facilitate movement; and
- Prioritising pedestrian and cyclist movements, such as by separating routes and encouraging lower traffic speeds.

- 3.14 In addition to the above, car parking should be well integrated within a development so as not to dominate the landscape and provided in accordance with Development Control Policy DC33.

- 3.15 Cycle parking should be provided in safe, secure and accessible locations and in accordance with Development Control Policy DC35.

- 3.16 Waste and recycling storage should be carefully considered so that they can be easily accessed by both residents and waste/recycling collection vehicles.

London Riverside Opportunity Area

- 3.17 The site is located immediately to the north of the London Riverside Opportunity Area (LROA) which covers 3,000 hectares and extends from the Royal Docks to the west to Rainham Marshes to the east. The LROA encompasses the southern part of the London Borough of Havering, as well as parts of Barking & Dagenham and Newham. The extents of the LROA and how this relates to the site is shown below in **Plate 5**.

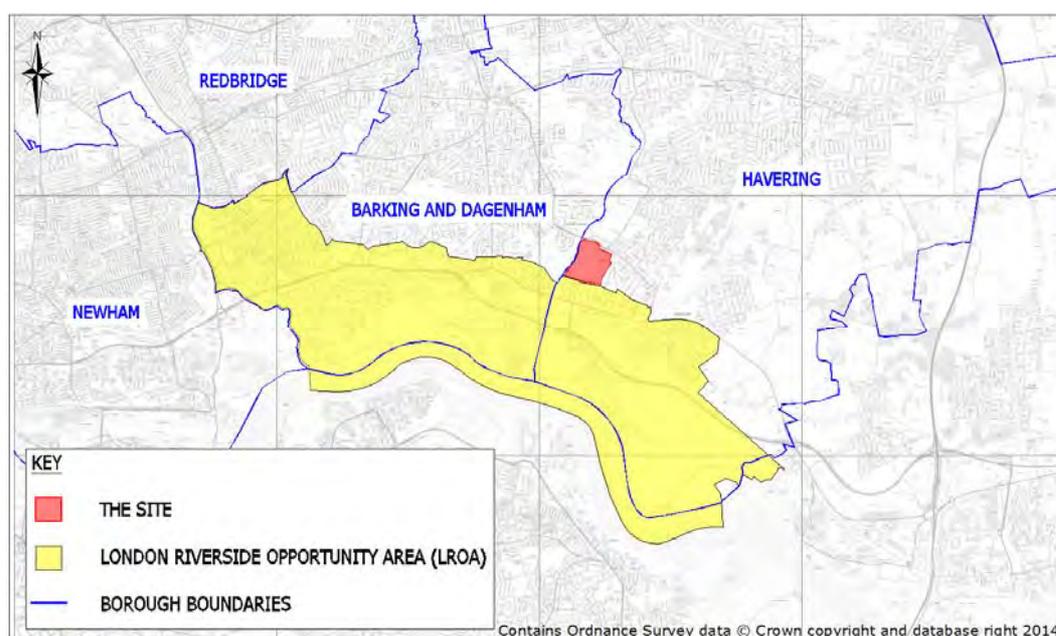


Plate 5: LROA Extents

- 3.18 There are a number of transport improvements proposed within the LROA including improvements to the A13, a new mainline rail station at Beam Park, additional bus corridors/connections and a potential river crossing over the Thames which would be accessed from the A13. These will help facilitate the delivery of new homes and jobs in the area as well as to reduce physical barriers to travel, improve

connections, reduce crowding on public transport and lower highway congestion.

- 3.19 Beam Park station is proposed to be situated between Dagenham Dock and Rainham stations on the Essex Thameside branch of the C2C line. The station would be accessed from Marsh Way to the south of the A1306 (New Road) which would place it within an approximate 800m walking distance of the site's potential southern point of access on Roman Road. Funding is currently being sought for the new station which could open as early as 2020.
- 3.20 Additional bus corridors are sought within the LROA to improve east-west connections across Barking Riverside as well as between Rainham Village and Beam Park. There are also proposals to improve bus connections between the LROA and areas to the north including towards Romford and future Crossrail. The site could facilitate these arrangements by accommodating a bus link in a north-south direction.
- 3.21 There are a number of strategic cycle routes which serve London Riverside including CS3 (Barking to Tower Gateway), LCN13 connecting Rainham with the City, LCN57 linking Dagenham with Epping and LCN58 running between Rainham, Romford and Epping. The proposals would offer the opportunity to link the site with the existing routes nearby and could also potentially provide a cycle route through the site and improve existing cycle facilities along the A1112.

4.0 THE PROPOSED DEVELOPMENT AND LIKELY TRIP GENERATION

4.1 The site consists of approximately 37ha of land and the level of development being considered as part of this appraisal is outlined below: -

- Up to 1,500 residential units;
- Educational facilities including a school;
- Community use;
- Area of public realm;
- Pedestrian and cycle routes; and
- A potential bus link.

4.2 The proposals therefore seek to deliver a residential development with associated employment, educational and recreational facilities which will reduce the need to travel in accordance with LDF Policy CP9. The proposals will focus on delivering pedestrian and cycling routes through the site along key desires lines in accordance with MfS, the Residential Design Guide SPD and LDF Policies DC34 and DC35.

4.3 Plans showing the indicative masterplan for the site are provided in **Appendix C**.

Trip Generation

4.4 All person trip rates have been obtained from the TRICS/TRAVL database for similarly sized mixed use residential developments situated within outer London with low PTAL ratings of 1-2. A total of two sites were selected in total and details of these as well as the trips are contained within **Appendix D**.

4.5 The 2011 Census 'Method of Travel to Work' dataset for the South Hornchurch Ward (where the site is located) has then been used to infer likely resident travel patterns for the proposed development (see **Table 2.1**). A summary of the all person trips rates and anticipated all person trip generation for the proposals (based on the site's area of 37ha) has been provided below in **Table 4.1**.

Table 4.1: Anticipated Development Trip Generation

Proposed Trip Generation	Weekday am peak hour			Weekday pm peak hour		
	<i>In</i>	<i>Out</i>	<i>Two-way</i>	<i>In</i>	<i>Out</i>	<i>Two-way</i>
Person trip rates (per 100sqm)	0.064	0.233	0.297	0.126	0.080	0.207
Person trips (37 ha)	238	861	1099	467	298	764
Vehicle driver trips (54.8%)	130	472	602	256	163	419
Vehicle Passenger trips (4.7%)	11	40	51	22	14	36
Pedal cycle trips (1.3%)	3	11	14	6	4	10
Walk trips (4.2%)	10	36	46	20	13	32
Train trips (10.2%)	24	88	113	48	30	78
Underground trips (12.5%)	30	107	137	58	37	95
Bus trips (9.9%)	24	86	109	46	30	76
Motorcycle Trips (1.0%)	2	9	11	5	3	8
Other trips (1.4%)	3	12	15	6	4	10

4.6 The above shows that the development is projected to generate the highest number of trips during the AM peak period, where approximately 602 two-way vehicular trips are anticipated to occur. Further details of the information obtained from the Census database and the trip generation calculations are held in **Appendices A and D**.

4.7 It should be noted that the site was formerly a landfill site and is currently being restored. As a result, the proposed level of trips shown above will not strictly be all additional. Furthermore, vehicular trips associated with the residential development are likely to consist primarily of light vehicles, rather than the heavy vehicles associated with the site's former use. Nonetheless, for the purposes of this appraisal it has been assumed that the trips shown in **Table**

4.1 would be additional to the network and would consist of 5% HGVs e.g. for deliveries/ servicing movements to provide a worst case assessment.

Vehicle Trip Distribution

4.8 The distribution for the residential element has been derived from 2011 Census Travel to Work Origin-Destination (O-D) data for the resident population of the Havering 028 Middle Layer Super Output Area (MSOA) which covers a smaller area than Ward level and is therefore more specific to the site.

4.9 In the absence of detailed traffic count data, the distribution has only been examined as far as travelling eastbound or westbound along the A1112 to determine the likely level of vehicular trips projected to use this link as well as the two roundabout junctions. The assumptions used to inform the distribution are presented in **Appendix D** and the results are provided below in **Table 4.2**.

Table 4.2: Anticipated Vehicular Trip Distribution

Direction	Junction	Destinations	Proportion
East	A1112/A125	South Hornchurch, Rainham, Romford, Upminster, Thurrock, Brentwood, Basildon, Dartford	63.8%
West	A1112/B178	Barking, Dagenham, Redbridge, Tower Hamlets, Newham, City of London	36.2%

4.10 The above shows that the majority of trips are anticipated to depart/arrive from the east via the A1112 and the A1112/A125 roundabout. These trips will be travelling towards destinations within Havering as well as areas further to the east in Essex and Kent.

Future Development Year

4.11 The 2013 peak hour traffic flows for the A1112 (**Table 2.3**) have been factored up to the future year of 2031 to reflect the end period of the emerging Havering Local Plan. These have been based on growth factors derived from the National Transport Model (NTM) and the National Trip Ends Model (NTEM) using the Trip Ends Model Program (TEMPO). NTM projections for “Urban Principal Roads” in the London were used together with NTEM factors for the Havering (main) area. The obtained growth factors are shown below in **Table 4.3**.

Table 4.3: Growth Factors (2013 to 2031)

Time Period	Growth Factor
AM Peak	1.238
PM Peak	1.243
Average Day	1.256

4.12 The above shows that traffic flows along the A1112 between 2013 and 2031 are anticipated to increase by a factor of 1.238 during the AM peak which represents the worst case period in terms of development trips. In addition, average daily flows are anticipated to increase by a factor of 1.256 which would result in a 2031 AADF of approximately 27,500 vehicles along the A1112.

Traffic Flow Diagrams

4.13 A number of traffic flow diagrams have been put together for the 2013 and 2031 AM peak hour scenarios based on the information provided within this section and **Section 4.0**. The diagrams show the existing and projected levels of traffic anticipated to travel along the A1112 to the east of the proposed site access junction towards the A1112/A125 roundabout and to the west of the proposed site access towards the A1112/B178 roundabout.

4.14 The following scenarios have been examined for the AM peak hour:

- 2013 Existing A1112 Traffic
- 2031 Baseline A1112 Traffic
- Development Traffic Distribution
- Development Traffic Generation
- 2013 With Development Scenario
- 2031 With Development Scenario

4.15 The traffic flow diagrams are contained within **Appendix E**.

Projected Traffic Flow Increase

4.16 The 2013 peak hour traffic flows for the A1112 (see **Table 2.3**) have been compared with the anticipated level of additional traffic which is expected to occur as a result of the proposed development. The AM peak hour has been examined as this represents the period when the proposed development is anticipated to generate the highest level of vehicular trips. The results are shown in **Table 4.4** below.

Table 4.4: 2013 AM Peak Hour Flows

A1112 (East of Access)				
Direction	Existing	Development	Total	% Increase
Eastbound	1,099	307	1,406	28%
Westbound	1,085	84	1,170	8%
Two-Way	2,184	391	2,575	18%
A1112 (West of Access)				
Direction	Existing	Development	Total	% Increase
Eastbound	1,099	48	1,146	4%
Westbound	1,085	174	1,260	16%
Two-Way	2,184	222	2,406	10%

- 4.17 The results for 2031 (which reflects the end period of the emerging Havering Local Plan) have also been calculated for the AM peak hour and are presented in **Table 4.5** below.

Table 4.5: 2031 AM Peak Hour Flows

A1112 (East of Access)				
Direction	Baseline	Development	Total	% Increase
Eastbound	1,360	307	1,667	23%
Westbound	1,343	84	1,427	6%
Two-Way	2,703	391	3,094	14%
A1112 (West of Access)				
Direction	Baseline	Development	Total	% Increase
Eastbound	1,360	48	1,408	4%
Westbound	1,343	174	1,517	13%
Two-Way	2,703	222	2,925	8%

- 4.18 The results show that the proposals are anticipated to increase two-way traffic flows along the A1112 by approximately 14% to the east of the access and 8% to the west of the access in 2031 during the AM peak hour.
- 4.19 Predicted two-way flows on the dual carriageway section of the A1112 to the north of the site are anticipated to reach a maximum of around 3,100 vehicles per hour in 2031. This link has a capacity of approximately 3,200 vehicles per hour, and is therefore projected to almost reach capacity in 2031 with development traffic. The proposed development may therefore be required to contribute towards improvements to the A1112 in the vicinity of the site to increase link capacity and avoid adverse impacts in accordance with LDF Policy DC32.
- 4.20 In addition to the above, it is considered that the A1112/A125 and A1112/B178 roundabout junctions would need to be assessed as part of a detailed planning application for the proposed

development. Further junctions may also need to be assessed including:

- A1306 New Road/Lower Mardyke Avenue 3-arm signalised junction;
- A1306 New Road/Marsh Way 3-arm signalised junction;
- A125 Rainham Road/A1306 New Road 4-arm roundabout;
- A1306 New Road/B178 Ballards Road 4-arm signalised junction;
- A1112 Rainham Road North/A124 Wood Lane 3-arm roundabout; and
- A125 Upper Rainham Road/A124 Hornchurch Road gyratory.

4.21 It should be noted that although the above is considered to provide a robust assessment, the results are based on a number of assumptions and are therefore indicative. A more detailed analysis would need to be undertaken as part of a transport assessment when supporting a planning application to provide more definitive results.

Potential Increase in Public Transport Usage

4.22 The results in **Table 4.1** show that the proposed development is projected to result in an additional 109 bus trips, 137 London Underground trips and 113 rail trips during the AM (worst case) peak hour.

4.23 The site is currently served by up to 22 buses each way per hour, which indicates that approximately 2-3 additional passengers would use each of these services at peak time. However, additional passengers may also use these services to access Dagenham East London Underground station and Dagenham Dock railway station given that these are outside of a reasonable walking distance.

4.24 In light of the above, the additional public transport demand would need to be examined as part of a detailed planning application, particularly in terms of nearby bus stops and Dagenham East London Underground station. The proposals will seek to improve bus services in the area such as by providing a bus link through the site which will help to cater for this additional demand. In addition, the transport improvements proposed as part of the LROA will provide additional capacity on the local public transport network as well as increasing opportunities for residents to access rail and bus services. These factors will therefore also need to be considered.

Travel Plan

4.25 A Travel Plan would need to be implemented in conjunction with any development on the site in order to promote the use of sustainable modes of transport (walking, cycling, public transport and car sharing) by those living there. This would be prepared in accordance with good practice guidelines in force at the time of any planning application submission (such as *TfL's Travel Planning for New Developments in London, November 2013*) and would comprise initiatives such as appointment of a Travel Plan Co-ordinator to promote the existence of the plan and annual monitoring to track progress against mode share targets which would be set.

5.0 VEHICULAR ACCESS OPTIONS TO ACCOMMODATE THE DEVELOPMENT

Opportunities and Constraints

- 5.1 There are a number of opportunities to allow a proposed residential development to be served from the site. The A1112 forms a principal route to the north and is considered appropriate to provide a primary point of access which could be achieved via one or two site access junctions. The site fronts the A1112 for a distance of approximately 350m which provides sufficient scope to provide an access within a location that avoids other junctions and bus stops. It is noted that the majority of traffic needs to access/egress the site to the north and this arrangement would therefore facilitate this.
- 5.2 There are also opportunities to the south in the form of two currently stopped up links which could provide secondary/emergency points of access. Emergency-only access may also be achievable via Frederick Road. It is considered that the site can be well served by the surrounding highway network and that residents would have a number of different options to access/egress the site which would reduce the reliance on any one access point having to be used.
- 5.3 Notwithstanding the above, there are also a number of constraints which need to be considered. In terms of access to the north, the A1112 is currently a dual carriageway, accommodates bus lanes, bus stops and forms other junctions in the vicinity of the site frontage. The A1112 also forms a bend to the east in the vicinity of the A1112/A125 roundabout junction which may reduce visibility upon the approaches to a new junction. These factors will therefore influence any proposed access options e.g. avoiding bus stops and integrating bus lanes where possible.

5.4 The nature of the residential roads to the south limit the amount of additional traffic that could potentially be accommodated. A moderated level of development should therefore be served by any secondary access to the south and a direct link through the site should be avoided to deter rat-running. Roman Close is currently not adopted and Lower Mardyke Avenue would need to be improved/upgraded in the vicinity of the site's southern boundary to facilitate access. This would also be subject to the redline boundary of the site.

Design Requirements

5.5 To determine the appropriate number of accesses and junction type to serve the development the Highway's Agency's Design Manual for Roads and Bridges (DMRB) has been used.

5.6 DMRB is used primarily for the design of trunk and motorways and given the nature of the A1112 which is a principal urban road; DMRB has been adopted as the appropriate guidance to inform this assessment. The assessment used the following chapters from DMRB:

- TD42/95 'Geometric Design of Major/Minor Priority Junctions
- TD16/07 'Geometric Design of Roundabouts'
- TD50/04 'The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts

5.7 Traffic counts undertaken in 2013 were factored to represent a development design year of 2031 (the end year of the Local Plan). The 2031 AADF for the A1112 was estimated at 27,500 vehicles and the two-way peak hour flow was estimated at 2,700 vehicles.

5.8 A trip generation for the proposed development has been undertaken in **Section 4.0** of this report. The trip generation

indicated that the development would generate a two-way peak hour flow of approximately 600 vehicles. The traffic flows can be found in **Appendices D and E**.

Number of Accesses

- 5.9 To serve a development of this size the number of vehicular accesses needs to be carefully considered to suit the requirements of the emergency services as well as to provide good connections to the surrounding highway network.
- 5.10 It is considered that primary means of access would be taken from the A1112 to the north which would ultimately be used to serve the majority of the development. A second point of access could be provided to the south e.g. from Roman Road or Lower Mardyke Avenue to serve a smaller section of the development. An emergency point of access may also be able to be provided from Frederick Road.
- 5.11 Further to the above, there may be potential to provide a second point of access from the A1112 to the north. This option has not however been investigated as part of this initial appraisal. Further details of the access arrangements investigated for the main access on the A1112 are provided in **Section 6.0**.

Types of Access

- 5.12 The Design Manual for Roads and Bridges provides information regarding junction type. Using the traffic flow information and trip generation it is possible to determine the appropriate junction type for the primary access which will serve the proposed development. Where the design year major road flow is above 18,000 vehicles, DMRB TD42/95 suggests a roundabout (or other type) would be required to serve the development.

Access Options

5.13 Based upon the information presented above the following access options have been developed for consideration in this report:

- 1) Single roundabout access to the north with secondary/ emergency access to the south; and
- 2) Single traffic signal access to the north with secondary/ emergency access to the south.

5.14 The secondary/ emergency access could be taken from Roman Close by utilising the existing spur road which partially runs into the site (see **ACE Drawing W420-SK04**). Lower Mardyke Avenue also provides a potential secondary/ emergency access option into the site (see **ACE Drawing W420-SK05A**) subject to the site's redline boundary. Vehicle restriction measures could be implemented to prevent unauthorised access and to control the level of movements generated to the south of the site.

Primary Access Option 1: Single Roundabout

5.15 The roundabout junction has been designed with reference to DMRB TD16/07. Table 6/1 in TD16/07 indicates that a normal roundabout could be provided where flows are less than 16,000 AADT on any approach along a dual carriageway.

5.16 To meet the requirement for entry path deflection and other geometric parameters outlined in TD 16/07, it is considered that the smallest normal roundabout that would be able to be accommodated on the A1112 to support the development would have an Inscribed Circle Diameter (ICD) of approximately 60 metres. Due to the level of traffic passing through the junction, two lane approaches (with a minimum width of 3.0m) have been provided on each arm and the

bus lanes have not been provided through the roundabout to allow general traffic to use both lanes.

- 5.17 Owing to the need to realign the A1112 to achieve adequate deflection at the roundabout (particularly to the west), the most suitable location is in the centre of the site's northern boundary in the vicinity of the existing site access. It should be noted that as this report only provides an initial appraisal, the proposed layout of the roundabout does not currently incorporate the junction with York Road to the west. The potential for accommodating York Road within this type of layout would be investigated as part of a more detailed report such as a transport assessment if the roundabout forms the preferred option.
- 5.18 The proposed roundabout includes a 2.5m segregated cycleway and a 2.0m footway on both sides of the site access arm. Furthermore, 3.0m wide shared cycle/footways have been shown along the eastern and western approaches to the roundabout, as well as around the roundabout. Toucan crossings have been provided on the A1112 arms and an uncontrolled crossing has been provided on the site access arm to allow pedestrians and cyclists to cross.
- 5.19 A plan showing the proposed junction location and arrangement is contained on **ACE Drawing W420-SK02A**.

Primary Access Option 2: Single Traffic Signal Access

- 5.20 The traffic signal junction has been designed with reference to DMRB TD 50/04. The junction has again been located within the centre of the site's northern boundary in the vicinity of the existing site access for the following reasons:
- To ensure appropriate spacing from other junctions e.g. York Road to the west;

- To be situated on a straight section which avoids the bend to the east; and
- To avoid existing bus stops and help link the development with the existing bus stops.

5.21 Due to the level of flow passing through the junction, two lane approaches (with a minimum width of 3.0m) have been provided on each arm and the bus lanes have been removed (through the junction) to allow general traffic to use both lanes. A 3.5m wide right turn lane has been provided on the eastern approach for traffic wishing to turn right into the site from the A1112. This right turn lane is approximately 25m in length in front of the stop line and is therefore able to accommodate a queue of four vehicles.

5.22 The proposed signal junction includes a 2.5m segregated cycleway and a 2.0m footway on both sides of the site access arm. Toucan crossings have then been provided on the site access arm and A1112 eastern arms to allow pedestrians and cyclists to cross between the site and the northern side of the A1112. The proposals also include a 3.0m wide shared cycle/footway along the southern and northern sides of the A1112 which would accommodate both pedestrians and cyclists.

5.23 Keep clear markings have been provided to the west of the proposed signal junction to allow vehicles to turn in/out of York Road. An additional toucan crossing has been provided to the west of the junction with York Road to provide pedestrians and cyclists with an additional opportunity to cross between the northern and southern shared cycle/footways. This will also allow vehicles to turn right into York Road without having to give-way to vehicles travelling eastbound i.e. when the toucan crossing is in use.

5.24 A plan showing the proposed junction location and arrangement is contained on **ACE Drawing W420-SK01A**.

5.25 Details of the proposed staging and phasing for the signal controlled junction are contained within **Appendix G**.

Capacity Assessments

5.26 Junction capacity assessments using the analysis tools ARCADY (for roundabouts) and LINSIG (for the traffic signals) have been undertaken for the two access options outlined above. The 2013 existing year scenario and 2031 future year scenario have been tested for each junction with development traffic applied. The flows have been taken from the traffic flow diagrams contained within **Appendix E** as detailed within the previous section.

5.27 As previously noted, these traffic flows are considered to represent a worst case assessment for the following reasons:

- All vehicular trips have been assumed to be additional to the network i.e. existing trips associated with the site have not been discounted;
- The peak hour flows for the A1112 are based on 10% of the AADF flow which presents a robust methodology;
- The 2031 flows are based on robust growth factors (approximately 24% growth between 2013 and 2031);
- The peak hourly level of development traffic has been considered which occurs during the AM peak (08:00-09:00);
- Delivery/ servicing and potential bus movements have been considered i.e. 5% development has been shown as HGVs;
- The majority of development traffic (63%) has been assumed to turn right out of the site; and
- All development traffic has been applied to the main access on the A1112, despite an alternative access being available to the south which would serve part of the development.

Option 1 - ARCADY Assessment

- 5.28 Junction capacity assessments have been undertaken for the proposed roundabout option for the 2013 and 2031 with development scenarios using ARCADY 8. An RFC of 0.85 or higher is generally considered to demonstrate that practical capacity has been reached.
- 5.29 The ARCADY model includes crossings on each of the arms and to further ensure that the modelling is robust, it has been assumed that 60 two-way pedestrian movements would be made during the peak hour. This represents the combined level of pedestrian and cycle trips that are anticipated to be generated by the proposed development during the AM peak as outlined in **Table 4.1**. A total of 60 two-way movements have been shown to cross the site access arm, and 30 two-way movements have been shown to cross the A1112 arms.
- 5.30 Further to the above, it has been assumed that 5% of all movements would consist of HGVs including those associated with the site. The three crossings have all been modelled as toucan crossings (including across the site access for robustness) to consider delay associated with pedestrians and cyclist movements at this junction.
- 5.31 The results of the ARCADY assessments are presented in **Table 5.1** below.

Table 5.1: ARCADY Results for Roundabout Option

Junction Arm	AM Peak Hour (Worst Case)			
	2013 Existing Flows + Dev		2031 Base Flows + Dev	
	Max RFC	Max Queue	Max RFC	Max Queue
A1112 (E)	0.634	2	0.763	4
Site Access (S)	0.442	1	0.508	2
A1112 (W)	0.696	3	0.839	6

5.32 The results presented in **Table 5.1** indicate that the normal roundabout operates within capacity during the 2013 and 2031 development year scenarios. However, the roundabout is shown to operate very close to capacity during the 2031 peak hour scenario, with a maximum RFC of 0.839 on the A1112 (W) arm where a maximum queue of six vehicles is anticipated to form.

5.33 In light of the above, the layout/ geometry of the A1112 western arm may need to be amended to provide additional capacity as part of any further assessments should a normal roundabout form the preferred option. The full ARCADY output data can be found in **Appendix F**.

Option 2 - LINSIG Assessment

5.34 Junction capacity assessments have been undertaken for the proposed signal controlled option for the 2013 and 2031 with development scenarios using the analysis tool LINSIG 3.

5.35 A Degree of Saturation (DoS) of 90% is considered to demonstrate that practical capacity has been reached for a given arm. A DoS of 100% or above indicates that the ultimate capacity has been reached (or exceeded).

5.36 In terms of the operation of the junction as a whole, the Practical Reserve Capacity (PRC) identifies the additional capacity that could

theoretically be accommodated. A negative PRC suggests that the junction is projected to operate over capacity.

- 5.37 The LINSIG model includes the priority junction with York Road to the west of the proposed signal controlled site access junction, as well as the proposed toucan crossing on the A1112 further to the west. The movements in/out of York Road have been shown to give-way where necessary and it has been assumed that 60 two-way movements (30 in, 30 out) would be made during the peak hour.
- 5.38 The traffic flows have been inputted as Passenger Car Units (PCUs) based on the flows shown on the traffic flow diagrams in **Appendix E**. It has also been assumed that several routes along the A1112 would only be used by buses, taxis and motorcyclists due to the bus lanes which are present on the junction approaches. For the purposes of this assessment, it has been assumed that these routes would be used by six buses in each direction per hour (equivalent to 12 PCUs) based on the frequency of bus service 103, as well as 5% of light vehicles e.g. taxis and motorcyclists.
- 5.39 **Table 5.2** provides a summary of the LINSIG output for the development scenarios.

Table 5.2: LINSIG Results for Signal Controlled Option

Junction Arm	AM Peak Hour (Worst Case)					
	2013 Existing Flows + Dev			2031 Base Flows + Dev		
	DoS	Max Mean Queue (PCUs)	Total Delay (PCUs/hr)	DoS	Max Mean Queue (PCUs)	Total Delay (PCUs/hr)
A1112 East	64.4%	17.3	5.1	71.8%	21.3	6.1
Site Access	70.4%	10.9	4.8	84.5%	12.8	6.6
A1112 West	57.6%	11.4	4.0	65.3%	13.9	4.5
York Road (Entry)	4.2%	0.0	0.0	5.2%	0.5	0.3
York Road (Exit)	9.4%	0.3	0.1	12.1%	0.9	0.4
Total Junction	PRC 27.4%	Total Delay (PCU/hr) 32.42		PRC 5.5%	Total Delay (PCU/hr) 45.85	

- 5.40 The LINSIG output shows that the junction operates within capacity during the 2013 and 2031 with development scenarios. Again, the junction is shown to approach capacity during the 2031 peak hour scenario with a maximum Degree of Saturation of 84.5% anticipated to occur on the site access arm. The junction is however anticipated to have a Practical Reserve Capacity of 5.5% indicating that some additional capacity may be available.
- 5.41 Nonetheless, the layout of this junction or signal staging/ phasing may need to be amended to provide additional capacity as part of any further assessments should a signal controlled junction form the preferred option. The full LINSIG output data including the anticipated phasing and staging arrangements can be found in **Appendix G**.

Discussion

- 5.42 Modelling has been undertaken for the two access options which indicate that both junction arrangements are projected to operate within capacity during the 2013 and 2031 development scenarios for the worst case hour. The signal controlled junction is shown to operate further within its capacity limits than the roundabout option and may therefore offer a more long-term solution in terms of providing access in/out of the site.
- 5.43 The proposed signal controlled junction may also be considered to offer the preferred option as it would require less land take than the normal roundabout and would not require the A1112 to be realigned to the south. However, it is considered that further investigation would be needed as part of a more detailed transport assessment to provide more definitive results i.e. based on traffic counts undertaken during the peak hours.

- 5.44 Further to the above, there could be potential to provide a second point of access onto the A1112 to the north of the site. This may help to relieve any potential pressures that may arise from having just one access point to the north by providing residents with an alternative option to access the strategic highway network. Again, this would require further investigation.

6.0 INTERNAL DESIGN AND OFF-SITE CONSIDERATIONS

Vehicular Access

- 6.1 The main point of vehicular access will be taken from the A1112 to the north in accordance with LBH Highways' initial views. This point of access would serve the majority of the development and could take the form of a loop-type arrangement. The internal road layout should be designed in accordance with MfS to cater for the anticipated vehicular demand depending on the number of units served. Direct vehicular routes would be avoided to deter rat-running through the site.
- 6.2 The vehicular routes through the site would need to cater for servicing and emergency vehicles. Refuse vehicles would need to be able to access bin stores from within an appropriate distance. Internal turning heads may also need to be provided to cater for the movements of refuse vehicles and fire tenders and to avoid these vehicles reversing for long distances. Swept paths should be undertaken to inform the design to ensure these larger vehicles would be able to manoeuvre through the site. Loading facilities may also need to be provided.
- 6.3 It is considered that a smaller portion of the development could be served from a southern point of access. This could take the form of a priority junction with Roman Close (see **ACE Drawing W420-SK04**) or Lower Mardyke Avenue (see **ACE Drawing W420-SK05A**) and would need to serve an appropriate level of development so as not to increase traffic levels beyond acceptable levels. This area has recently been improved and redeveloped as part of the Orchard Village development and further improvements could be made if needed to facilitate access in/out of the site, such as for a potential bus link.

- 6.4 There may also be potential to provide an emergency-only access link through the southeastern corner of the site via Frederick Road between residential properties 50 and 52. A footway currently runs between the properties which is stopped-up by bollards at Frederick Road to prevent vehicular access. There is an approximate minimum width of 4.1m at this location and it is therefore considered that this option would only be suitable for providing emergency access, rather than forming a potential secondary point of access. The emergency link could take the form of a stopped-up shared access road to provide access to pedestrians and cyclists.
- 6.5 The potential primary, secondary and emergency points of access are illustrated on the indicative masterplan plans contained within **Appendix C**.

Pedestrian and Cycle Links

- 6.6 The proposals will form connections with the existing pedestrian and cycle networks in the area. The existing footways along the A1112 could be upgraded to shared cycle/footways to accommodate both pedestrians and cyclists. Toucan crossings could also be provided on the A1112 in the vicinity of the site to provide pedestrians and cyclists with increased opportunities to access both sides of the carriageway. These could be integrated as part of the proposed A1112/site access junction (see **Section 5.0** for further details).
- 6.7 Additional pedestrian and cycle links could be provided at the proposed southern access point(s) on Roman Road and Lower Mardyke Avenue, as well as via Frederick Road (between properties 50 and 52) using the existing footway/ or a potential shared emergency link. This would allow the site to be easily accessed on-foot and by bicycle from the south and east, as well as to the north via the main site access. The main internal site access roads will feature footways on both sides to facilitate pedestrian movements through the site and along key desire lines.

- 6.8 The proposals could provide a segregated cycleway through the site in a north-south direction. This would link the existing cycle routes along the A1112 to the north and the A1306 to the south and would therefore improve connections and the accessibility of the site for cyclists. This would also provide residents with additional opportunities to cycle, helping to increase the low proportion of residents (1.3%) that currently travel by this mode.

Bus Link

- 6.9 The proposals could incorporate a bus link which would run through the site between the A1112 to the north and one of the potential southern accesses to the south. Bus routes would then be able to make use of Lowen Road and Lower Mardyke Avenue to access the A1306 to the south, under the same arrangement as existing bus route 365. There are currently four bus routes which run in the vicinity of the site which may potentially be able to make use of such a link. These existing bus routes are shown on **Figure 2**.
- 6.10 The bus link would need to be able to sufficiently cater for bus movements and swept paths could be used to inform the design. A bus gate restriction could be provided within the site to prioritise buses and control general access at a specific location. This would reduce bus journey times and increase the attractiveness of this mode of travel. Pedestrian and cyclist movements could also be facilitated by this type of arrangement. An indicative bus gateway restriction arrangement is provided within **ACE Drawing W420-SK03**.
- 6.11 Bus routes 174 and 365 currently start in the vicinity of the site to the south and run along the A1306 to/from Dagenham, Hornchurch, Romford, Gidea Park, Collier Row and Harold Hill. It is considered that these routes could be extended so that they start/end within the site to allow these services to be more easily accessed by residents. This would provide residents with easy access to

approximately 11-12 bus services per hour (every five minutes) in each direction. It should be noted that the journey times between existing destinations would be unaffected given that the extension would be at the start/end of the route(s).

- 6.12 Bus route 287 also runs along the A1306 to the south of the site and provides a direct link between Rainham and Dagenham. An initial appraisal of this route suggests that there may be limited potential to divert/extend this route through the site due to the additional journey time this would incur for existing users. However, the route could be diverted to serve the site (as well as existing residents within South Hornchurch) by running along the A1112 and then turning left into the site to travel southwards back towards the A1306.
- 6.13 Bus route 103 runs along the A1112 to the north of the site between Rainham and Romford. As this route currently serves the bus stops situated on the A1112 in the vicinity of the site, diverting the route may provide limited benefit. The proposals will offer the opportunity to improve crossing facilities on the A1112 to improve the accessibility of these existing bus stops.
- 6.14 New high quality bus stops with shelters, seating and raised kerbs could be provided within the site to facilitate passenger boarding/alighting. It is considered that up to four bus stops (two in each direction) could be provided to allow residents to be within an easy walking distance of either pair of stops.
- 6.15 The potential bus link would improve north-south bus connections in line with the aspirations of the LROA proposals. The proposed development could also potentially offer contributions to improving existing bus stops in the area such as those along the A1112 in the vicinity of the site.

Car Parking Provision

6.16 The LBH Car Parking Standards are contained within Annex 5 of the *Core Strategy and Development Control Policies Development Plan Document (DPD)* and are based on those provided in the London Plan. As the proposed development will be predominantly residential, the car parking standards have been examined for C3 Dwelling Houses. These are based on a density matrix as presented below in **Table 6.1**.

Table 6.1: LBH Maximum Car Parking Standards

Predominant Housing Type	Maximum Car Parking Provision	
Detached, Semi-Detached and Terraced Houses and Flats	High	1.5-2 spaces per unit
Terraced Houses and Flats	Medium	1-1.5 spaces per unit
Mostly Flats	Low	<1 space per unit

6.17 **Table 6.1** shows that a parking provision of 1-1.5 spaces per unit would be appropriate for a large residential development consisting of a mixture of housing and flats. This equates to between 1,500 and 2,250 parking bays for a site consisting of 1,500 residential units.

6.18 In terms of motorcycle parking, one space should be provided per 20 car parking spaces, with a minimum of one space being provided for developments with more than ten car parking spaces.

6.19 Parking bays associated with Wheelchair Housing should be designed in accordance with the Wheelchair Housing Design Guide. Blue Badge holders should be able to park to easily use the development.

Cycle Parking Provision

6.20 The LBH Cycle Parking Standards are contained within Annex 6 of the *Core Strategy and Development Control Policies Development Plan Document (DPD)* and are in line with TfL's standards. The minimum requirement for C3 Dwelling Houses is provided below in **Table 6.2**.

Table 6.2: LBH Minimum Cycle Parking Standards

Housing Type	Minimum Cycle Parking Provision
Flats	1 space per unit
Dwelling Houses	1 space per 1 or 2 bedroom dwelling
	2 spaces per 3+ bedroom dwelling
Sheltered Accommodation	1 space per 450sqm

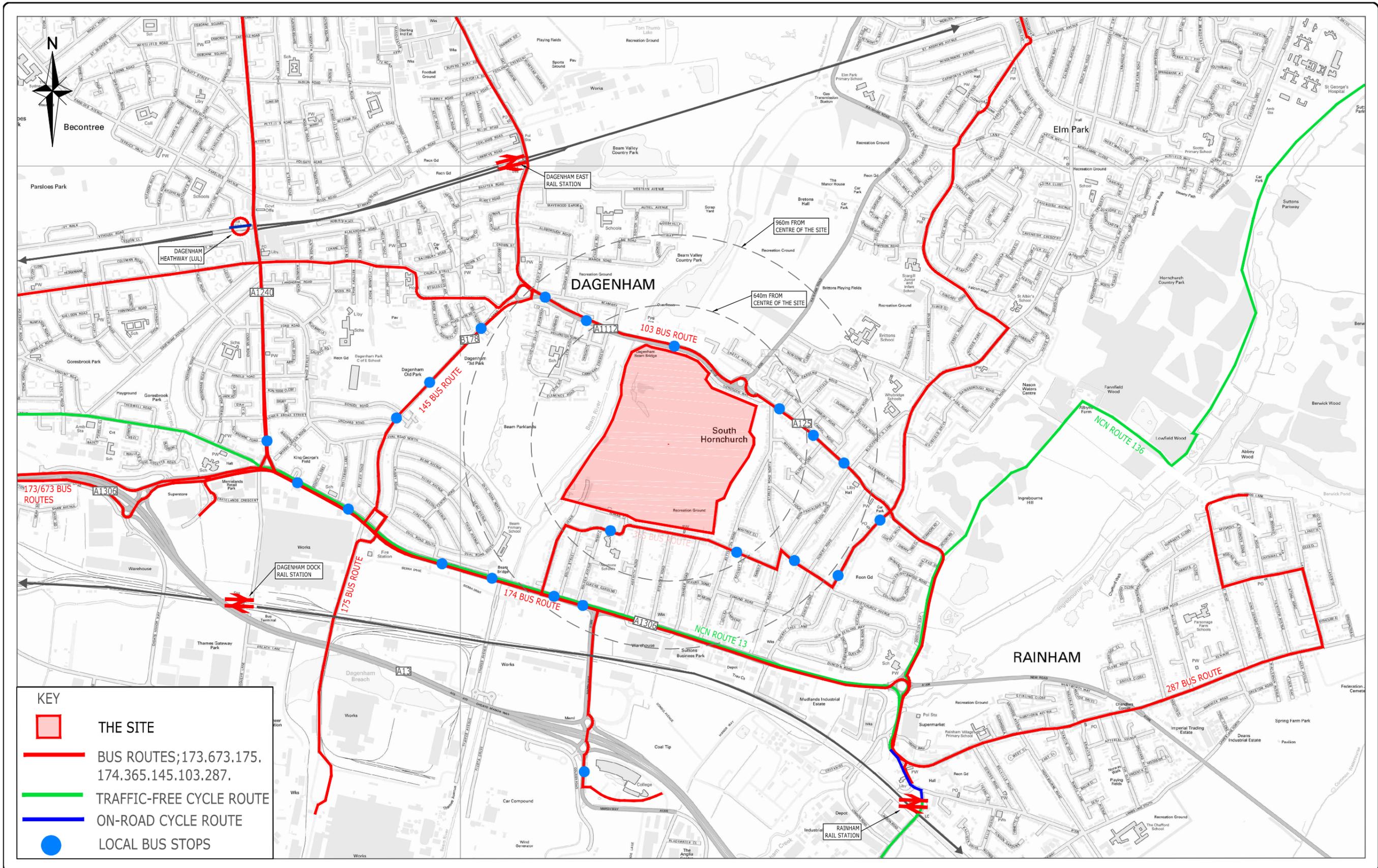
6.21 The above shows that one cycle space should be provided per flat or one or two bedroom dwelling, whereas two cycle spaces should be provided for dwellings with three or more bedrooms. The proposed development would therefore accord to this standard.

7.0 BENEFITS OF THE DEVELOPMENT

- 7.1 The site is well positioned in relation to the surrounding area which consists of a variety of residential, employment, open space/recreational, educational and retail uses. The A1112 runs to the north of the site and there are a number of bus stops situated close by. The public transport accessibility of the site will improve in the future as part of the LROA proposals.
- 7.2 The proposals will seek to provide additional opportunities for walking and cycling routes through the site which will create and serve key desire lines between the north and the south. These routes would provide connections with existing pedestrian and cycle routes thereby integrating the site with the surrounding area. Additional crossing facilities could be provided on the A1112 to benefit pedestrians and cyclists, and existing routes could be upgraded such as providing shared cycle/footways along both sides of the A1112. Cycle parking will be provided in accordance with the standards in safe, secure and accessible locations.
- 7.3 The proposals will offer the opportunity to provide a bus link through the site to further improve accessibility by public transport. New bus stops would be provided as part of this arrangement to minimise walking distances. The bus link would improve connections to key public transport interchanges such as Dagenham East London Underground station allowing existing bus services to be better integrated.
- 7.4 The development would likely best be served by a primary access point to the north and secondary/ emergency points of access to the south. These arrangements would be designed to limit the extent of additional traffic on the residential streets to the south and to allow servicing vehicles to access the site, serve the development and exit in forward gear. Car parking will be well integrated and also provided in accordance with the appropriate standards.

- 7.5 The LROA is situated immediately to the south of the site and the proposals have the potential to improve the accessibility of the site particularly by rail and by bus. However, the proposed transport improvements require funding to be secured to allow them to come into fruition. The proposed development will not only reduce north-south barriers and improve local bus connections, but will offer the opportunity to provide contributions towards the LROA proposals. It is therefore considered that the proposed development of the site and LROA will be of mutual benefit to one another.
- 7.6 The proposed development would also offer the opportunity to provide additional improvements to the surrounding area. This could be in the form of improved pedestrian/cycle facilities along the A1112 and additional/improved bus stops and connections. These improvements will complement those being provided as part of the Orchard Village development to the south which will also be of benefit to the site.
- 7.7 A Transport Assessment and Travel Plan would need to be produced as part of any planning application at the site. These reports would provide further details of the likely impacts of the proposals on the public transport system and strategic highway network, as well as how these could be mitigated and additional transport improvements which could be put in place.
- 7.8 In light of the above, it is considered that a proposed residential development at the site with associated employment, educational and recreational facilities would offer a wide variety of benefits to the surrounding area. The potential development is considered to be in accordance with local transport policies detailed within the LDF and a transport assessment and travel plan would be produced as part of any planning application to further comply with these. The proposals will increase the opportunity for the proposed LROA transport improvements to be delivered by improving connections and offering potential contributions.

Figures



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PROJECT TITLE:
Mardyke Farm

DRAWING TITLE:
Public Transport and Cycle Route Plan

CLIENT:
Barratt London

SCALE: NTS@A3	DATE: Feb 2015	DESIGNED: MJR
DRAWN: MJR	CHECKED: CB	APPROVED: SJH
DRAWING NO.	Figure 2	REV: -

Drawings

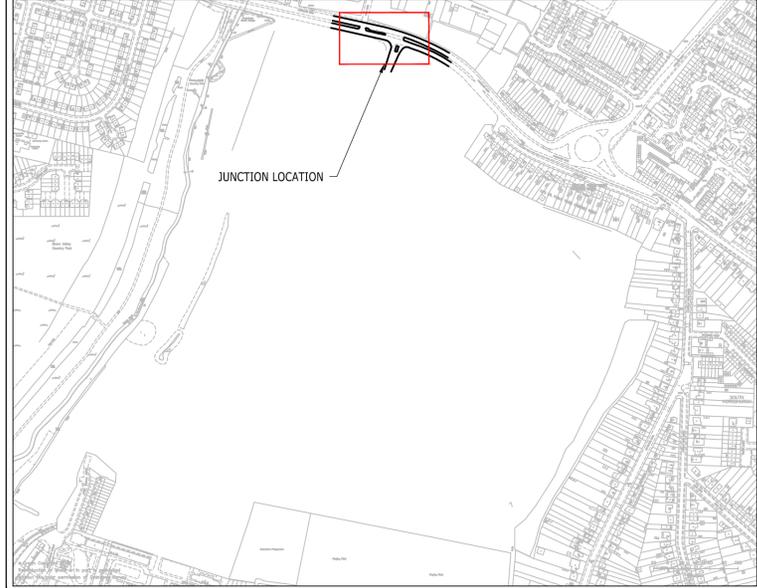


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 5. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 6. SUBJECT TO DETAILED CAPACITY ASSESSMENT

- KEY
- PROPOSED CARRIAGEWAY
 - PROPOSED FOOTWAY
 - PROPOSED VERGE
 - PROPOSED ISLAND / HARDSTANDING
 - BUS LANE
 - JUNCTION INTERVISIBILITY

ISSUE FOR INFORMATION ONLY

KEY PLAN - 1:5000



REV AMENDMENTS	DRN	CHK	APP	DATE
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CLIENT: **BARRATT LONDON**

PROJECT TITLE: **MARDYKE FARM, SOUTH HORNCHURCH**

DRAWING TITLE: **SITE ACCESS OPTION SIGNALISED JUNCTION**

AI SCALE: 1:250	DATE: FEB 2015	DESIGNED: DE	
DRAWN: DE	CHECKED: SH	APPROVED: CBP	
DRAWING NO. W420 - SK01			REV: A



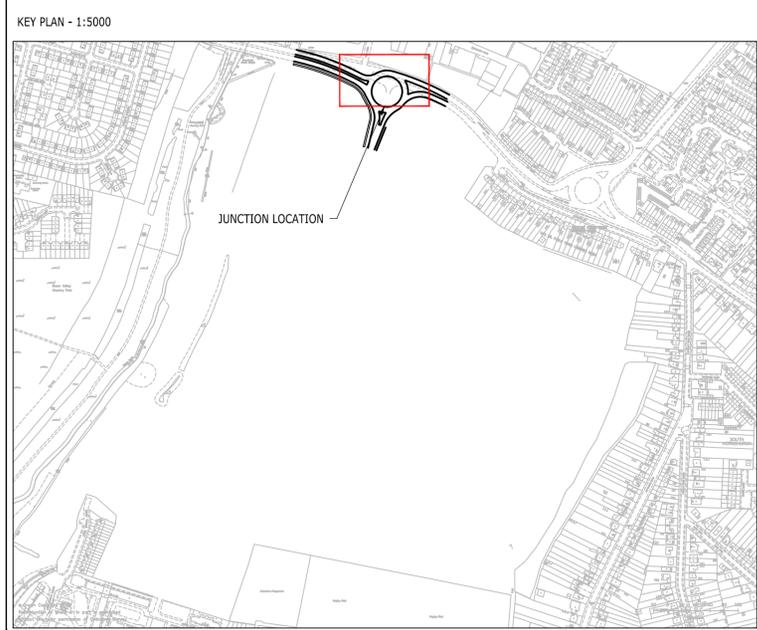
- NOTE:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
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 5. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 6. SUBJECT TO DETAILED CAPACITY ASSESSMENT

KEY

	PROPOSED CARRIAGEWAY
	PROPOSED FOOTWAY
	PROPOSED VERGE
	PROPOSED ISLAND / HARDSTANDING
	BUS LANE

ISSUE FOR INFORMATION ONLY

A	FLARES TO EASTBOUND AND WESTBOUND ENTRIES ADDED	DE	SH	CBP	04.03.15
REV	AMENDMENTS	DRN	CHK	APP	DATE



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CLIENT:	BARRATT LONDON		
PROJECT TITLE:	MARDYKE FARM, SOUTH HORNCHURCH		
DRAWING TITLE:	SITE ACCESS OPTION 60m ICD ROUNDABOUT		
AI SCALE:	DATE:	DESIGNED:	
1:500	FEB 2015	DE	
DRAWN:	CHECKED:	APPROVED:	
DE	SH	CBP	
DRAWING NO.:	REV:		
W420 - SK02	A		



DIAG 953
'BUS AND CYCLES ONLY'
SIGN TOP BE MOUNTED ON POST



DIAG 953
'BUS AND CYCLES ONLY'
SIGN TOP BE MOUNTED ON POST

REFLECTIVE LOW
LEVEL BOLLARDS

RAISED LEVEL SURFACE
TO ENHANCE PEDESTRIAN
CONNECTIVITY



DIAG 616
'NO ENTRY'
SIGN TOP BE MOUNTED ON POST



DIAG 616
'NO ENTRY'
SIGN TOP BE MOUNTED ON POST

NOTES:

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NOTE

OTHER OPTIONS INCLUDE;

- RISING BOLLARDS,
- AND CAMERA ENFORCEMENT

BOTH WILL HAVE HIGHER COST TO
INSTALL AND ONGOING MAINTENANCE

ISSUE FOR
INFORMATION ONLY

REV	AMENDMENTS	DRN	CHK	APP	DATE
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PROJECT TITLE:
**MARDYKE FARM,
SOUTH HORNCURCH**

DRAWING TITLE:
**INDICATIVE BUS GATEWAY
RESTRICTION**

CLIENT:
**BARRATT
LONDON**

A3 SCALE: 1:200	DATE: FEB 2015	DESIGNED: DE
DRAWN: DE	CHECKED: SH	APPROVED: CBP
DRAWING NO. W420 - SK03		REV: -



CONSIDERATION TO BE MADE TO
INSTALL VEHICLE RESTRICTION
MEASURE TO PREVENT
UNAUTHORISED ACCESS

EMERGENCY ACCESS TO USE
EXISTING CARRIAGEWAY TO
CONTINUE INTO SITE

ROMAN CLOSE

NOTES:

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INFORMATION ONLY

REV	AMENDMENTS	DRN	CHK	APP	DATE

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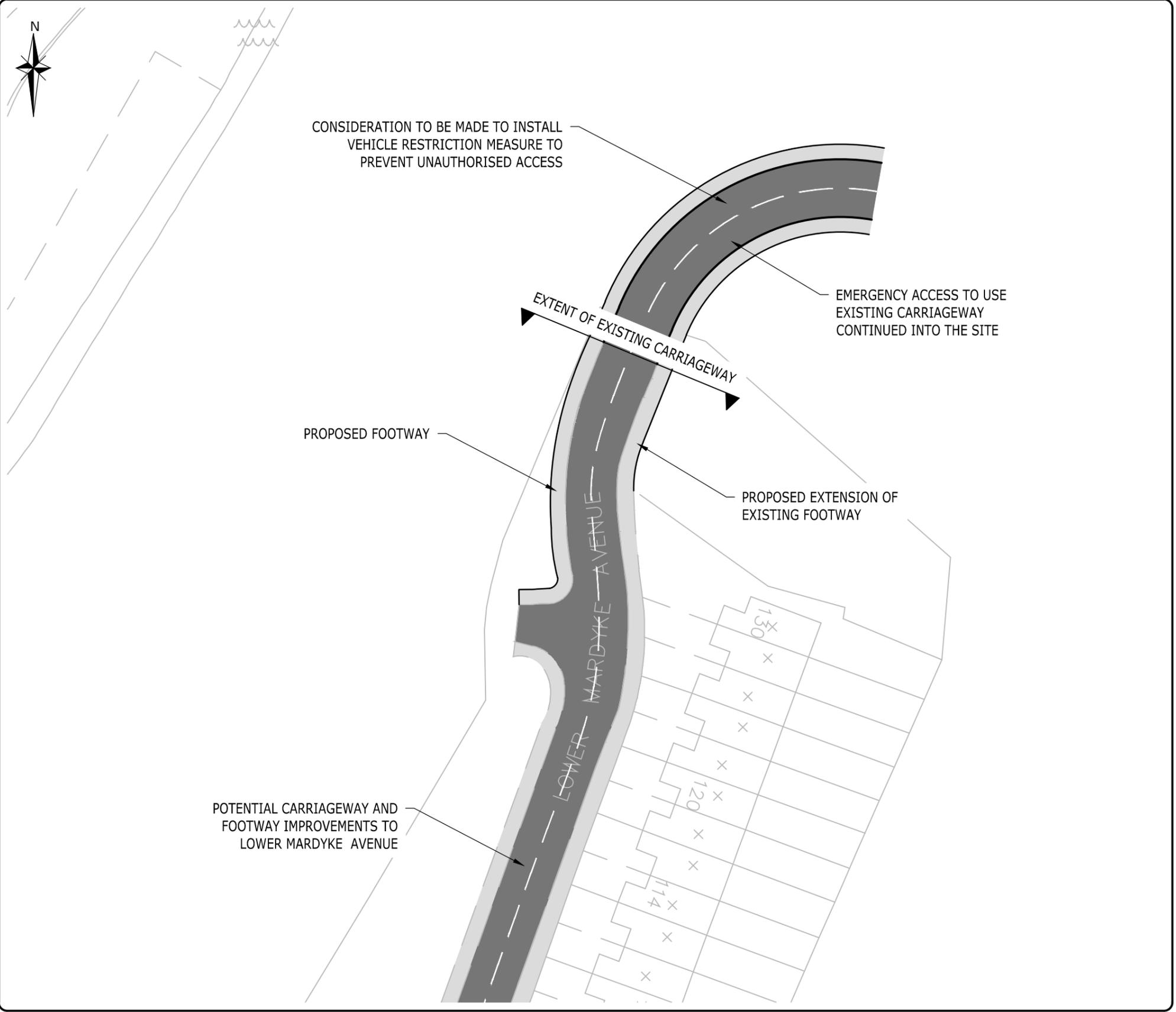


PROJECT TITLE:
**MARDYKE FARM,
SOUTH HORNCURCH**

DRAWING TITLE:
**INDICATIVE SOUTHERN
ACCESS (EMERGENCY ACCESS)**

CLIENT:
**BARRATT
LONDON**

A3 SCALE: 1:200	DATE: FEB 2015	DESIGNED: DE
DRAWN: DE	CHECKED: SH	APPROVED: CBP
DRAWING NO. W420 - SK04		REV: -



- NOTES:**
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 5. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 6. ALIGNMENT OF INTERNAL ACCESS ROAD SUBJECT TO REDLINE BOUNDARY AND HIGHWAY LAND SEARCH.

ISSUE FOR INFORMATION ONLY

REV	AMENDMENTS	DRN	CHK	APP	DATE
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ISO 9001
 BUREAU VERITAS
 Certification

PROJECT TITLE:
**MARDYKE FARM,
 SOUTH HORNCURCH**

DRAWING TITLE:
**ALTERNATIVE INDICATIVE SOUTHERN
 ACCESS (EMERGENCY ACCESS)**

CLIENT:
**BARRATT
 LONDON**

A3 SCALE: 1:200 @ A3	DATE: FEB 2015	DESIGNED: DV
DRAWN: DV	CHECKED: CB	APPROVED: CBP
DRAWING NO. W420 - SK05		REV: A

Appendix A
Census Travel to Work Data

Method of Travel to Work (QS701EW)

			South Hornchurch Ward	Havering London Borough	London Region	England Country	
All Usual R	Count	Persons	Mar-11	9591	171128	6117482	38881374
Work Main	Count	Persons	Mar-11	156	4038	202679	1349568
Undergrou	Count	Persons	Mar-11	742	10763	902263	1027625
Train	Count	Persons	Mar-11	610	20347	532720	1343684
Bus, Minib	Count	Persons	Mar-11	592	8711	561605	1886539
Taxi	Count	Persons	Mar-11	47	1216	20314	131465
Motorcycl	Count	Persons	Mar-11	62	1016	45976	206550
Driving a C	Count	Persons	Mar-11	3263	54368	1120826	14345882
Passenger	Count	Persons	Mar-11	277	3642	69659	1264553
Bicycle	Count	Persons	Mar-11	75	1020	161705	742675
On Foot	Count	Persons	Mar-11	251	7080	352612	2701453
Other Metl	Count	Persons	Mar-11	34	645	28538	162727
Not in Emp	Count	Persons	Mar-11	3482	58282	2118585	13718653

Method of LastUpdate: 30-Jan-13

Method of Source: Office for National Statistics

Method of National Statistics

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Appendix B
PTAL Calculations

PTAI Study Report File Details

Date 27/02/2015 09:15

Day of week M-F

Time period AM peak

Walk speed 4.8 kph

Walk file PLSQLTest

POI Name: 551027, 183691

Bus Services

Reliability factor for this mode is 2

Maximum walk time for this mode is 8 minutes

Maximum walk distance for this mode is 640.0 metres

Stop DAGENHAM RD BEAM BRIDGE

Walk time to stop from POI is 4.91 minutes

Walk distance to stop from POI is 393.04 metres

Route 103 Direction OUT Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction BACK Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction BACK Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction OUT Frequency 6.0 giving AWT of 5.0 minutes

Stop DAGENHAM RD RAINHAM RD

Walk time to stop from POI is 2.63 minutes

Walk distance to stop from POI is 210.19 metres

Route 103 Direction OUT Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction BACK Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction BACK Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction OUT Frequency 6.0 giving AWT of 5.0 minutes

Stop RAINHAM RD FYFIELD RD

Walk time to stop from POI is 5.69 minutes

Walk distance to stop from POI is 455.49 metres

Route 103 Direction OUT Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction BACK Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction BACK Frequency 6.0 giving AWT of 5.0 minutes

Route 103 Direction OUT Frequency 6.0 giving AWT of 5.0 minutes

TATs for this mode

Route 103 Stop DAGENHAM RD RAINHAM RD TAT 9.63 minutes EDF 3.12

Best EDF is 3.12

Half of all other EDFs is 0.0

AI for this mode is 3.12

Underground Services

Reliability factor for this mode is .75

Maximum walk time for this mode is 12 minutes

Maximum walk distance for this mode is 960.0 metres

** No stops found within buffer for this POI

Rail Services

Reliability factor for this mode is .75

Maximum walk time for this mode is 12 minutes

Maximum walk distance for this mode is 960.0 metres

** No stops found within buffer for this POI

Total AI for this POI is 3.12. X: 551027, Y: 183691.

PTAL Rating is 1b.

Appendix C
Indicative Masterplan Plans

Illustrative Masterplan

The Mardyke Farm neighbourhood has been designed with nature and ecology at the forefront, with a 4 hectare village green at the centre, an 8 hectare ecological buffer around the edge towards existing properties, 4 hectares of play/sports fields and a series of smaller pocket parks interwoven into the residential grain. All to maximise green space and to protect and enhance site ecology.

Shaped by the topography of the site, our masterplan provide up to 1,500 homes, a primary or secondary school, and space for shops, business and community facilities in the Mardyke Farm pavilion on the village green.

NUMBER OF HOMES

Houses: 250
Maisonettes :350
Duplexes: 250
Apartments: 650

TOTAL: 1,500 homes



0 200m

Principle 3

A Central Spine for Walking, Cycling, Cars and Buses

A central spine connects the site with the surrounding area, bridging boundaries and inviting people in. We see this as a slow, pedestrian priority route for cars with the potential for an extended/new bus service.

A majority of vehicles would access the site from the north, whilst the southern access would service around 100 homes. A bus gate would limit through traffic to buses only.

A dedicated cycle lane runs the full length of the spine, linking to the Sustrans National Route 13 along New Road (A1306).

Bus stops are strategically located near key points of attraction: the play/sports fields to the south, the Village Green at the centre, and the main entry to the north.

A secondary perimeter route runs along the ecological buffer. We promote this as a shared surface street where cars slow down and cyclists and pedestrians take priority.



Principle 9

A Network of Green Walkways and Cycleways

Green space is maximised on site to create a sense of houses in landscape, and to reinstate a strong connection to the Beam Valley Country Park.

Apart from the dedicated cycle lane, walking and cycling is encouraged through an extensive network of green routes that permeates the residential grain and extend into the neighbouring parkland to connect with existing trails and paths.

Pedestrian priority play streets are provided within the residential neighbourhood, linking with the central spine, to ensure the site is permeable and accessible.

A raised boardwalk within the ecological buffer makes this biodiverse environment accessible to people in a controlled way. A north-south boardwalk extends the western site boundary, weaving and meandering across the landscape, rising gently at the centre of the site to circumvent the village green.



Principle 10

Integrated Car Parking

Although significant public transport upgrades are on the agenda, the site's low PTAL rating (1-2) means that sufficient car parking standards are required.

Along the Beam Valley Country Park edge, undercroft car parking facilities are seamlessly integrated into the buildings, utilising the level change. The car parking is wrapped by residential uses. Communal amenity space provided atop, on podium level.

On street car parking is provided for the family homes, integrated into the play streets and along the perimeter street.

Overall, a parking ratio of 1:1 is provided for all homes.



Appendix D
TRICS/TRAVL Data and Trip Generation Calculations

Trip Rates / Generation - Mixed Use Residential (Page 1 of 2)

TRICS 7.1.3

TRAVL Database

TRIP RATE for Land Use C3 - Mixed Use Residential

Calculation Factor: 100 sqm

Count Type: TOTAL PEOPLE

Time Band	No. of Sites	Trip Rate In	Trip Rate Out	Total Trip Rate
07:00-08:00	2	0.032	0.152	0.183
08:00-09:00	2	0.064	0.233	0.297
09:00-10:00	2	0.066	0.082	0.148
10:00-11:00	2	0.051	0.085	0.136
11:00-12:00	2	0.064	0.092	0.156
12:00-13:00	2	0.062	0.077	0.139
13:00-14:00	2	0.068	0.070	0.137
14:00-15:00	2	0.069	0.079	0.148
15:00-16:00	2	0.143	0.075	0.218
16:00-17:00	2	0.157	0.091	0.248
17:00-18:00	2	0.126	0.080	0.207
18:00-19:00	2	0.165	0.096	0.260

Trip Rates (All Person)

Time Band	Arr	Dep	Total
07:00-08:00	0.032	0.152	0.183
08:00-09:00	0.064	0.233	0.297
09:00-10:00	0.066	0.082	0.148
10:00-11:00	0.051	0.085	0.136
11:00-12:00	0.064	0.092	0.156
12:00-13:00	0.062	0.077	0.139
13:00-14:00	0.068	0.070	0.137
14:00-15:00	0.069	0.079	0.148
15:00-16:00	0.143	0.075	0.218
16:00-17:00	0.157	0.091	0.248
17:00-18:00	0.126	0.080	0.207
18:00-19:00	0.165	0.096	0.260

Trip Generation (All Person)

370000 sqm

Time Band	Arr	Dep	Total
07:00-08:00	118.11	560.56	678.67
08:00-09:00	237.80	861.09	1098.88
09:00-10:00	243.95	302.90	546.84
10:00-11:00	189.49	312.83	502.32
11:00-12:00	237.09	340.01	577.10
12:00-13:00	228.49	284.87	513.36
13:00-14:00	250.80	257.42	508.22
14:00-15:00	254.49	293.78	548.26
15:00-16:00	529.13	276.81	805.94
16:00-17:00	580.84	336.07	916.90
17:00-18:00	466.86	297.53	764.39
18:00-19:00	609.81	353.63	963.44

Trip Rates / Generation - Mixed Use Residential (Page 2 of 2)

Census Mode Share (Resident Population)

Mode	#	%
Underground, Metro, Light Rail, Tram	742	12.5%
Train	610	10.2%
Bus, Minibus or Coach	592	9.9%
Taxi	47	0.8%
Motorcycle, Scooter or Moped	62	1.0%
Driving a Car or Van	3263	54.8%
Passenger in a Car or Van	277	4.7%
Bicycle	75	1.3%
On Foot	251	4.2%
Other Method of Travel to Work	34	0.6%
Total	4866	100.0%

Trip Generation (By Mode)

Proposed Resi Trip Attraction	Weekday am peak hour			Weekday pm peak hour		
	<i>In</i>	<i>Out</i>	<i>Two-way</i>	<i>In</i>	<i>Out</i>	<i>Two-way</i>
Person trip rates (per 100sqm)	0.06	0.23	0.30	0.13	0.08	0.21
Person trips (37 ha)	238	861	1099	467	298	764
Vehicle driver trips (54.8%)	130	472	602	256	163	419
Vehicle Passenger trips (4.7%)	11	40	51	22	14	36
Pedal cycle trips (1.3%)	3	11	14	6	4	10
Walk trips (4.2%)	10	36	46	20	13	32
Train trips (10.2%)	24	88	113	48	30	78
Underground trips (12.5%)	30	107	137	58	37	95
Bus trips (9.9%)	24	86	109	46	30	76
Motorcycle Trips (1.0%)	2	9	11	5	3	8
Other trips (1.4%)	3	12	15	6	4	10

Home	Work	Number	EB	WB	EB	WB
Havering 028	Thurrock 015	112	x		112	-
Havering 028	Havering 013	74	x		74	-
Havering 028	Havering 028	69	x		69	-
Havering 028	Havering 029	56	x		56	-
Havering 028	Barking and Dagenham 020	55		x	-	55
Havering 028	Havering 030	49	x		49	-
Havering 028	Havering 017	48	x		48	-
Havering 028	Havering 016	31	x		31	-
Havering 028	Barking and Dagenham 015	28		x	-	28
Havering 028	Havering 027	27	x		27	-
Havering 028	Havering 020	25	x		25	-
Havering 028	Barking and Dagenham 018	24		x	-	24
Havering 028	Redbridge 022	24		x	-	24
Havering 028	Havering 025	24	x		24	-
Havering 028	Barking and Dagenham 010	23		x	-	23
Havering 028	Barking and Dagenham 019	21		x	-	21
Havering 028	Havering 007	20	x		20	-
Havering 028	Barking and Dagenham 022	18		x	-	18
Havering 028	Havering 022	18	x		18	-
Havering 028	Havering 023	17	x		17	-
Havering 028	Redbridge 030	16		x	-	16
Havering 028	Barking and Dagenham 007	15		x	-	15
Havering 028	Barking and Dagenham 023	13		x	-	13
Havering 028	Tower Hamlets 033	13		x	-	13
Havering 028	Brentwood 008	13	x		13	-
Havering 028	Havering 021	12	x		12	-
Havering 028	Barking and Dagenham 021	12		x	-	12
Havering 028	Basildon 015	11	x		11	-
Havering 028	Newham 027	11		x	-	11
Havering 028	Barking and Dagenham 006	11		x	-	11
Havering 028	City of London 001	10		x	-	10
Havering 028	Thurrock 016	10	x		10	-
Havering 028	Thurrock 008	10	x		10	-
Havering 028	Havering 026	10	x		10	-
Havering 028	Barking and Dagenham 003	10		x	-	10
Havering 028	Havering 010	9	x		9	-
Havering 028	Redbridge 002	9		x	-	9
Havering 028	Newham 037	9		x	-	9

Home	Work	Number	EB	WB	EB	WB
Havering 028	Basildon 014	9	x		9	-
Havering 028	Havering 011	9	x		9	-
Havering 028	Brentwood 006	8	x		8	-
Havering 028	Barking and Dagenham 009	8		x	-	8
Havering 028	Havering 004	8	x		8	-
Havering 028	Barking and Dagenham 013	8		x	-	8
Havering 028	Dartford 006	8	x		8	-
Havering 028	Redbridge 034	8		x	-	8
Havering 028	Barking and Dagenham 002	8		x	-	8
Havering 028	Thurrock 006	8	x		8	-
Havering 028	Redbridge 019	8		x	-	8
Havering 028	Redbridge 006	8		x	-	8
Havering 028	Havering 019	8	x		8	-
Havering 028	Havering 014	8	x		8	-
Havering 028	Basildon 012	7	x		7	-
Havering 028	Newham 033	7		x	-	7
Havering 028	Newham 028	7		x	-	7
Havering 028	Thurrock 018	7	x		7	-
Havering 028	Newham 013	7		x	-	7
Havering 028	Newham 035	7		x	-	7
Havering 028	Havering 024	7	x		7	-
Havering 028	Barking and Dagenham 011	7		x	-	7
Havering 028	Newham 021	6		x	-	6
Havering 028	Havering 012	6	x		6	-
Havering 028	Basildon 011	6	x		6	-
Havering 028	Thurrock 017	6	x		6	-
Havering 028	Newham 034	6		x	-	6
Havering 028	Havering 009	6	x		6	-
Havering 028	Tower Hamlets 012	6		x	-	6
Havering 028	Tower Hamlets 028	6		x	-	6
Total					756	429
					63.8%	36.2%

Appendix E
Traffic Flow Diagrams

Traffic Flow Diagrams - Existing/Baseline Flows

Figure 1 - 2013 Existing Traffic (AM Peak Hour)

Key

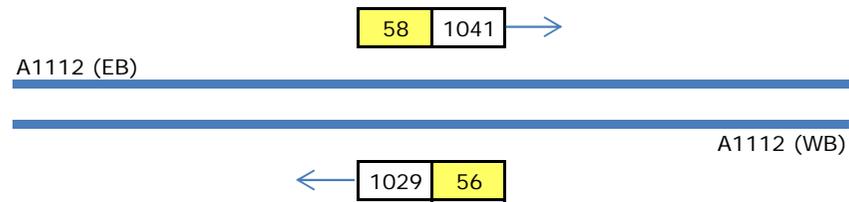
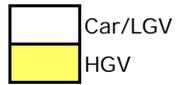
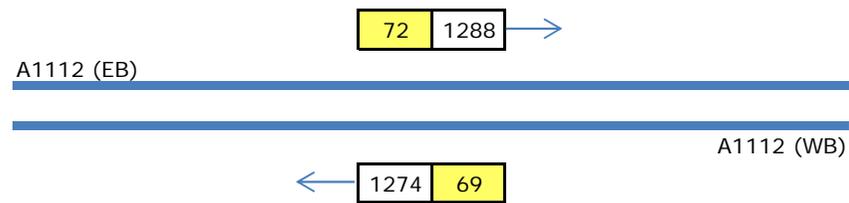
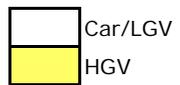


Figure 2 - 2031 Baseline Traffic (AM Peak Hour)

1.24 2013 to 2031 Peak Hour Growth Factor

Key



Traffic Flow Diagrams - Development Flows

Figure 3 - Proposed Development Distribution

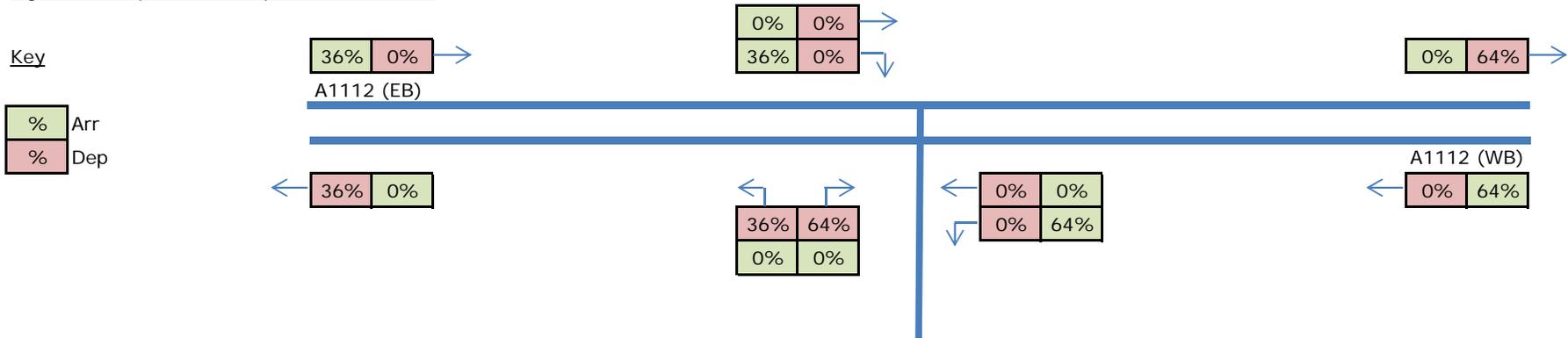
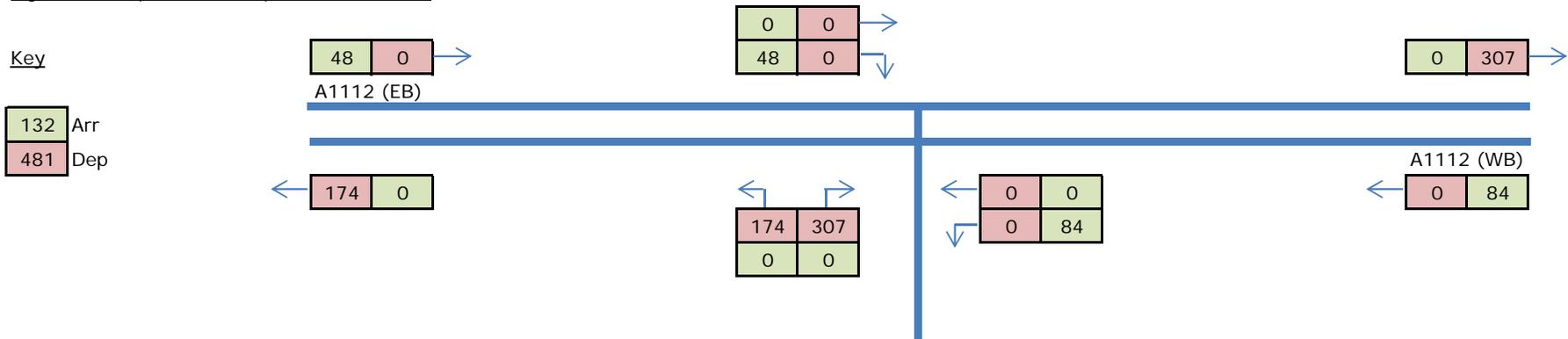


Figure 4 - Proposed Development Generation



Traffic Flow Diagrams - Total Flows

Figure 5 - 2013 - Total Traffic (AM Peak Hour)

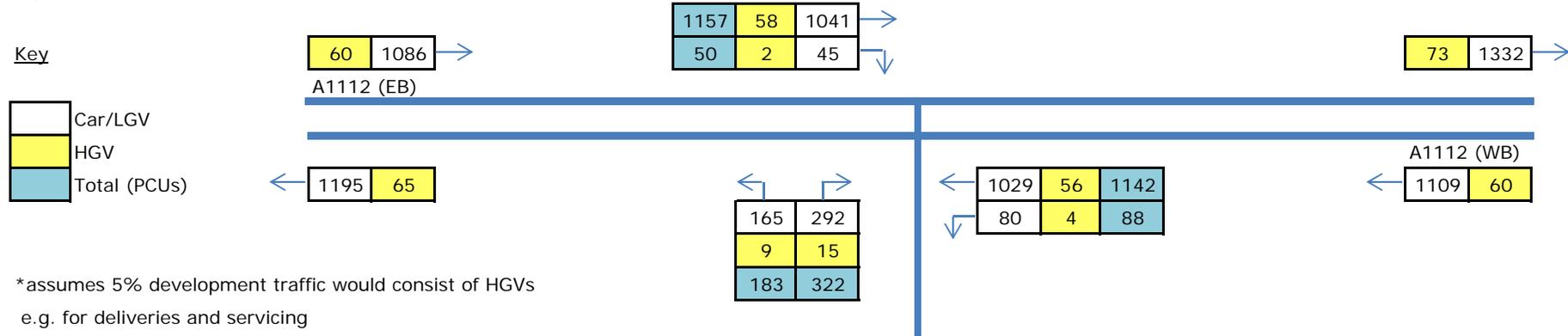
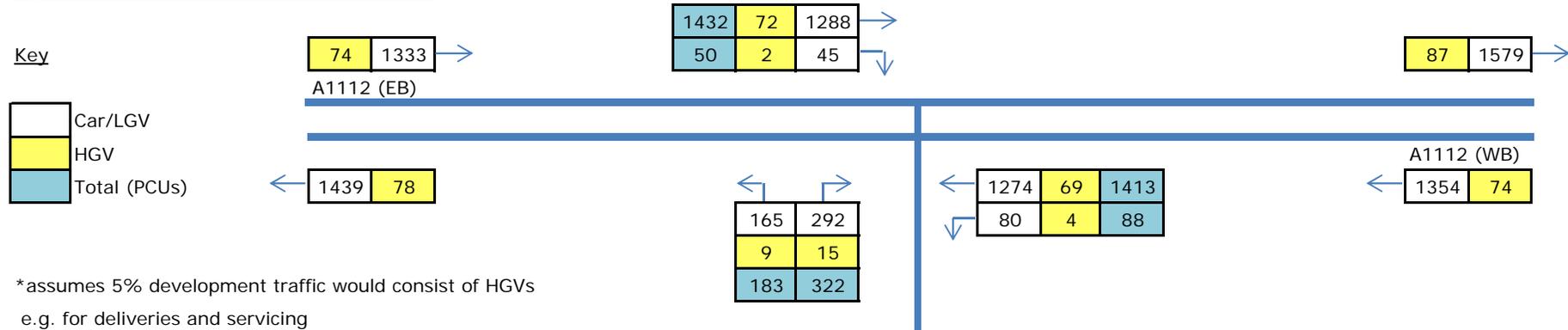


Figure 6 - 2031 - Total Traffic (AM Peak Hour)



Appendix F

ARCADY Outputs: Proposed Site Access Junction (Option 1)

ARCADY 8
Version: 8.0.0.296 [27 Feb 2012] © Copyright Transport Research Laboratory 2015
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 E-mail: software@trl.co.uk Web: http://www.trlsoftware.co.uk
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: Mardyke Farm - Proposed Site Access Option.arc8
Path: Y:\ARDENT BID PROJECTS\W420 - Mardyke Farm, South Hornchurch\Transport\ARCADY
Report generation date: 04/03/2015 14:23:51

- » (Default Analysis Set) - 2013 Peak + Dev, AM
- » (Default Analysis Set) - 2031 Peak + Dev, AM

Summary of junction performance

	AM				
	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
A1 - 2013 Peak + Dev					
A1112 (E)	3.12	7.20	0.76	A	12% [A1112 (W)]
Site Access (S)	1.02	6.95	0.51	A	
A1112 (W)	5.01	12.01	0.84	B	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

'D1 - 2013 Peak + Dev, AM' model duration: 07:45 - 09:15
 'D2 - 2031 Peak + Dev, AM' model duration: 07:45 - 09:15

Run using ARCADY 8.0.0.296 at 04/03/2015 14:23:50

File summary

File Description

Title	Proposed Site Access
Location	Mardyke Farm
Site Number	
Date	03/03/2015
Version	
Status	Preliminary
Identifier	
Client	Barratt London
Jobnumber	W420
Enumerator	ARDENTCE\cburton
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75		✓	Delay	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
----------------	-------------	---------------------	-----------------------	------------	---------------------	-------------------	---------------------

m	kph	Veh	Veh	perHour	s	-Min	perMin
---	-----	-----	-----	---------	---	------	--------

(Default Analysis Set) - 2013 Peak + Dev, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2013 Peak + Dev, AM	2013 Peak + Dev	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
Proposed Site Access	Roundabout	A,B,C			5.57	A

Junction Network Options

Driving Side	Lighting	Road Surface	Network Residual Capacity (%)	First Arm Reaching Threshold
Left	Normal/unknown	(Mini-roundabouts only)	35	A1112 (W)

Arms

Arms

Name	Name	Description
A1112 (E)	A1112 (E)	
Site Access (S)	Site Access (S)	
A1112 (W)	A1112 (W)	

Roundabout Geometry

Name	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A1112 (E)	7.00	7.40	10.00	30.00	60.00	31.00	
Site Access (S)	6.20	7.00	20.00	30.00	60.00	20.00	
A1112 (W)	7.00	7.60	7.00	20.00	60.00	39.00	

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Pedestrian Crossings

Name	Crossing Type
A1112 (E)	Pelican
Site Access (S)	Pelican
A1112 (W)	Pelican

Pelican/ Puffin Crossings

Name	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)	Space between crossing and junction entry (PCU)
A1112 (E)	3.00	2.90	1.00	6.00	6.00	7.00	3.00
Site Access (S)	3.00	2.90	1.00	6.00	6.00	7.00	1.00
A1112 (W)	3.00	2.90	1.00	6.00	6.00	7.00	3.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Name	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A1112 (E)		(calculated)	(calculated)	0.657	2257.038
Site Access (S)		(calculated)	(calculated)	0.657	2200.262
A1112 (W)		(calculated)	(calculated)	0.634	2192.974

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A1112 (E)	ONE HOUR	✓	1169.00	100.000
Site Access (S)	ONE HOUR	✓	481.00	100.000
A1112 (W)	ONE HOUR	✓	1146.00	100.000

Pedestrian Flows

General Flows Data

Name	Profile Type	Average Pedestrian Flow (Ped/hr)
A1112 (E)	ONE HOUR	30.00
Site Access (S)	ONE HOUR	60.00
A1112 (W)	ONE HOUR	30.00

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Proposed Site Access (for whole period)

	To		
	A	B	C

From	A	0.000	84.000	1085.000
	B	307.000	0.000	174.000
	C	1099.000	47.000	0.000

Turning Proportions (Veh) - Proposed Site Access (for whole period)

From	To			
		A	B	C
	A	0.00	0.07	0.93
	B	0.64	0.00	0.36
C	0.96	0.04	0.00	

Vehicle Mix

Average PCU Per Vehicle - Proposed Site Access (for whole period)

From	To			
		A	B	C
	A	1.000	1.050	1.050
	B	1.050	1.000	1.050
C	1.050	1.050	1.000	

Heavy Vehicle Percentages - Proposed Site Access (for whole period)

From	To			
		A	B	C
	A	0.000	5.000	5.000
	B	5.000	0.000	5.000
C	5.000	5.000	0.000	

Results

Results Summary for whole modelled period

Name	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A1112 (E)	0.63	4.82	1.71	A
Site Access (S)	0.44	5.36	0.78	A
A1112 (W)	0.70	6.43	2.24	A

Main Results for each time segment

Main results: (07:45-08:00)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	880.08	877.08	35.24	22.59	2044.12	0.431	0.75	3.077	A
Site Access (S)	362.12	360.79	814.05	45.17	1441.23	0.251	0.33	3.327	A
A1112 (W)	862.77	859.36	230.27	22.59	1869.06	0.462	0.85	3.554	A

Main results: (08:00-08:15)

Name	Total Demand	Entry Flow	Circulating Flow	Pedestrian Demand	Capacity	RFC	End Queue	Delay	LOS
------	--------------	------------	------------------	-------------------	----------	-----	-----------	-------	-----

Name	(Veh/hr)	(Veh/hr)	(Veh/hr)	(Ped/hr)	(Veh/hr)	RFC	(Veh)	(s)	LOS
A1112 (E)	1050.91	1049.69	42.19	26.97	2037.92	0.516	1.06	3.637	A
Site Access (S)	432.41	431.84	974.26	53.94	1336.49	0.324	0.48	3.976	A
A1112 (W)	1030.23	1028.63	275.63	26.97	1843.94	0.559	1.25	4.406	A

Main results: (08:15-08:30)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1287.09	1284.48	51.59	33.03	2028.94	0.634	1.71	4.818	A
Site Access (S)	529.59	528.36	1192.18	66.06	1198.80	0.442	0.78	5.360	A
A1112 (W)	1261.77	1257.84	337.23	33.03	1813.39	0.696	2.24	6.433	A

Main results: (08:30-08:45)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1287.09	1287.09	51.75	33.03	2038.68	0.631	1.71	4.789	A
Site Access (S)	529.59	529.59	1194.61	66.06	1205.79	0.439	0.78	5.323	A
A1112 (W)	1261.77	1261.77	338.01	33.03	1827.70	0.690	2.24	6.361	A

Main results: (08:45-09:00)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1050.91	1053.51	42.41	26.97	2049.82	0.513	1.06	3.624	A
Site Access (S)	432.41	433.63	977.81	53.94	1344.80	0.322	0.48	3.957	A
A1112 (W)	1030.23	1034.16	276.77	26.97	1860.56	0.554	1.25	4.376	A

Main results: (09:00-09:15)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	880.08	881.31	35.45	22.59	2055.24	0.428	0.75	3.071	A
Site Access (S)	362.12	362.69	817.99	45.17	1448.35	0.250	0.33	3.319	A
A1112 (W)	862.77	864.37	231.49	22.59	1881.63	0.459	0.85	3.543	A

(Default Analysis Set) - 2031 Peak + Dev, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2031 Peak + Dev, AM	2031 Peak + Dev	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
Proposed Site Access	Roundabout	A,B,C			9.21	A

Junction Network Options

Driving Side	Lighting	Road Surface	Network Residual Capacity (%)	First Arm Reaching Threshold
Left	Normal/unknown	(Mini-roundabouts only)	12	A1112 (W)

Arms

Arms

Name	Name	Description
A1112 (E)	A1112 (E)	
Site Access (S)	Site Access (S)	
A1112 (W)	A1112 (W)	

Roundabout Geometry

Name	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
A1112 (E)	7.00	7.40	10.00	30.00	60.00	31.00	
Site Access (S)	6.20	7.00	20.00	30.00	60.00	20.00	
A1112 (W)	7.00	7.60	7.00	20.00	60.00	39.00	

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Pedestrian Crossings

Name	Crossing Type
A1112 (E)	Pelican
Site Access (S)	Pelican
A1112 (W)	Pelican

Pelican/ Puffin Crossings

Name	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)	Space between crossing and junction entry (PCU)
A1112 (E)	3.00	2.90	1.00	6.00	6.00	7.00	3.00
Site Access (S)	3.00	2.90	1.00	6.00	6.00	7.00	1.00
A1112 (W)	3.00	2.90	1.00	6.00	6.00	7.00	3.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Name	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
A1112 (E)		(calculated)	(calculated)	0.657	2257.038
Site Access (S)		(calculated)	(calculated)	0.657	2200.262
A1112 (W)		(calculated)	(calculated)	0.634	2192.974

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Name	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A1112 (E)	ONE HOUR	✓	1427.00	100.000
Site Access (S)	ONE HOUR	✓	481.00	100.000
A1112 (W)	ONE HOUR	✓	1407.00	100.000

Pedestrian Flows

General Flows Data

Name	Profile Type	Average Pedestrian Flow (Ped/hr)
A1112 (E)	ONE HOUR	30.00
Site Access (S)	ONE HOUR	60.00
A1112 (W)	ONE HOUR	30.00

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Proposed Site Access (for whole period)

		To		
		A	B	C
From	A	0.000	84.000	1343.000
	B	307.000	0.000	174.000
	C	1360.000	47.000	0.000

Turning Proportions (Veh) - Proposed Site Access (for whole period)

		To		
		A	B	C
From	A	0.00	0.06	0.94
	B	0.64	0.00	0.36
	C	0.97	0.03	0.00

Vehicle Mix

Average PCU Per Vehicle - Proposed Site Access (for whole period)

		To		
		A	B	C
From	A	1.000	1.050	1.050
	B	1.050	1.000	1.050
	C	1.050	1.050	1.000

Heavy Vehicle Percentages - Proposed Site Access (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	5.000
	B	5.000	0.000	5.000
	C	5.000	5.000	0.000

Results

Results Summary for whole modelled period

Name	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A1112 (E)	0.76	7.20	3.12	A
Site Access (S)	0.51	6.95	1.02	A
A1112 (W)	0.84	12.01	5.01	B

Main Results for each time segment

Main results: (07:45-08:00)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1074.32	1069.94	35.21	22.59	2047.77	0.525	1.09	3.665	A
Site Access (S)	362.12	360.63	1006.96	45.17	1325.49	0.273	0.37	3.727	A
A1112 (W)	1059.26	1054.12	230.17	22.59	1873.73	0.565	1.29	4.366	A

Main results: (08:00-08:15)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1282.84	1280.62	42.15	26.97	2049.65	0.626	1.65	4.668	A
Site Access (S)	432.41	431.67	1205.23	53.94	1201.88	0.360	0.56	4.670	A
A1112 (W)	1264.86	1261.67	275.52	26.97	1859.83	0.680	2.08	5.986	A

Main results: (08:15-08:30)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1571.16	1565.29	51.38	33.03	2059.15	0.763	3.12	7.203	A
Site Access (S)	529.59	527.76	1473.15	66.06	1043.51	0.508	1.01	6.954	A
A1112 (W)	1549.14	1538.15	336.85	33.03	1847.08	0.839	4.83	11.267	B

Main results: (08:30-08:45)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1571.16	1571.15	51.72	33.03	2073.17	0.758	3.12	7.170	A
Site Access (S)	529.59	529.59	1478.67	66.06	1049.38	0.505	1.02	6.925	A
A1112 (W)	1549.14	1548.43	338.01	33.03	1846.39	0.839	5.01	12.006	B

Main results: (08:45-09:00)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1282.84	1288.75	42.64	26.97	2074.51	0.618	1.64	4.616	A
Site Access (S)	432.41	434.24	1212.89	53.94	1212.18	0.357	0.56	4.637	A
A1112 (W)	1264.86	1276.63	277.15	26.97	1888.13	0.670	2.07	5.998	A

Main results: (09:00-09:15)

Name	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
A1112 (E)	1074.32	1076.51	35.49	22.59	2064.97	0.520	1.09	3.652	A
Site Access (S)	362.12	362.86	1013.14	45.17	1332.88	0.272	0.38	3.713	A
A1112 (W)	1059.26	1062.41	231.59	22.59	1894.73	0.559	1.28	4.342	A

Appendix G

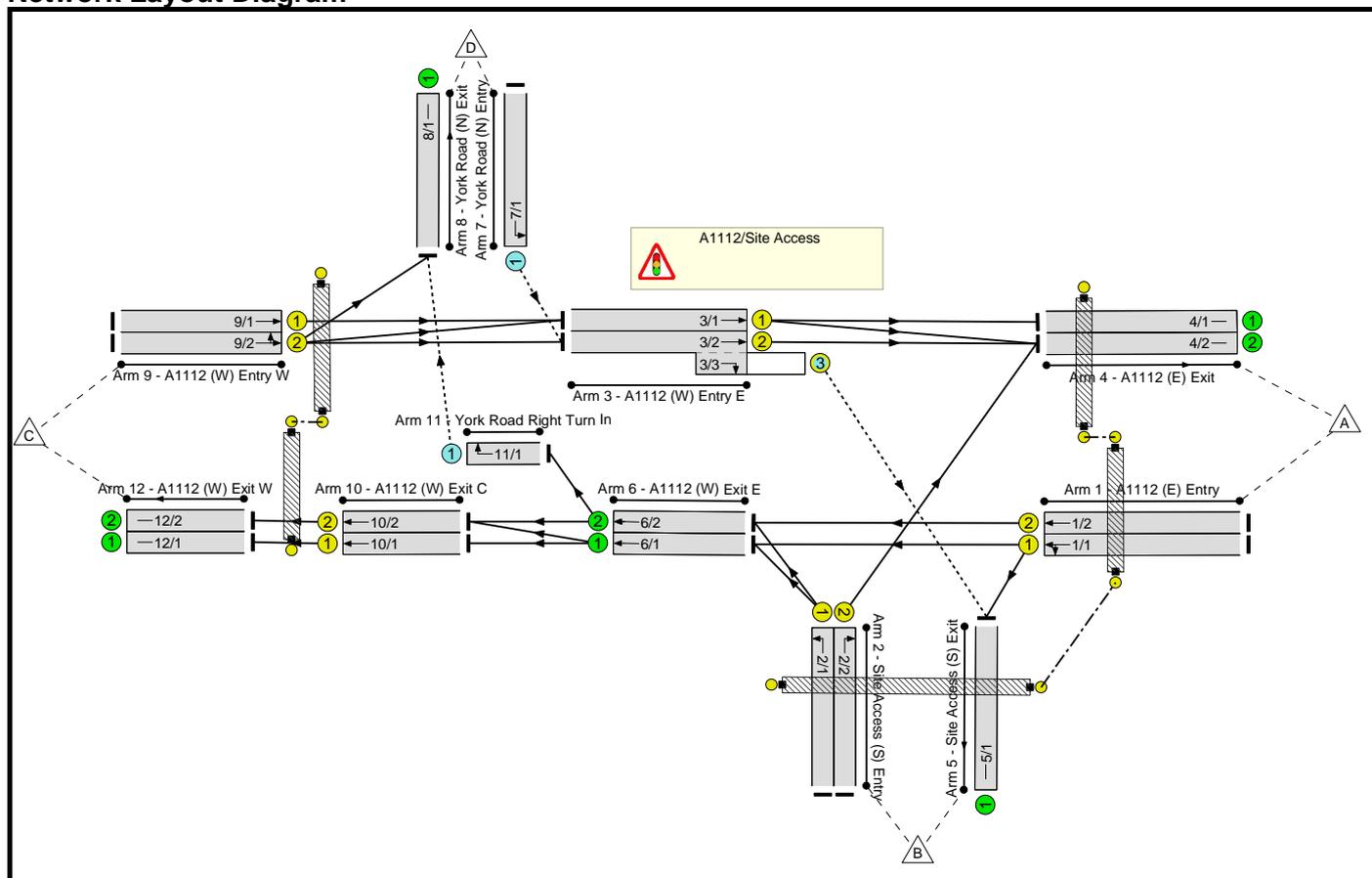
LINSIG Outputs: Proposed Site Access Junction (Option 2)

Full Input Data And Results
Full Input Data And Results

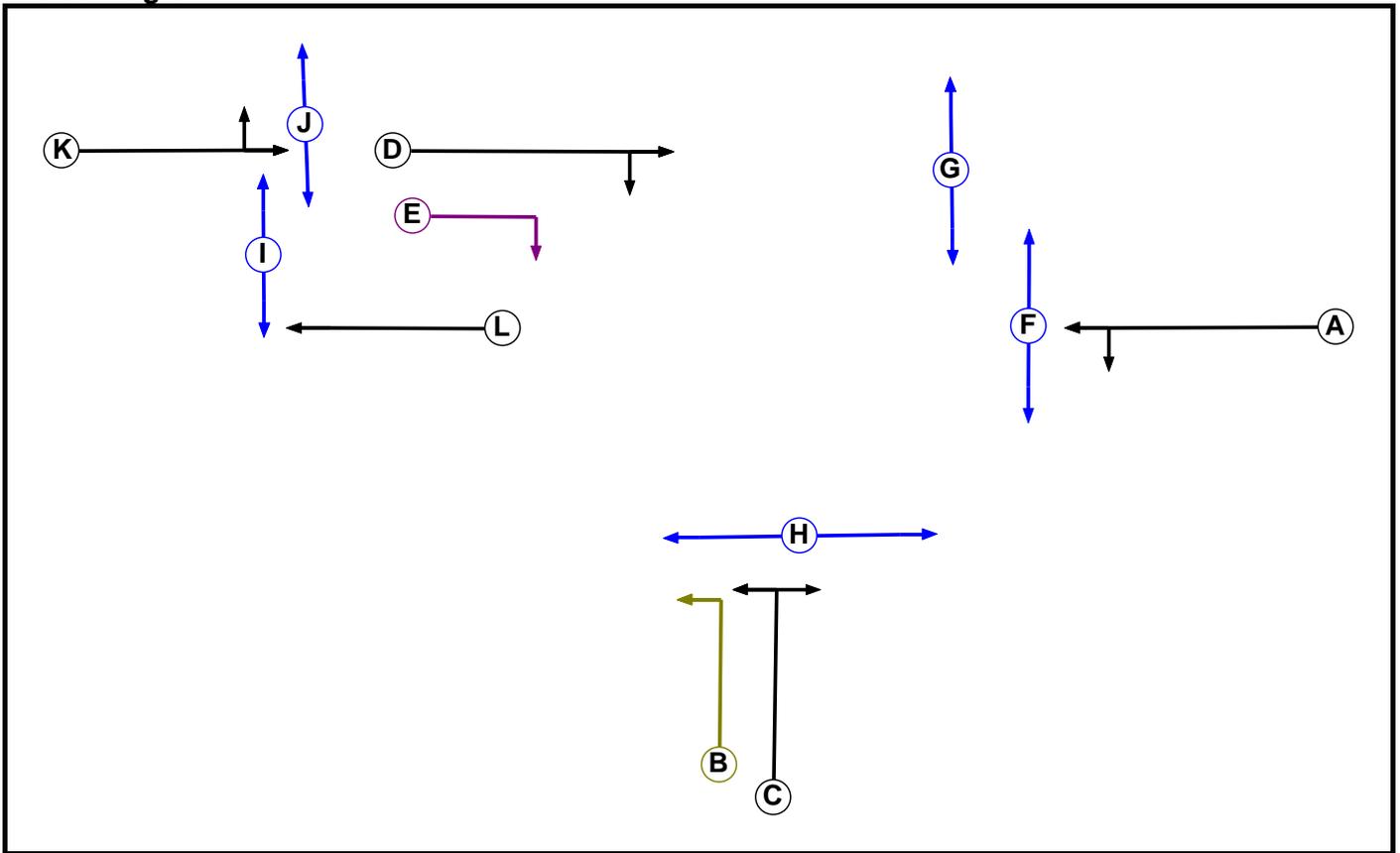
User and Project Details

Project:	W420 Mardyke Farm
Title:	A1112/Site Access Junction
Location:	London Borough of Havering
File name:	A1112_Site Access Junction_v6_040315.lsg3x
Author:	CB
Company:	Ardent
Address:	
Notes:	

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Filter	C	4	4
C	Traffic		7	7
D	Traffic		7	7
E	Ind. Arrow	D	4	4
F	Pedestrian		7	7
G	Pedestrian		7	7
H	Pedestrian		7	7
I	Pedestrian		7	7
J	Pedestrian		7	7
K	Traffic		7	7
L	Traffic		7	7

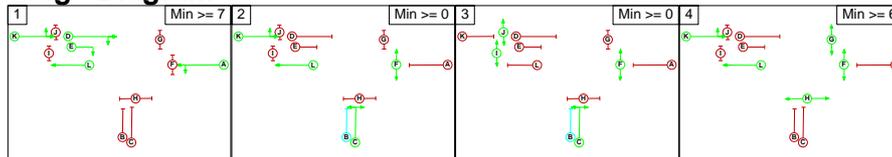
Phase Intergrens Matrix

		Starting Phase											
		A	B	C	D	E	F	G	H	I	J	K	L
Terminating Phase	A		6	5	-	-	5	-	7	-	-	-	-
	B	5		-	-	-	-	-	5	-	-	-	-
	C	5	-		5	5	-	7	5	-	-	-	-
	D	-	-	5		-	-	7	-	-	-	-	-
	E	-	-	5	-		-	-	7	-	-	-	-
	F	8	-	-	-	-		-	-	-	-	-	-
	G	-	-	7	7	-	-		-	-	-	-	-
	H	15	15	15	-	15	-	-		-	-	-	-
	I	-	-	-	-	-	-	-	-		-	-	8
	J	-	-	-	-	-	-	-	-	-		8	-
	K	-	-	-	-	-	-	-	-	-	5		-
	L	-	-	-	-	-	-	-	-	5	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D E K L
2	C F K L
3	C F I J
4	F G H K L

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1		5	5	7
	2	8		5	7
	3	8	8		8
	4	15	15	15	

Full Input Data And Results

Give-Way Lane Input Data

Junction: A1112/Site Access											
Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
3/3 (A1112 (W) Entry E)	5/1 (Right)	1439	0	1/1	1.09	All	4.00	-	0.50	4	4.00
				1/2	1.09	All					
7/1 (York Road (N) Entry)	3/2 (Left)	1439	0	9/1	1.09	To 3/1 (Ahead)	-	-	-	-	-
				9/2	1.09	All					
11/1 (York Road Right Turn In)	8/1 (Right)	1439	0	9/1	1.09	All	-	-	-	-	-
				9/2	1.09	All					

Full Input Data And Results

Lane Input Data

Junction: A1112/Site Access												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A1112 (E) Entry)	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left	10.00
											Arm 6 Ahead	Inf
1/2 (A1112 (E) Entry)	U	A	2	3	60.0	Geom	-	3.50	0.00	N	Arm 6 Ahead	Inf
2/1 (Site Access (S) Entry)	U	C B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Left	10.00
2/2 (Site Access (S) Entry)	U	C	2	3	60.0	Geom	-	3.25	0.00	N	Arm 4 Right	11.00
3/1 (A1112 (W) Entry E)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Ahead	Inf
3/2 (A1112 (W) Entry E)	U	D	2	3	60.0	Geom	-	3.00	0.00	N	Arm 4 Ahead	Inf
3/3 (A1112 (W) Entry E)	O	D E	2	3	3.5	Geom	-	3.00	0.00	N	Arm 5 Right	11.00
4/1 (A1112 (E) Exit)	U		2	3	60.0	Geom	-	3.00	0.00	Y		
4/2 (A1112 (E) Exit)	U		2	3	60.0	Geom	-	3.00	0.00	N		
5/1 (Site Access (S) Exit)	U		2	3	60.0	Geom	-	3.50	0.00	Y		
6/1 (A1112 (W) Exit E)	U		2	3	5.2	Geom	-	3.50	0.00	Y	Arm 10 Ahead	Inf
											Arm 10 Ahead	Inf
6/2 (A1112 (W) Exit E)	U		2	3	5.2	Geom	-	3.50	0.00	N	Arm 11 Ahead	Inf
7/1 (York Road (N) Entry)	O		2	3	60.0	Geom	-	3.50	0.00	Y	Arm 3 Left	6.00
8/1 (York Road (N) Exit)	U		2	3	60.0	Geom	-	3.50	0.00	Y		
9/1 (A1112 (W) Entry W)	U	K	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 3 Ahead	Inf
											Arm 3 Ahead	Inf
9/2 (A1112 (W) Entry W)	U	K	2	3	60.0	Geom	-	3.50	0.00	N	Arm 8 Left	Inf

Full Input Data And Results

10/1 (A1112 (W) Exit C)	U	L	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 12 Ahead	Inf
10/2 (A1112 (W) Exit C)	U	L	2	3	60.0	Geom	-	3.50	0.00	N	Arm 12 Ahead	Inf
11/1 (York Road Right Turn In)	O		2	3	1.4	Geom	-	3.50	0.00	N	Arm 8 Right	10.00
12/1 (A1112 (W) Exit W)	U		2	3	60.0	Geom	-	3.50	0.00	Y		
12/2 (A1112 (W) Exit W)	U		2	3	60.0	Geom	-	3.50	0.00	N		

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2013 AM Peak'	08:00	09:00	01:00	
2: '2031 AM Peak'	08:00	09:00	01:00	

Scenario 1: '2013 AM Peak' (FG1: '2013 AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination					
	A	B	C	D	Tot.	
Origin	A	0	88	1142	15	1245
	B	322	0	183	0	505
	C	1157	50	0	15	1222
	D	30	0	0	0	30
	Tot.	1509	138	1325	30	3002

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2013 AM Peak
Junction: A1112/Site Access	
1/1	590
1/2	655
2/1	183
2/2	322
3/1	581
3/2 (with short)	656(In) 606(Out)
3/3 (short)	50
4/1	581
4/2	928
5/1	138
6/1	547
6/2	793
7/1	30
8/1	30
9/1	64
9/2	1158
10/1	73
10/2	1252
11/1	15
12/1	73
12/2	1252

Full Input Data And Results

Lane Saturation Flows

Junction: A1112/Site Access								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (A1112 (E) Entry)	3.50	0.00	Y	Arm 5 Left	10.00	14.9 %	1922	1922
				Arm 6 Ahead	Inf	85.1 %		
1/2 (A1112 (E) Entry)	3.50	0.00	N	Arm 6 Ahead	Inf	100.0 %	2105	2105
2/1 (Site Access (S) Entry)	3.25	0.00	Y	Arm 6 Left	10.00	100.0 %	1687	1687
2/2 (Site Access (S) Entry)	3.25	0.00	N	Arm 4 Right	11.00	100.0 %	1830	1830
3/1 (A1112 (W) Entry E)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
3/2 (A1112 (W) Entry E)	3.00	0.00	N	Arm 4 Ahead	Inf	100.0 %	2055	2055
3/3 (A1112 (W) Entry E)	3.00	0.00	N	Arm 5 Right	11.00	100.0 %	1808	1808
4/1 (A1112 (E) Exit)	3.00	0.00	Y				1915	1915
4/2 (A1112 (E) Exit)	3.00	0.00	N				2055	2055
5/1 (Site Access (S) Exit)	3.50	0.00	Y				1965	1965
6/1 (A1112 (W) Exit E)	3.50	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1965	1965
6/2 (A1112 (W) Exit E)	3.50	0.00	N	Arm 10 Ahead	Inf	98.1 %	2105	2105
				Arm 11 Ahead	Inf	1.9 %		
7/1 (York Road (N) Entry)	3.50	0.00	Y	Arm 3 Left	6.00	100.0 %	1572	1572
8/1 (York Road (N) Exit)	3.50	0.00	Y				1965	1965
9/1 (A1112 (W) Entry W)	3.50	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1965	1965
9/2 (A1112 (W) Entry W)	3.50	0.00	N	Arm 3 Ahead	Inf	98.7 %	2105	2105
				Arm 8 Left	Inf	1.3 %		
10/1 (A1112 (W) Exit C)	3.50	0.00	Y	Arm 12 Ahead	Inf	100.0 %	1965	1965
10/2 (A1112 (W) Exit C)	3.50	0.00	N	Arm 12 Ahead	Inf	100.0 %	2105	2105
11/1 (York Road Right Turn In)	3.50	0.00	N	Arm 8 Right	10.00	100.0 %	1830	1830
12/1 (A1112 (W) Exit W)	3.50	0.00	Y				1965	1965
12/2 (A1112 (W) Exit W)	3.50	0.00	N				2105	2105

Full Input Data And Results

Scenario 2: '2031 AM Peak' (FG2: '2031 AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination					
	A	B	C	D	Tot.	
Origin	A	0	88	1413	15	1516
	B	322	0	183	0	505
	C	1432	50	0	15	1497
	D	30	0	0	0	30
	Tot.	1784	138	1596	30	3548

Traffic Lane Flows

Lane	Scenario 2: 2031 AM Peak
Junction: A1112/Site Access	
1/1	722
1/2	794
2/1	183
2/2	322
3/1	712
3/2 (with short)	800(In) 750(Out)
3/3 (short)	50
4/1	712
4/2	1072
5/1	138
6/1	679
6/2	932
7/1	30
8/1	30
9/1	77
9/2	1420
10/1	85
10/2	1511
11/1	15
12/1	85
12/2	1511

Full Input Data And Results

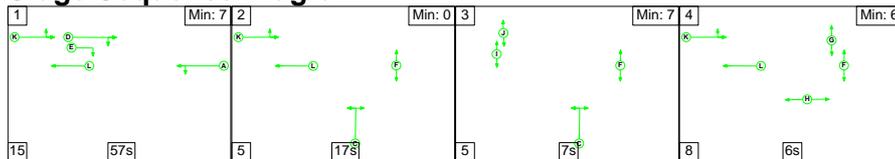
Lane Saturation Flows

Junction: A1112/Site Access								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (A1112 (E) Entry)	3.50	0.00	Y	Arm 5 Left	10.00	12.2 %	1930	1930
				Arm 6 Ahead	Inf	87.8 %		
1/2 (A1112 (E) Entry)	3.50	0.00	N	Arm 6 Ahead	Inf	100.0 %	2105	2105
2/1 (Site Access (S) Entry)	3.25	0.00	Y	Arm 6 Left	10.00	100.0 %	1687	1687
2/2 (Site Access (S) Entry)	3.25	0.00	N	Arm 4 Right	11.00	100.0 %	1830	1830
3/1 (A1112 (W) Entry E)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
3/2 (A1112 (W) Entry E)	3.00	0.00	N	Arm 4 Ahead	Inf	100.0 %	2055	2055
3/3 (A1112 (W) Entry E)	3.00	0.00	N	Arm 5 Right	11.00	100.0 %	1808	1808
4/1 (A1112 (E) Exit)	3.00	0.00	Y				1915	1915
4/2 (A1112 (E) Exit)	3.00	0.00	N				2055	2055
5/1 (Site Access (S) Exit)	3.50	0.00	Y				1965	1965
6/1 (A1112 (W) Exit E)	3.50	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1965	1965
6/2 (A1112 (W) Exit E)	3.50	0.00	N	Arm 10 Ahead	Inf	98.4 %	2105	2105
				Arm 11 Ahead	Inf	1.6 %		
7/1 (York Road (N) Entry)	3.50	0.00	Y	Arm 3 Left	6.00	100.0 %	1572	1572
8/1 (York Road (N) Exit)	3.50	0.00	Y				1965	1965
9/1 (A1112 (W) Entry W)	3.50	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1965	1965
9/2 (A1112 (W) Entry W)	3.50	0.00	N	Arm 3 Ahead	Inf	98.9 %	2105	2105
				Arm 8 Left	Inf	1.1 %		
10/1 (A1112 (W) Exit C)	3.50	0.00	Y	Arm 12 Ahead	Inf	100.0 %	1965	1965
10/2 (A1112 (W) Exit C)	3.50	0.00	N	Arm 12 Ahead	Inf	100.0 %	2105	2105
11/1 (York Road Right Turn In)	3.50	0.00	N	Arm 8 Right	10.00	100.0 %	1830	1830
12/1 (A1112 (W) Exit W)	3.50	0.00	Y				1965	1965
12/2 (A1112 (W) Exit W)	3.50	0.00	N				2105	2105

Full Input Data And Results

Scenario 1: '2013 AM Peak' (FG1: '2013 AM Peak', Plan 1: 'Network Control Plan 1')

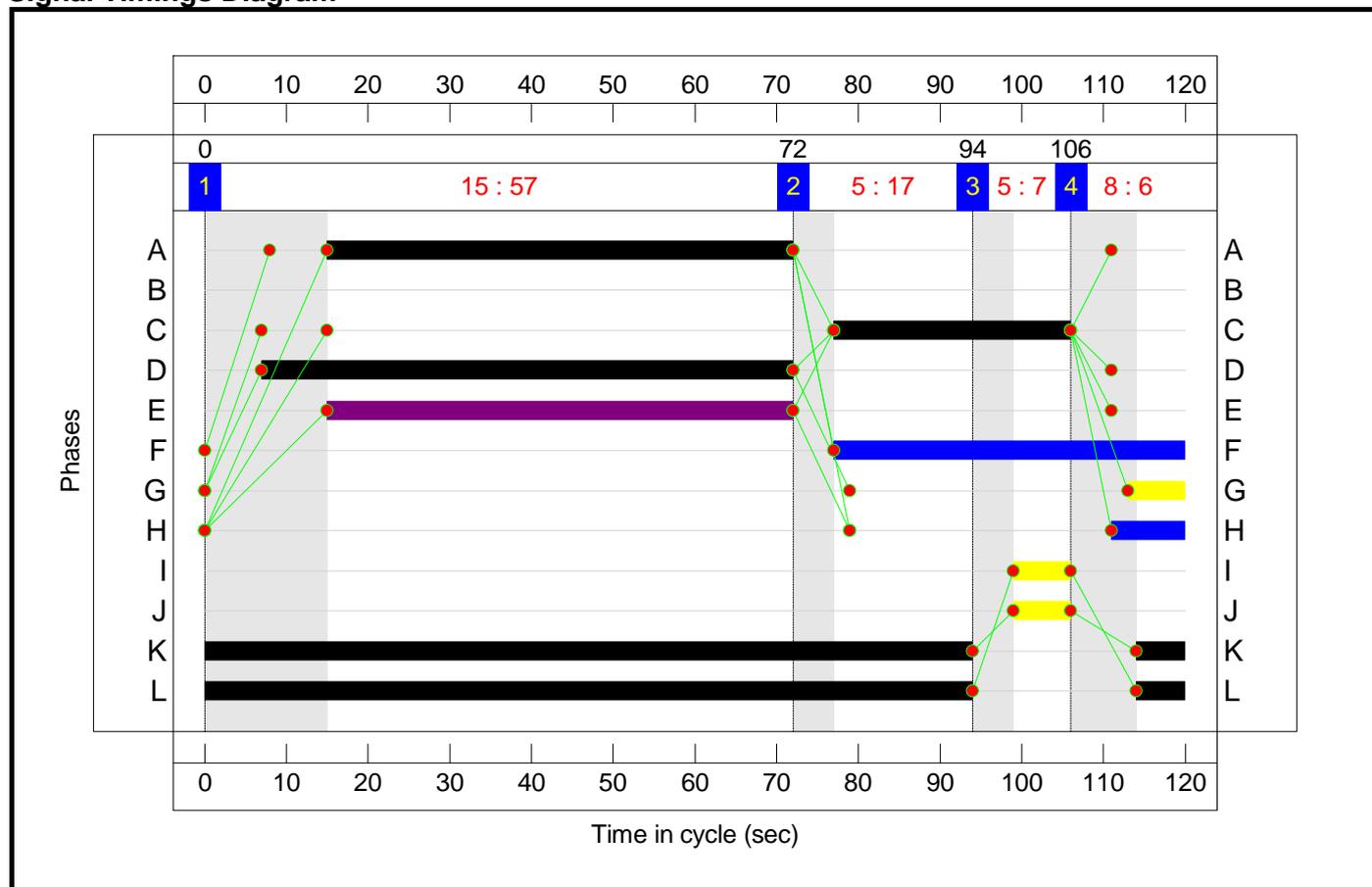
Stage Sequence Diagram



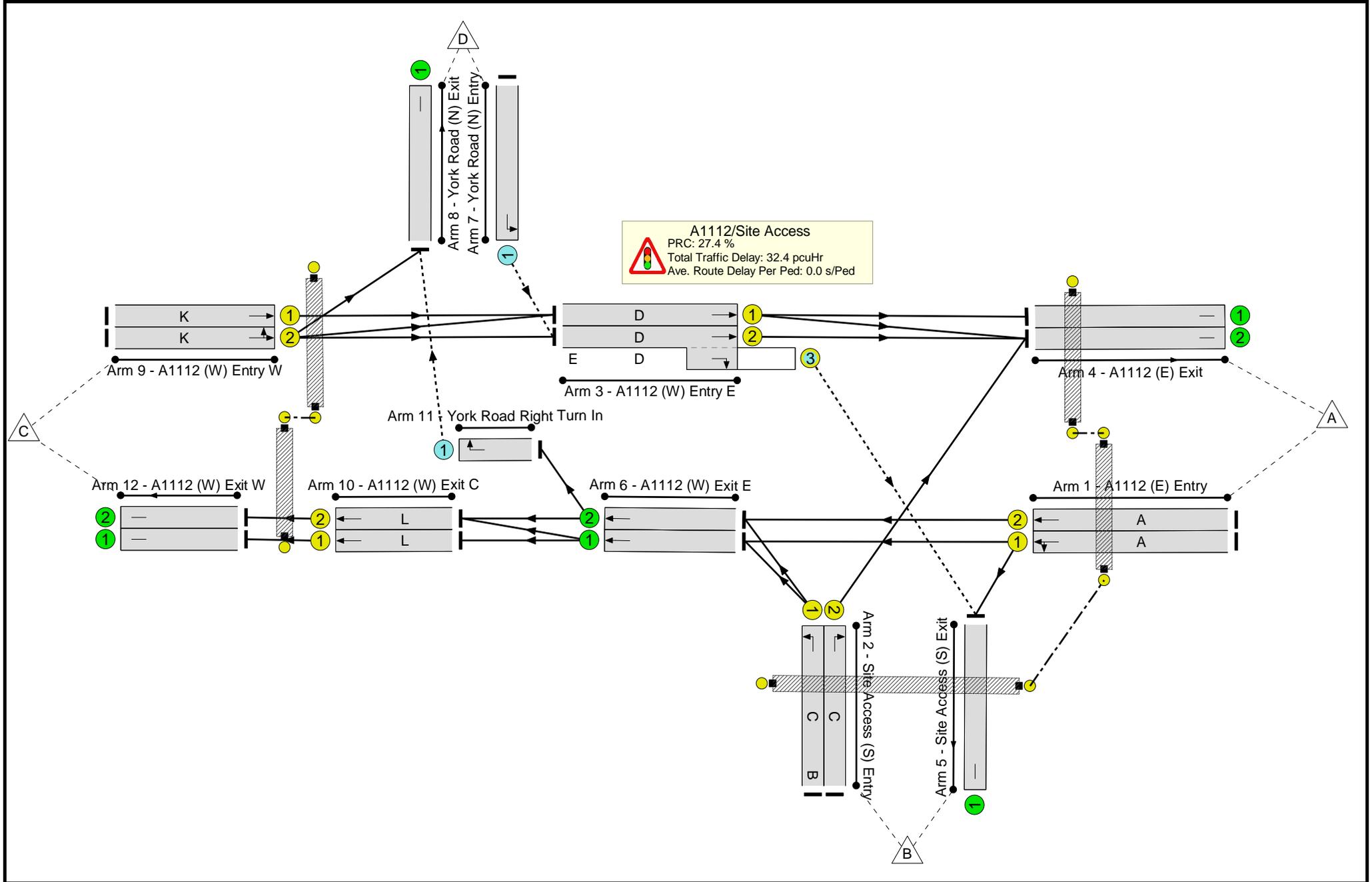
Stage Timings

Stage	1	2	3	4
Duration	57	17	7	6
Change Point	0	72	94	106

Signal Timings Diagram



Full Input Data And Results
Network Layout Diagram



Full Input Data And Results

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A1112/Site Access Junction	-	-	N/A	-	-		-	-	-	-	-	-	70.7%
A1112/Site Access	-	-	N/A	-	-		-	-	-	-	-	-	70.7%
1/1	A1112 (E) Entry Left Ahead	U	N/A	N/A	A		1	57	-	590	1922	929	63.5%
1/2	A1112 (E) Entry Ahead	U	N/A	N/A	A		1	57	-	655	2105	1017	64.4%
2/1	Site Access (S) Entry Left	U	N/A	N/A	C	B	1	29	0	183	1687	422	43.4%
2/2	Site Access (S) Entry Right	U	N/A	N/A	C		1	29	-	322	1830	457	70.4%
3/1	A1112 (W) Entry E Ahead	U	N/A	N/A	D		1	65	-	581	1915	1053	55.2%
3/2+3/3	A1112 (W) Entry E Ahead Right	U+O	N/A	N/A	D	E	1	65	57	656	2055:1808	1139	57.6%
4/1	A1112 (E) Exit	U	N/A	N/A	-		-	-	-	581	1915	1915	30.3%
4/2	A1112 (E) Exit	U	N/A	N/A	-		-	-	-	928	2055	2055	45.2%
5/1	Site Access (S) Exit	U	N/A	N/A	-		-	-	-	138	1965	1965	7.0%
6/1	A1112 (W) Exit E Ahead	U	N/A	N/A	-		-	-	-	547	1965	1965	27.8%
6/2	A1112 (W) Exit E Ahead Ahead2	U	N/A	N/A	-		-	-	-	793	2105	2105	37.7%
7/1	York Road (N) Entry Left	O	N/A	N/A	-		-	-	-	30	1572	318	9.4%
8/1	York Road (N) Exit	U	N/A	N/A	-		-	-	-	30	1965	1965	1.5%
9/1	A1112 (W) Entry W Ahead	U	N/A	N/A	K		1	100	-	64	1965	1654	3.9%

Full Input Data And Results

9/2	A1112 (W) Entry W Ahead Left	U	N/A	N/A	K		1	100	-	1158	2105	1772	65.4%
10/1	A1112 (W) Exit C Ahead	U	N/A	N/A	L		1	100	-	73	1965	1654	4.4%
10/2	A1112 (W) Exit C Ahead	U	N/A	N/A	L		1	100	-	1252	2105	1772	70.7%
11/1	York Road Right Turn In Right	O	N/A	N/A	-		-	-	-	15	1830	358	4.2%
12/1	A1112 (W) Exit W	U	N/A	N/A	-		-	-	-	73	1965	1965	3.7%
12/2	A1112 (W) Exit W	U	N/A	N/A	-		-	-	-	1252	2105	2105	59.5%
Ped Link: P1	A1112 (E) WB	-	N/A	-	F		1	43	-	0	-	0	0.0%
Ped Link: P2	A1112 (E) EB	-	N/A	-	G		1	7	-	0	-	0	0.0%
Ped Link: P3	Site Access (SB)	-	N/A	-	H		1	9	-	0	-	0	0.0%
Ped Link: P4	A1112 (W) WB	-	N/A	-	I		1	7	-	0	-	0	0.0%
Ped Link: P5	A1112 (W) EB	-	N/A	-	J		1	7	-	0	-	0	0.0%

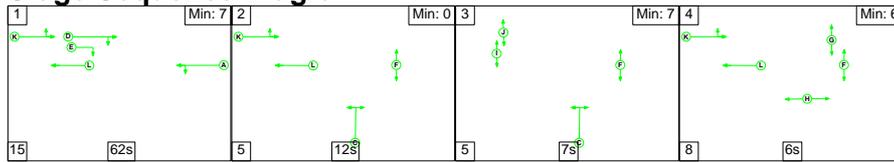
Full Input Data And Results

Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
C1		PRC for Signalled Lanes (%):	27.4	Total Delay for Signalled Lanes (pcuHr):		30.39	Cycle Time (s):		120				
		PRC Over All Lanes (%):	27.4	Total Delay Over All Lanes(pcuHr):		32.42							

Full Input Data And Results

Scenario 2: '2031 AM Peak' (FG2: '2031 AM Peak', Plan 1: 'Network Control Plan 1')

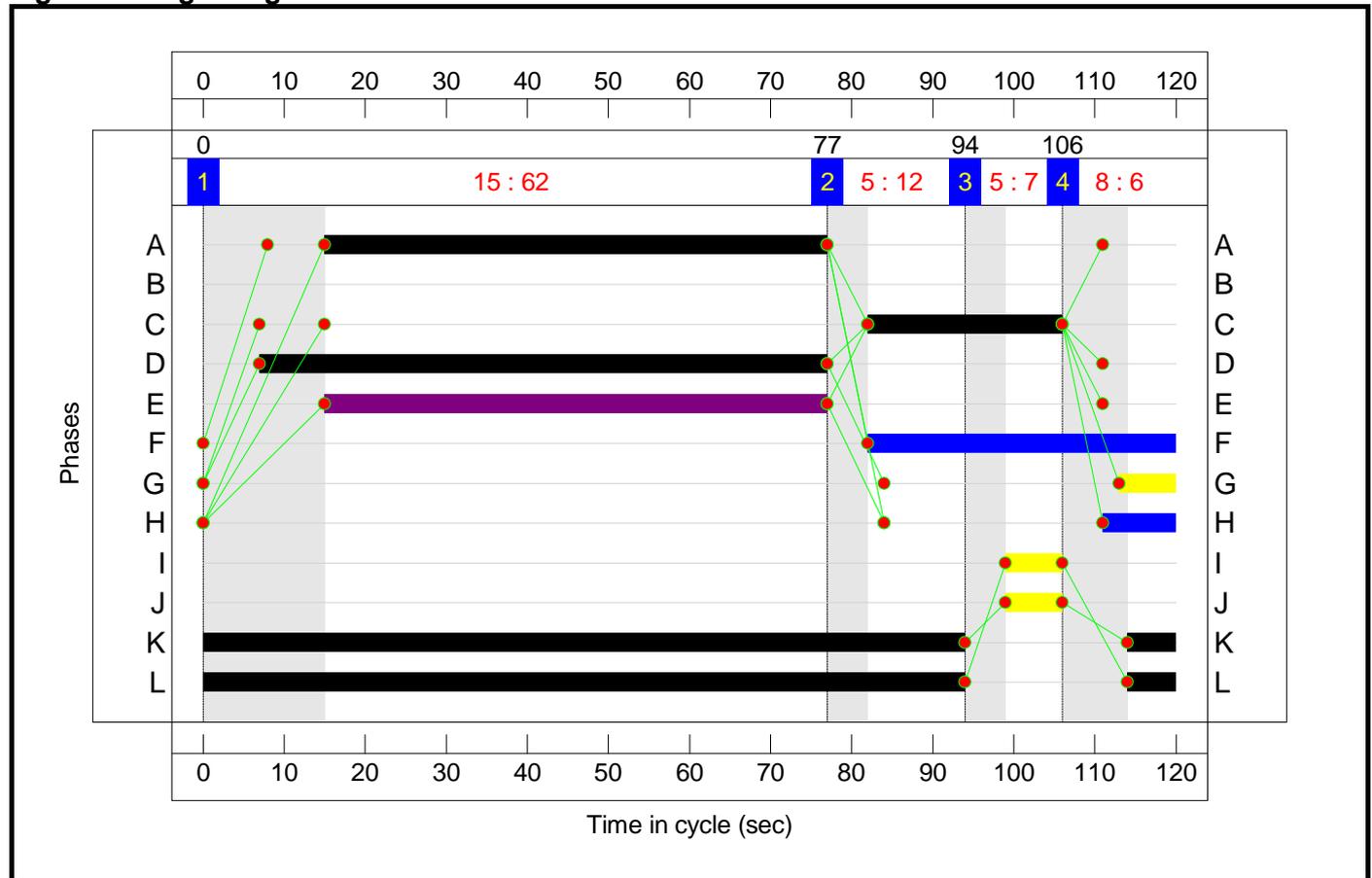
Stage Sequence Diagram



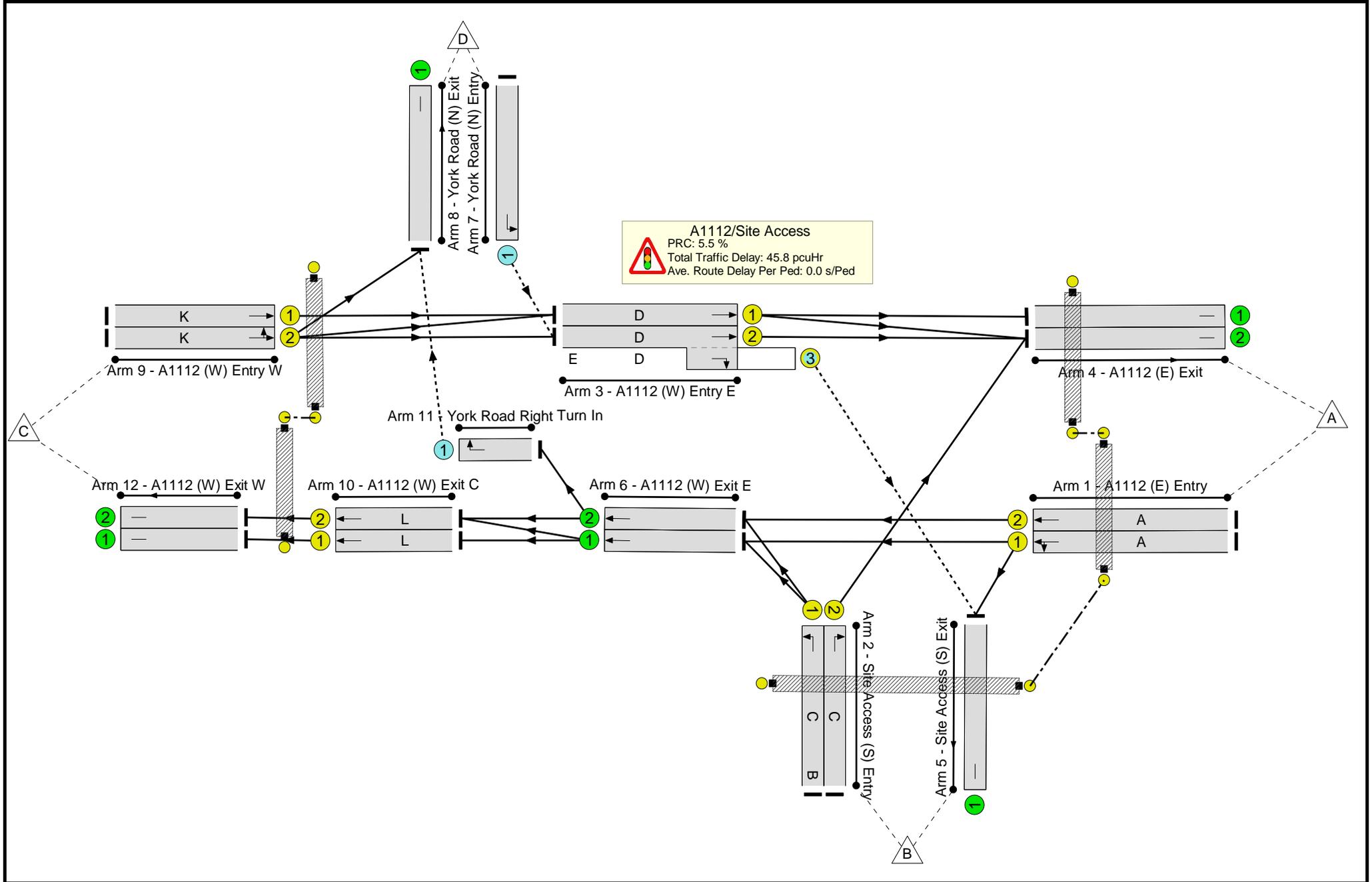
Stage Timings

Stage	1	2	3	4
Duration	62	12	7	6
Change Point	0	77	94	106

Signal Timings Diagram



Full Input Data And Results
Network Layout Diagram



Full Input Data And Results

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A1112/Site Access Junction	-	-	N/A	-	-		-	-	-	-	-	-	85.3%
A1112/Site Access	-	-	N/A	-	-		-	-	-	-	-	-	85.3%
1/1	A1112 (E) Entry Left Ahead	U	N/A	N/A	A		1	62	-	722	1930	1013	71.3%
1/2	A1112 (E) Entry Ahead	U	N/A	N/A	A		1	62	-	794	2105	1105	71.8%
2/1	Site Access (S) Entry Left	U	N/A	N/A	C	B	1	24	0	183	1687	351	52.1%
2/2	Site Access (S) Entry Right	U	N/A	N/A	C		1	24	-	322	1830	381	84.5%
3/1	A1112 (W) Entry E Ahead	U	N/A	N/A	D		1	70	-	712	1915	1133	62.8%
3/2+3/3	A1112 (W) Entry E Ahead Right	U+O	N/A	N/A	D	E	1	70	62	800	2055:1808	1225	65.3%
4/1	A1112 (E) Exit	U	N/A	N/A	-		-	-	-	712	1915	1915	37.2%
4/2	A1112 (E) Exit	U	N/A	N/A	-		-	-	-	1072	2055	2055	52.2%
5/1	Site Access (S) Exit	U	N/A	N/A	-		-	-	-	138	1965	1965	7.0%
6/1	A1112 (W) Exit E Ahead	U	N/A	N/A	-		-	-	-	679	1965	1965	34.6%
6/2	A1112 (W) Exit E Ahead Ahead2	U	N/A	N/A	-		-	-	-	932	2105	2105	44.3%
7/1	York Road (N) Entry Left	O	N/A	N/A	-		-	-	-	30	1572	249	12.1%
8/1	York Road (N) Exit	U	N/A	N/A	-		-	-	-	30	1965	1965	1.5%
9/1	A1112 (W) Entry W Ahead	U	N/A	N/A	K		1	100	-	77	1965	1654	4.7%

Full Input Data And Results

9/2	A1112 (W) Entry W Ahead Left	U	N/A	N/A	K		1	100	-	1420	2105	1772	80.1%
10/1	A1112 (W) Exit C Ahead	U	N/A	N/A	L		1	100	-	85	1965	1654	5.1%
10/2	A1112 (W) Exit C Ahead	U	N/A	N/A	L		1	100	-	1511	2105	1772	85.3%
11/1	York Road Right Turn In Right	O	N/A	N/A	-		-	-	-	15	1830	290	5.2%
12/1	A1112 (W) Exit W	U	N/A	N/A	-		-	-	-	85	1965	1965	4.3%
12/2	A1112 (W) Exit W	U	N/A	N/A	-		-	-	-	1511	2105	2105	71.8%
Ped Link: P1	A1112 (E) WB	-	N/A	-	F		1	38	-	0	-	0	0.0%
Ped Link: P2	A1112 (E) EB	-	N/A	-	G		1	7	-	0	-	0	0.0%
Ped Link: P3	Site Access (SB)	-	N/A	-	H		1	9	-	0	-	0	0.0%
Ped Link: P4	A1112 (W) WB	-	N/A	-	I		1	7	-	0	-	0	0.0%
Ped Link: P5	A1112 (W) EB	-	N/A	-	J		1	7	-	0	-	0	0.0%

Full Input Data And Results

Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
C1		PRC for Signalled Lanes (%):		5.5	Total Delay for Signalled Lanes (pcuHr):		42.33	Cycle Time (s):		120			
		PRC Over All Lanes (%):		5.5	Total Delay Over All Lanes(pcuHr):		45.85						

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Report

Appendix E
Technical /
Environmental
Appraisal



1.0. Geo-Environmental

1.1 Introduction

This geo-environmental section presents a summary of the contamination status of the site, with respect to constraints for development. The current approved scheme boundary is much smaller than the original landfilled area, which extends beneath the playing fields [currently in the ownership of Havering] located beyond the SE site boundary. For the purposes of this report, the playing fields have been included.

1.2 Site History

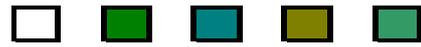
The site has been the subject of localised ad hoc sand and gravel (Drift Flood Plain gravels) extraction over the centuries. Early Ordnance Survey plans dated 1860's show the agricultural use of the site and the presence of an old gravel pit in the middle of the current site. The 1939 Ordnance Survey plan shows commercial gravel exploitation in the central northern part of the site which extends across the entire site by the late 1950's. The resultant void was infilled with general undefined waste materials between 1961- 1969.

The subsequent restoration of the site was insufficient and the site was noted as being an "eyesore". Planning permission [P0186.93] was therefore granted on appeal in 1995 and an Environment Agency waste management license [EAWML 80124] issued in 1996 to allow the site to be restored by extensively raising the ground levels with inert materials in accordance with waste management licensing and recontouring the site to create an informal amenity landform for use by local people. The filling ceased in late 2003 and the site remained dormant. Extensive discussions with both the local authority and the Environment Agency [EA] to vary some of the original conditions within the waste management license/planning consent were successful. A s73 planning permission was granted in July 2010 [P0432.10 and updated in 2014 ref: P0455.14] and an environmental permit was issued by the EA in 2010 [EPR/QP3196NT] to allow the final phase of restoration of the site, which started in April 2011 and will be completed in 2017.

1.3 Ground Conditions

At depth the site is underlain by Chalk, which is protected by the overlying thickness of impermeable London Clay. The overlying Taplow Gravels (sands and gravels) have been commercially exploited at the site and were then replaced by a variable infill in the 1960's and a separate controlled restoration phase which is nearing completion.

The site has been restored using chemically inert soils from sources that provide, in advance of being accepted, both chemical and geotechnical certification to demonstrate that they are inert and suitable and are within agreed acceptance criteria. The quality of the imported restoration soils has been specified by the Environment Agency's defined acceptance criteria within the licensing of the restoration process and the quality of the imported material continues to be monitored by an independent third party and also by the EA. The restoration soils are geotechnically suitable materials broadly classified as semi-impermeable. The thickness of restoration materials deposited



across the site varies from 12m to 1m deep. The deep thickness of restoration grade soils will allow the site profile to be changed if required to accommodate any new development proposal. The implications of this means that development can proceed without encountering the underlying 1960's landfill material and without the need to mitigate human health issues and associated high abnormal development costs.

1.4 Regulatory Compliance

The licensed restoration works were principally directed towards mitigating potential human health and environmental issues and have been undertaken using restoration materials.

In line with the EA licensing obligations the site has been, and continues to be, independently monitored on a monthly basis to check for any impact to groundwater quality and to measure any gases that are produced from the original 1960's landfill using purpose installed boreholes around the perimeter of the site. In addition, on an annual basis, the water quality in the River Beam is checked from positions up and downstream of the site to determine whether there is any impact. The detailed site data obtained from this monitoring has formed the basis of extensive discussions with both the local authority and the Environment Agency and has provided the technical justification to vary some of the original conditions within the waste management license/planning consent. For example, in the 1993 original approved scheme and in the EA license, a mitigation measure of a clay cap placed over the entire site was deleted which means that runoff in periods of heavy rain will not create issues with regards potential localised flooding.

Ground gas concentrations and flow rate monitoring continues to be undertaken in the perimeter boreholes using a portable landfill gas analyser with integrated flow cell which is verified by laboratory testing of gas samples on a specified regular basis. The gas data is assessed against target concentrations of carbon dioxide, methane and flow rate and reported to the EA. The ground gas data revealed that generally the 50+ year old fill from the 1960's was not generating significant concentrations and flows. However, in a small section of boundary immediately adjacent to the rear gardens of Thorogood Way, the ground gas data revealed elevated concentrations and variable sporadic flow rates in 5 boreholes.

Havering Borough commissioned an independent investigation by Enviros Ltd in 2009 [report ref: Can: LO0720009, 090915 Sept 2009] to establish whether ground gas was migrating from the site into the gardens and beyond at the NE boundary of the site. Monitoring of the 15 boreholes in the rear gardens of Thorogood Way did not reveal any 1960's waste materials under the extended gardens and did not measure significant ground gas concentrations or flows and concluded that significant gas migration from the site was not occurring and "the area classified as "Green" when assessed against the conservative CIRIA assessment for proposed residential development."

Nevertheless, as a contingency, a vent trench was installed [together with monitoring boreholes] along a length of the site perimeter which includes the 5 boreholes and is in the vicinity of the rear gardens of 5-17 Thorogood Way. [Plan – Figure 11]. The purpose of this vent trench is to intercept any ground gas that may migrate offsite towards the gardens of Thorogood Way. However, throughout the restoration process there has been no human health ground gas risk demonstrated.



The implications for development on the site would be that standard brownfield precautionary gas protection measures are incorporated in the building design following discussions with the authorities.

Groundwater quality monitoring has been and continues to be undertaken on six selected “compliance” representative perimeter boreholes in accordance with the EA permit requirements; groundwater samples are submitted for laboratory testing to an agreed suite of determinands to check for any deterioration in quality against target concentrations for key determinands. The results have shown that the 1960’s fill has generally had a limited impact on groundwater quality and that the situation has not deteriorated over time even during the placement of the overlying inert materials. There have been sporadic episodes of exceeding some target concentrations, in isolated positions such as roughly half way along, adjacent to the ditch on the eastern boundary. Trial pit investigations in the vicinity of the boreholes demonstrating these sporadic exceedences did not reveal any obvious source[s]. The implication of these results will involve discussions with the EA who will likely require assessment and technical justification for long term options associated with the surrender of the Environmental permit.

Environmental permit surrender will be undertaken following completion of the restoration works and supplying the technical justification based on the monitoring data and detailed risk assessments to demonstrate that the site is not having an unacceptable environmental impact. The EA have indicated that they will require a period of two years monitoring post completion of the restoration of the site. Detailed discussions will be undertaken during that time to establish the lines of evidence required to satisfy their requirements and facilitate surrender of the license.

1.5 Hydrogeological Setting

The site lies at the side of a shallow river valley, one of several (the Roding, Beam and Ingrebourne) that trend north-southwards towards the main Thames west-east erosion channel. Most of these river valleys have an incised V-shape central section, with substantial granular outwash (sand and gravel) deposits and later more clayey Head and Brickearth deposits, before recent fluvial Alluvial deposits on river sides. The sands/gravels and the Brickearth deposits have been exploited historically, for aggregate and brick-making respectively.

The site actually sits between two historical north-south geologically incised valleys or ‘channels’, one occupied by the River Beam (and extending miles upstream) and a much smaller one on the eastern perimeter, which is a shallow incision that peters out at the northern extent of the landholding (beyond A125, Rainham Road). The eastern incised valley contains a low lying ephemeral ditch/stream which discharged to a piped/open ditch system, flowing southward towards the Thames estuary (picking up highway discharges en-route).

The commercial exploitation of the sands and gravels are likely to have used grab-line methods to excavate the granular material down to the London Clay surface, and to follow these inclines in the natural direction and thereby removing almost all from the centre of the site, but leaving granular



material in place beneath the western and eastern 'valleys' and also adjacent to the (dry) northern and southern land boundaries – which is confirmed by the 1995 perimeter boreholes.

It is these more permeable perimeter zones, and the impermeable Clay beneath the whole site, which govern the hydrogeological trends from permeating rainfall, directing the majority of underground flows around the perimeter and towards the River Beam channel. There will also be a subsidiary much smaller groundwater flow regime towards the eastern boundary and the south-east corner; underlying geological features suggest that this 'underflow' will eventually find a route southwards to join the flood plain of the Thames, if not artificially captured by man-made drainage.

There is no abstraction of these near-surface groundwaters in this area, but there is deep potable water abstraction from the Chalk strata underneath the London Clay. There is, however, no known vertical connectivity between the site and the Chalk aquifer, in rational geological or man-made terms, due to the inherent thickness of London Clay present.

Groundwater monitoring at the boreholes around the perimeter and in the centre of the site have shown that where gravels are still present, such as at the perimeter of the site; groundwater levels were variable from an average of 2m depth in the dry months to an average of 1m depth in the wet months. In the restoration soils, groundwater was found to be highly variable perched groundwater [i.e. discontinuous and often dry].

The implications of this situation from a development perspective are that recontouring of the ground to achieve required development formation levels should not encounter significant groundwater; nor should excavations require dewatering with the exception of those in the residual gravels at the periphery of the site, where inflows would be more likely especially in the winter. The nature of the restoration soils is likely to accommodate infiltration and hence SUDS is a likely opportunity associated with development of the site.

1.6 Hydrological Setting

From a hydrological perspective, a number of licensed discharges empty into the River Beam, the closest being a Consent for Essex & Suffolk Water Plc to discharge "Miscellaneous discharge" immediately to the north-west of the site.

The channel or ditch located along the eastern boundary of the site [described earlier] is typically be marshy for extended periods of the year and during heavy periods of precipitation, standing water has been noted in this area.

The River Beam flood plain, located on the western boundary of the site is shown to be within Flood Zones 2 and 3 on EA published plans. These flood zones also are shown to affect the southern end of the channel/ditch located on the eastern site boundary. The actual situation will be confirmed through discussion with the EA.

Such an indicative floodplain is defined as an area where there is a significant risk of flooding: the chance of flooding in any year is greater than 1.3% (1 in 75). The mitigating factors are that the site



is elevated with respect to the floodplain and the Thames tidal walls act as the first line of defence for much of the land to the south of this site, which is defined as being in Zone 3.

The implications of the proximity of Flood zones 2 and 3 to the south and in the south-eastern corner of the site with regards development of the site will be a material consideration in the design of the site drainage and determining suitable formation levels.

1.7 Summary and Conclusions

The site will be fully restored and ready for development without the need for remediation. The deep thickness of restoration grade soils [suitable inert material, which should be well consolidated] will allow the site profile to be changed if required to accommodate new development proposals. The implications of this means that development can proceed without encountering the underlying 1960's landfill material and without the need to mitigate human health issues and associated high abnormal development costs.

In line with the EA licensing obligations the site has been, and continues to be, independently monitored on a monthly basis to check for any impact to groundwater quality and to measure any gases that are produced from the original 1960's landfill using purpose installed boreholes around the perimeter of the site. In addition, on an annual basis, the water quality in the River Beam is checked from positions up and downstream of the site to determine whether there is any impact, none of which has been found.

The ground gas data revealed that generally the 50+ year old fill from the 1960's was not generating significant concentrations and flows. However, in a small section of boundary immediately adjacent to the rear gardens of Thorogood Way, the ground gas data revealed elevated concentrations and variable sporadic flow rates in 5 boreholes. As a contingency, a vent trench was installed [together with monitoring boreholes] along a length of the site perimeter which includes the 5 boreholes and is in the vicinity of the rear gardens of 5-17 Thorogood Way. The purpose of this vent trench is to intercept any ground gas that may migrate offsite towards the gardens of Thorogood Way. However, throughout the restoration process there has been no human health ground gas risk demonstrated. The implications for development on the site would be that standard brownfield precautionary gas protection measures are incorporated in the building design following discussions with the authorities.

Groundwater monitoring results have shown that the 1960's fill has generally had a limited impact on groundwater quality and that the situation has not deteriorated over time even during the placement of the overlying inert materials. There have been sporadic episodes of exceeding target concentrations, primarily NH₄ and TPH in isolated positions such as one borehole located roughly half way along, adjacent to the ditch on the eastern boundary. Trial pit investigations in the vicinity of the boreholes demonstrating these sporadic exceedences did not reveal any obvious source[s]. The implication of these results will involve discussions with the EA who will likely require assessment and technical justification for long term options associated with the surrender of the Environmental permit.



Environmental permit surrender will be undertaken following completion of the restoration works. Detailed discussions will be undertaken during that time to establish the technical justification based on the monitoring data and detailed risk assessments and other lines of evidence needed to satisfy their requirements to demonstrate that the site is not having an unacceptable environmental and facilitate surrender of the license. This process can be undertaken in parallel with any development options. The outstanding planning conditions will also need to be discharged.

Groundwater monitoring at the boreholes around the perimeter and in the centre of the site have shown that where gravels are still present, such as at the perimeter of the site; groundwater levels were variable from an average of 2m depth in the dry months to an average of 1m depth in the wet months. In the restoration soils, groundwater was found to be highly variable perched groundwater [i.e. discontinuous and often dry]. The implications from a development perspective are that recontouring of the ground to achieve required development formation levels should not encounter significant groundwater; nor should excavations require dewatering with the exception of those in the residual gravels at the periphery of the site, where inflows would be more likely especially in the winter. The nature of the restoration soils is likely to accommodate infiltration and hence SUDS is a likely opportunity associated with development of the site

The implications of the proximity of Flood zones 2 and 3 to the south and in the south-eastern corner of the site with regards development of the site will be a material consideration in the design of the site drainage and determining suitable formation levels. . The actual situation will be confirmed through discussion with the EA.

Ecological Deliverability Report

Mardyke farm, Dagenham

Ebcliff Ltd

March 2015

Report status	Date	Prepared by	Authorised
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Figure 1: Location Plan

Figure 2: Pre-restoration Phase 1 Habitat plan and Target notes

Appendices

Appendix 1: Designated sites of nature conservation value

Appendix 2: Species legislation and conservation status

Appendix 3: Pre-restoration species list

Appendix 4: Pre-restoration site photographs

1 Introduction

1.1 *Introduction*

EAD was commissioned by Ebcliff to prepare an Ecological Deliverability Report for land at Mardyke Farm, Dagenham, Essex (approximate central NGR TQ 509836; refer to Figure 1; hereafter 'the site'). The site is being promoted for residential development in the Havering Local Plan. The report details the ecological baseline for the site and considers the suitability of the site for future residential development. Indicative Masterplans for the site are contained in 'A Vision of Mardyke Farm, Havering' (Studio Egret Way 2015).

The work was undertaken by members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and in accordance with CIEEM's Code of Practice.

1.2 *Background*

The site comprises an inert landfill that is currently being restored in accordance with planning and Environment Agency waste management licensing obligations. Works include re-contouring the majority of the site to achieve the approved landform followed by landscaping and ecological enhancement. In the report, ecological conditions prior to the current restoration being commenced are referred to as 'pre-restoration'. The future baseline (following completion of the restoration) is referred to as 'post-restoration'.

1.3 *Approach*

The pre-restoration ecological baseline of the site was derived from desk study and ecological site surveys undertaken in 2008-10. The post-restoration ecological baseline was obtained with reference to the approved Landscape and Ecological Management Plan (EAD 2010) (hereafter 'LEMP') for site restoration.

1.3.1 *Desk study*

Biodiversity information was requested for a study area of 2km radius around the site (extended to 5km for previous records of bats) from Greenspace Information for Greater London. Information requested included the location and details of the following:

- designated sites of nature conservation value (extended to 15km for European Protected Sites, using MAGIC);
- previous records of protected and/or notable species, including Species of Principal Importance for Conservation in England ('Priority Species') and London and Havering Biodiversity Action Plan (BAP) Species.

Information was also obtained from the following websites:

- www.magic.gov.uk – information on protected sites; and
- www.naturalengland.co.uk – information on protected sites, Natural Area profiles and BAP Priority Habitats. .

The London and Havering BAPs were also reviewed.

1.3.2 *Pre-restoration site surveys*

An Extended Phase 1 Habitat survey of the site was undertaken on 14 and 15 July 2008, following Institute of Environmental Assessment Guidelines (1995) and JNCC Methodology (1993). This identified the habitats on the site and the presence/potential presence of protected or otherwise notable¹ species. The results of the survey were detailed on a Phase 1 Habitat plan. Target notes were used to identify specific features of ecological interest and a botanical species list was recorded, although no attempt was made to record every plant species on the site. There were no significant limitations on the results of the survey.

Surveys were undertaken during April-June 2010 to determine the presence/absence of great crested newt from seven ponds/ditches within and in the vicinity of the site. The surveys were undertaken according to Natural England Guidelines (English Nature 2001) and involved the use of three survey methodologies carried out over four site visits. As great crested newt were recorded within the ditch on the eastern boundary of the site, a further two site visits were undertaken to provide an estimate of population size.

A survey to determine the presence of reptiles on the site was undertaken following standard methodology (English Nature 1994; Froglife 1999). This involved deploying 300 artificial refugia (roofing felt tiles) across the site. The tiles were deployed in April 2011 and survey visits during May and early June 2011.

¹ Notable species are those which hold a specific conservation status e.g. Priority Species.

2 Ecological baseline

2.1 **Designated sites of nature conservation value**

2.1.1 *Statutory designations*

There are no statutory designations within the site although there are several within the 2km study area. These comprise two Sites of Special Scientific Interest (SSSI) and five Local Nature Reserves (LNR; refer to Appendix 1). The nearest SSSI is Ingrebourne Marshes, which is approximately 1.25km to the east of the site boundary. This was designated for freshwater marshland habitat and the presence of notable invertebrates and birds. The nearest LNR is Beam Valley, which is adjacent to the western site boundary. This was designated for its running water and associated wet grassland and ditches, which support a water vole population.

Epping Forest Special Area of Conservation (SAC) was the only European site within 15km of the site boundary and occurred approximately 11.7km to the north west. This was designated for its nationally outstanding assemblage of invertebrates, a major amphibian interest and an exceptional breeding bird community.

2.1.2 *Non statutory designations*

There are no non-statutory designations within the site although there are several within the 2km study area including 18 Sites of Importance for Nature Conservation (SINC) and two London Wildlife Trust reserves (refer to Appendix 1). The nearest SINC is Beam Valley South in Havering (HvBI17), which is adjacent to the western site boundary and is part of Beam Valley LNR.

2.2 **Habitats**

2.2.1 *Pre-restoration habitats*

Prior to commencement of restoration, the site comprised a mosaic of typical 'brown field' habitats. The majority of habitats were the result of natural colonisation of imported materials, including tall ruderal, ephemeral/short perennial, and dense and scattered scrub. In the central parts of the site these habitats were generally recently established; longer established habitats including semi-improved neutral grassland, and standing water were present around the site margins. Mature trees were recorded close to the western boundary. Other habitats recorded on site included bare ground, introduced scrub and swamp. The location of habitats within the site pre-restoration is shown on Figure 2. Appendix 3 lists the species including their scientific names; nomenclature follows Stace (1997). Photographs of the site pre-restoration are provided in Appendix 4.

2.2.2 *Post-restoration habitats (future baseline)*

The ecological objectives of the LEMP were as follows:

- maintain and enhance the great crested newt population associated with the ditches on the eastern boundary;
- retain the mature trees on the western side of the site, which provide suitable bat roosting habitat;
- retain the reptile population within the site;
- create sparse grassland to provide suitable habitat for ground-nesting birds and specialist invertebrates; and
- retain the presence of features such as sand banks, rubble piles, disturbed and sparsely vegetated ground and species-rich unmanaged tall-herb communities, which provide suitable habitat for invertebrates, including notable species.

In the approved restoration proposals, the majority of site would comprise open habitats, including wildflower meadow and sparse wildflower grassland with areas of mixed native scrub/trees and scrub-grassland mosaic. Scrapes, bare ground, low terraces/embayments and rubble piles would also be created.

2.2.3 *Surrounding habitats*

To the north, east and south of the site there was urban habitat, including residential development and roads. There was also amenity grassland (playing field) adjacent to the southern boundary. To the west there was the River Beam and adjacent fields, including ditches and wet grassland (refer to Section 2.1).

2.3 ***Protected and notable species²***

A number of protected and/or notable species were identified by the desk study in the 2km study area or were recorded on the site during the surveys, as summarised below. The legislation and conservation status that applies to the species listed is provided in Appendix 2.

2.3.1 *Plants*

Desk study

Notable plants recorded in the study area are black poplar, which is a Priority Species under the London BAP and bluebell, which is legally protected from Sale.

Site survey

Japanese knotweed, giant hogweed and New Zealand pigmyweed, which are legally prohibited from planting or otherwise causing to grow in the wild, were recorded within

² The legislation and conservation status for the species listed is detailed in Appendix 3

the site. A programme to eradicate these invasive plant species from the site is being implemented and it is likely that they will no longer be present following completion of the restoration.

2.3.2 *Invertebrates*

Desk study

Notable invertebrates recorded in the study area include the following Priority Species and London BAP Priority Species:

- Stag beetle.
- 5-banded tailed digger wasp.
- Small heath butterfly.
- Mullein wave moth.
- Lackey moth.
- Cinnabar moth.

Site survey

Notable invertebrates recorded during pre-restoration site surveys were small heath butterfly and cinnabar moth. The site also provided suitable habitat for other notable invertebrates and the presence of such species was considered highly likely. The East Thames region is of national importance for invertebrates and waste ground and brown field sites in this region are known to support diverse invertebrate assemblages, including many Nationally Notable species. Features on the site that suggested it was of high value for invertebrates included unmanaged flower-rich habitats, sparsely vegetated ground and areas of exposed substrate and disturbed ground. Habitat for notable invertebrates was included in the post-restoration LEMP.

2.3.3 *Amphibians*

Desk study

Great crested newt, smooth newt and common frog have been recorded in the study area. Great crested newt is fully protected by UK and European legislation, and is a Priority Species, and London and Havering BAP Species. Smooth newt and common frog are legally protected from Sale.

Site survey

A 'small' population of great crested newt was recorded during the 2010 survey in a section of ditch on the eastern boundary of the site. Great crested newt (GCN) was absent elsewhere on the site and in immediately adjacent habitat. GCN are known to occur within the adjacent Beam Valley LNR, although the population in the LNR is effectively isolated from the site due to the barrier created by Beam River, which is several metres wide and has vertical banks over 1m high adjacent to the site.

A GCN translocation from habitats affected by the restoration works was undertaken in 2011 under a Natural England Development Licence. No GCN were found during the translocation, which is likely to be due to the sub-optimal nature of the affected habitats. The breeding pond and the key areas of terrestrial habitat in the east of the site are being retained and enhanced during site restoration and the value of this area for GCN is likely to improve.

2.3.4 *Reptiles*

Desk study

Slow-worm, grass snake and common lizard have been recorded within the study area. All native reptiles are legally protected and are Priority Species and London BAP Species. Slow-worm is a Priority Species under the Havering BAP.

Site survey

A 'low' population of grass snake and common lizard were recorded on site pre-restoration and the habitats within the site provided suitable foraging, sheltering and hibernating habitat for reptiles. A translocation was undertaken in 2011 and reptiles were captured and moved to retained habitats around the perimeter of the site.. Habitat retention and creation for reptiles was included in the restoration proposals (e.g. scrub/grassland mosaic).

2.3.5 *Birds*

Desk study

Notable birds have been recorded in the study area including seven species that are legally protected by special penalties (i.e. Schedule 1 species), 14 London BAP Priority Species and six RSPB Red List species. A summary of these records is provided in Table 1 below. All birds and their eggs, nests and young are legally protected.

Table 1: Summary of notable birds recorded in the study area.

Species	Schedule 1 ³	Priority Species	London BAP	Havering BAP	RSPB Red List
Black redstart	X		X		
Black-necked grebe	X				
Common tern		X	X		
Dunnock		X	X		
Fieldfare	X				

³ Species listed on Schedule 1 of the Wildlife and Countryside Act (1981) (as amended).

Species	Schedule 1 ³	Priority Species	London BAP	Havering BAP	RSPB Red List
Green sandpiper	X				
Grey partridge		X	X		X
Herring gull			X		
House sparrow		X	X		X
Kingfisher	X				
Lapwing		X	X		
Linnet		X	X		X
Little ringed- plover	X				
Peregrine	X		X		
Song thrush		X	X	X	X
Starling		X	X		X
Turtle dove		X	X		X
Yellow hammer		X	X		X
Yellow wagtail			X		

Site survey

Notable birds recorded during the survey included linnet, skylark, grey partridge, starling, house sparrow and dunnock and it is likely that several of these species, including skylark, which is a Priority Species and Havering BAP Species, breed on the site. Potential nesting habitat included short vegetation, which is likely to be used by ground nesting species, and trees and shrubs. The presence of specifically protected (Schedule 1) birds as breeding species was considered unlikely. The restoration proposals included habitat for notable birds, including mixed native scrub and short-vegetation suitable for ground nesting species.

2.3.6 *Mammals*

Desk study

Serotine, Daubenton's, Leisler's, noctule and pipistrelle bats have been recorded in the study area. All bats and their roosts are fully protected under UK and European legislation and some are Priority Species under the London and Havering BAPs. Water vole, which is legally protected and a Priority Species and London and Havering BAP Species, and hedgehog, which is a Priority Species and London BAP Species have been recorded from the study area.

There are no records of otter or hazel dormice from the study area. These species are fully protected by UK and European legislation and are Priority Species and London BAP Species. There also are no records of badger, which is legally protected, from the study area.

Site survey

The mature trees provided potential roosting habitat for bats and several holes (e.g. old woodpecker holes) were noted. The site provided potential foraging and travelling habitat for bats although the lack of potential flight-lines in the central part of the site suggested that this area is likely to be of limited value. No evidence of badger was found and the site provided sub-optimal foraging habitat. The River Beam provided potential habitat for otters and it is possible that scrub within and adjacent to the site is used as a laying-up site. No potential habitat for a natal holt was recorded within the site. The site and adjacent habitats provided potential habitat for hedgehog. The standing water and swamp habitats within the site were considered unsuitable for water vole due to the limited depth and extent of water. No evidence of badger was found.

The mature trees with bat potential were retained within the restoration scheme. . The value of the site for otter, badger, hedgehog and water vole is likely to remain unchanged post-restoration.

3 Ecological deliverability of the site

3.1 *Suitability of the site for development*

3.1.1 *Ecological constraints and opportunities*

There are no over-riding ecological constraints to future residential development of the site in accordance with the principles set out in 'A Vision for Mardyke Farm'. None of the designated sites of nature conservation value in the vicinity would be directly impacted by the proposed works so their presence is considered unlikely to be a significant constraint. There is an opportunity to create a buffer along the west of the site which would avoid potential direct impacts to the Beam Valley LNR and indirect impacts (e.g. noise, visual disturbance and run-off) could be mitigated through appropriate timing of works, visual screening and sustainable site drainage as appropriate. With appropriate habitat creation within an 'ecological buffer' (as per 'A Vision for Mardyke Farm'), there would also be an opportunity to extend the habitats within the LNR into the site.

Epping Forest SAC occurred approximately 11.7km to the north west of the site. It is considered highly unlikely that potential adverse impacts would occur on this designated site from the proposed development e.g. recreation impacts.

3.1.2 *Ecological design principles*

The key ecological design principles that have informed 'A Vision for Mardyke' and would inform any future development proposals are detailed below.

- Retention and enhancement of significant areas of wildlife habitats, including Priority Habitats, and London BAP Habitats within Public Open Space on the site. The function of these areas would be as follows:
- to provide an 'ecological buffer' between the site and the adjacent Beam Valley LNR and the opportunity to provide habitats that extend and complement those within the LNR;
- to provide a buffer between the site and the protected great crested newt habitats along the eastern boundary and the opportunity to integrate enhanced breeding and terrestrial habitats for great crested newts, reptiles and other protected species into the landscape plans for the site. The existing area of protected great crested newt terrestrial and breeding habitat would be retained and suitable management implemented to maintain and enhance its ecological value for newts and other wildlife in accordance with the Natural England Development Licence conditions;
- to retain the mature trees on the western side of the site, including those with bat roost potential, and provide supplementary woodland/mixed native

scrub/native hedgerow and tree planting to create ecological corridors and extend current woodland and hedgerow habitats;

- to provide suitable ecological 'corridors' around the margins of the site and retain and enhance the ecological function of the site as part of local ecological network;
- to create areas of open habitats and features that are characteristic of the previous conditions on the site, including sparse wildflower grassland, scrapes, sandbanks, rubble piles and bare-ground ideal for notable invertebrates and birds. There would be the opportunity for such habitats to be analogous to 'Lowland Meadows' and 'Open Mosaic Habitats on Previously Developed Land', and London BAP Habitat 'Wasteland'; and
- adoption of a sensitive lighting scheme to prevent light-spill on to retained and adjacent habitats.

There is also the opportunity for the ecological design to integrate wildlife habitats into urban development, including wetland creation as part of sustainable urban drainage and bird and bat habitat integrated into new buildings.

In light of the above, it is considered that development of the site could meet the ecological objectives within the LEMP (refer to Section 2.2.2 above), and be undertaken in accordance with the following relevant biodiversity policies in the London Borough of Havering's Core Strategy and Development Control Policies Development Plan Document (adopted 2008) policies DC58 – Biodiversity and Geodiversity, and DC59 – Biodiversity in New Developments.

The development could also be undertaken in accordance with the biodiversity requirements of the National Planning Policy Framework.

3.2 *Ecological survey and assessment*

The ecological baseline for the site would be updated prior to submission of any future planning application. The survey results would be outlined in an Ecological Impact Assessment (EclA) Report, following CIEEM (2006) Guidelines. This would detail the full ecological baseline for the site and the impacts of the proposals (beneficial and adverse) during and post construction and provide an appropriate mitigation and enhancement strategy.

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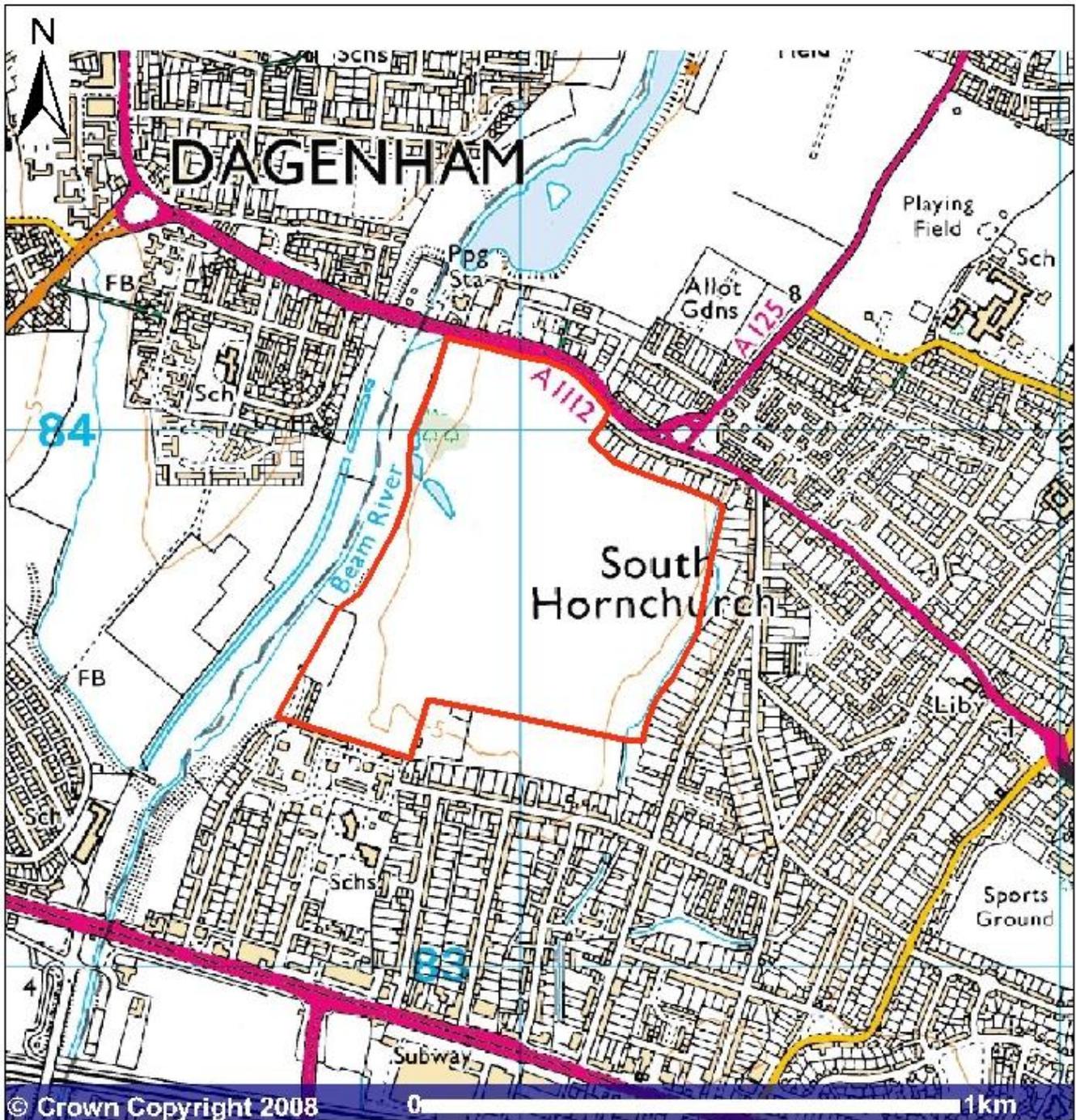
Websites

www.magic.gov.uk (*MAGIC*)

www.naturalengland.org (*Natural England*)

www.nbn.org.uk (*National Biodiversity Network*)

Figure 1: Site Location



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Key

 Site boundary



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Figure 1: Location Plan

Figure 2: Phase 1 habitat plan and Target notes

Target notes

- 1 Mature scrub dominated by hawthorn.
- 2 Species-poor semi-improved neutral grassland dominated by false-oat grass and cock's-foot.
- 3 Sand mound with bare ground associated with motorcycle use.
- 4 Mosaic of mature scrub and semi-improved neutral grassland along the site boundary.
- 5 Mature willow with bat roost potential.
- 6 Mature willow with bat roost potential with mature hawthorn scrub and dense stands of Japanese knotweed.
- 7 Mature willow with bat roost potential adjacent to an extensive stand of Japanese knotweed.
- 8 Mature willow with bat roost potential.
- 9 Mature willow with bat roost potential adjacent to a fallen dead tree.
- 10 Dense stands of common nettle.
- 11 Kestrel recorded foraging.
- 12 Sparsely vegetated ground that is likely to be seasonally wet.
- 13 Species-poor semi-improved grassland including abundant creeping thistle and dock.
- 14 Swamp dominated by reed canary grass.
- 15 Shallow ditch shaded by adjacent scrub with species including branched bur-reed, lesser bulrush and reed canary grass.
- 16 Swamp dominated by New Zealand pigmyweed.
- 17 Standing water with abundant New Zealand pigmyweed.

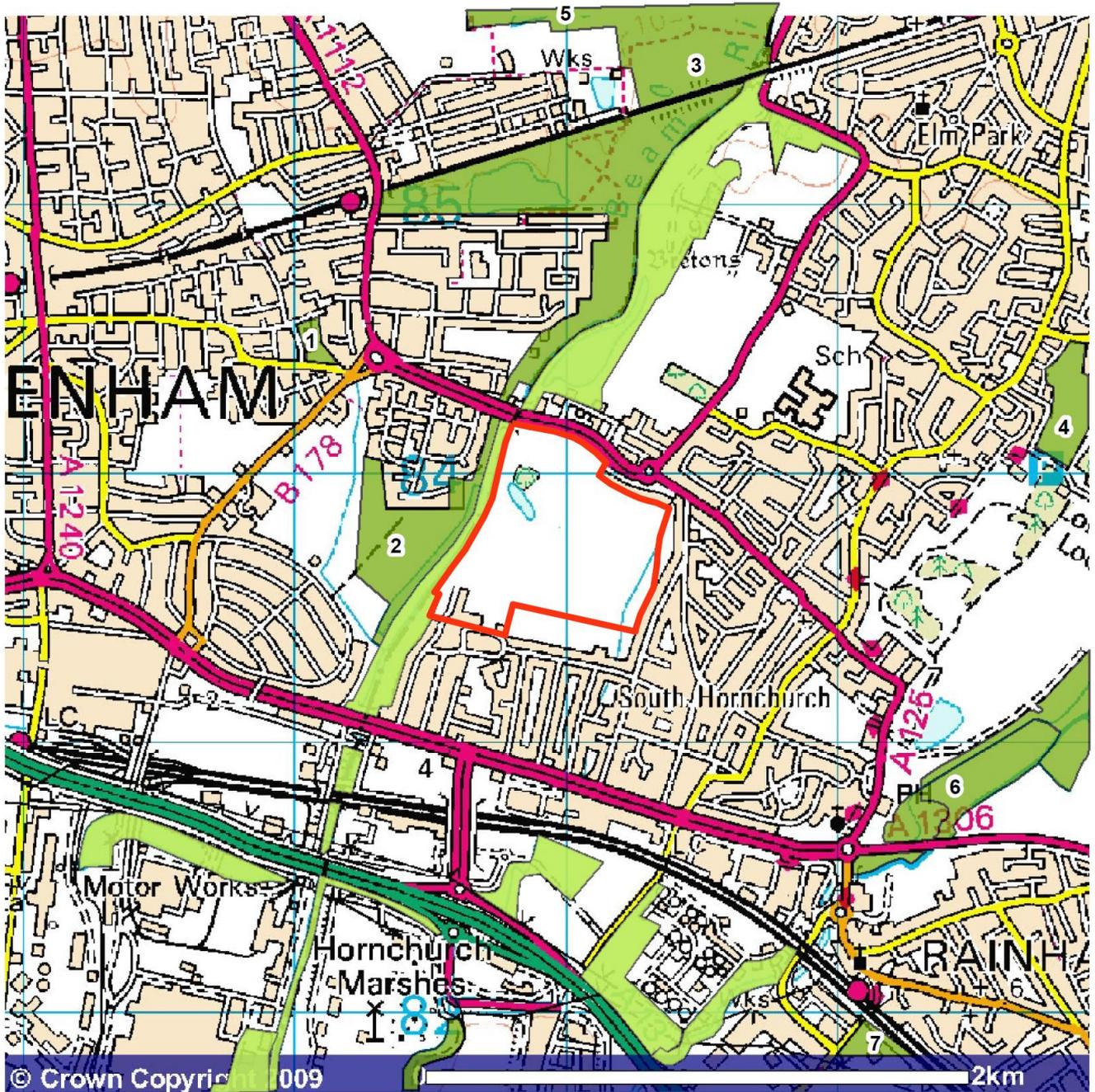


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Phase 1 Habitat Plan

Appendix 1: Designated sites of nature conservation value



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2km

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Key

 Site Boundary

 Sites of Importance for Nature Conservation

 Statutory Nature Conservation Sites

Statutory Sites

- 1 - Dagenham Village Churchyard (LNR)
- 2 - Beam Valley (LNR)
- 3 - The Chase (LNR)
- 4 - Ingrebourne Valley (LNR)
- 5 - East Brookend Country Park (LNR)
- 6 - Ingrebourne Marshes (SSSI)
- 7 - Inner Thames Marshes (SSSI)


ecological consultants

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Ecological Networks

Appendix 2: Species legislation and conservation status

Invertebrates

A number of UK invertebrates are protected by international and national legislation, including the EC Habitats Directive (1992) and the Wildlife and Countryside Act 1981 (as amended). In addition, numerous species are Priority Species.

Plants

All wild plants are protected against unauthorised removal or uprooting under Section 13 of the Wildlife and Countryside Act 1981 (as amended). Plants listed on Schedule 8 of the Act (e.g. stinking goosefoot, red helleborine, monkey orchid) are afforded additional protection against picking, uprooting, destruction and sale. Bluebell (*Hyacinthoides non-scripta*) is protected against sale only. Further species are also protected under the Conservation of Habitats and Species Regulations 2010 (as amended).

Notable plant species include those that are listed as:

- Nationally vulnerable – A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A-E for Vulnerable, and is therefore considered to be facing a high risk of extinction in the wild (Cheffings C M & Farrell L (Eds) (2005) *Species Status No. 7 – The Vascular Red Data List for Britain*, JNCC (online))
- Nationally scarce – species recorded in 16-100 hectads in Great Britain
- Nationally rare – species occurring in 15 or fewer hectads in Great Britain

Section 14 of the Wildlife and Countryside Act 1981 (as amended) prohibits the planting of certain invasive plant species in the wild, or otherwise causing them to grow there. Prohibited plants are listed on Part 2 of Schedule 9 and include Japanese knotweed, Himalayan balsam and giant hogweed.

Amphibians

There are seven native amphibian species present in Britain. These are afforded varying degrees of protection under national and European legislation. Great crested newts and their habitat are afforded full protection under UK and European legislation, including the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CROW) Act 2000 and the Conservation of Habitats and Species Regulations 2010 (as amended). Together, this legislation makes it illegal to:

- Deliberately capture, injure or kill a great crested newt.
- Damage or destroy any place used for shelter or protection, including resting or breeding places; or intentionally or recklessly obstruct access to such a place.
- Deliberately, intentionally or recklessly disturb great crested newts.

Great crested newt and common toad are Priority Species.

Reptiles

Slow-worm, viviparous/common lizard, adder and grass snake are protected under the Wildlife and Countryside Act 1981 (as amended) against intentional killing and injuring. These species are also Priority Species.

Birds

The bird breeding season generally lasts from March to early September for most species. All birds are protected under the Wildlife and Countryside Act (1981) (as amended) and the Countryside & Rights of Way (CRoW) Act 2000. This legislation makes it illegal, both intentionally and recklessly, to:

- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while it is being built or in use;
- take or destroy the eggs of any wild bird

Furthermore, birds listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) are protected against intentional or reckless disturbance whilst nest building and when at or near a nest containing eggs or young. Dependent young of Schedule 1 species are also protected against disturbance.

In addition to this legal protection, the leading governmental and non-governmental conservation organisations in the UK have reviewed the population status of the birds regularly found here and produced a list of birds of conservation concern. Of the 246 species assessed, 52 were placed on the Red List of high conservation concern, 126 on the Amber List of medium conservation concern and 68 on the Green List of low conservation concern:

- Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.
- Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; and those with internationally important or localised populations.

Badgers

Badger (*Meles meles*) is a widespread and common species. However, they are legally protected under The Protection of Badgers Act 1992, due to animal welfare concerns. Under this legislation it is illegal to:

- Wilfully kill, injure, take, or cruelly ill-treat a badger, or attempt to do so
- Intentionally or recklessly interfere with a sett by disturbing badgers whilst they are occupying a sett, damaging or destroying a sett, or obstructing access to it.

A badger sett is defined in the legislation as “*any structure or place, which displays signs indicating current use by a badger*”.

Bats

There are 18 species of bats found in the UK, 17 of which are known to breed here. The conservation status of these species is summarised in the table below:

Common name	Scientific name	IUCN Red List*	Priority Species
Greater horseshoe	<i>Rhinolophus ferrumequinum</i>	LC	Yes
Lesser horseshoe	<i>Rhinolophus hipposideros</i>	LC	Yes
Daubenton's	<i>Myotis daubentonii</i>	LC	No
Brandt's	<i>Myotis brandtii</i>	LC	No
Whiskered	<i>Myotis mystacinus</i>	LC	No
Natterer's	<i>Myotis nattereri</i>	LC	No
Bechstein's	<i>Myotis bechsteinii</i>	NT	Yes
Alcathoe bat	<i>Myotis alcathoe</i>	DD	No
Greater mouse-eared	<i>Myotis myotis</i>	LC	No
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	LC	No
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	LC	Yes
Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	LC	No
Serotine	<i>Eptesicus serotinus</i>	LC	No
Noctule	<i>Nyctalus noctula</i>	LC	Yes
Leisler's	<i>Nyctalus leisleri</i>	LC	No
Barbastelle	<i>Barbastellabarabastellus</i>	NT	Yes
Brown long-eared	<i>Plectorus auritus</i>	LC	Yes
Grey long-eared	<i>Plectorus austriacus</i>	LC	No

*IUCN categories: LC Least Concern, NT Near Threatened, DD Data Deficient

All bat species are afforded full protection under UK and European legislation, including the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended). Together, this legislation makes it illegal to:

- Deliberately capture, injure or kill a bat.
- Damage or destroy a bat roost; or intentionally or recklessly obstruct access to bat roosts.
- Deliberately, intentionally or recklessly disturb, a bat, including in particular any disturbance which is likely:
 - to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or
 - in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species to which they belong.

A bat roost is defined in the legislation as “any structure or place which a bat uses for shelter or protection”. Roosts are protected whether or not bats are present at the time.

Otter

Otters (*Lutra lutra*) are fully protected under UK and European legislation, including the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CRoW) Act 2000 and the Conservation of Habitats and Species Regulations 2010 (as amended). Together, this legislation makes it illegal to:

- Deliberately capture, injure or kill an otter
- Damage or destroy any structure or place used for shelter or protection by an otter; or intentionally or recklessly obstruct access to such a place.
- Deliberately, intentionally or recklessly disturb an otter whilst it is occupying a structure or place which it uses for shelter or protection

Otter is listed as a Priority Species.

Water vole

Water vole are afforded full protection under the Wildlife and Countryside Act 1981 (as amended), which make it illegal to:

- Kill, injure or take a water vole.
- intentionally or recklessly destroy, damage or obstruct access to any structure or place that is used by a water vole for shelter or protection.
- intentionally or recklessly disturb a water vole whilst it is in a place used for shelter or protection.

Water vole is also a Priority Species.

Common/Hazel dormouse

The common dormouse is fully protected under UK and European legislation, including the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CRoW) Act 2000 and the Conservation of Habitats and Species Regulations 2010 (as amended). Together, this legislation makes it illegal to:

- Deliberately capture, injure or kill a dormouse.
- Damage or destroy any structure or place used for shelter or protection by a dormouse; or intentionally or recklessly obstruct access to such a place.
- Deliberately, intentionally or recklessly disturb a dormouse whilst it is occupying a structure or place which it uses for shelter or protection

The dormouse is a Priority Species.

Appendix 3: Species list

Species List

Scientific Name	Common Name
Trees and shrubs	
<i>Acer pseudoplatanus</i>	Sycamore
<i>Betula pendula</i>	Silver birch
<i>Buddleja davidii</i>	Buddleia
<i>Colutea arborescens</i>	Bladder-senna
<i>Cornus sanguinea</i>	Dogwood
<i>Crataegus monogyna</i>	Hawthorn
<i>Cytisus scoparius</i>	Broom
<i>Fraxinus excelsior</i>	Ash
<i>Laburnum anagyroides</i>	Laburnum
<i>Lavatera arborea</i>	Tree mallow
<i>Malus pumila</i>	Cultivated apple
<i>Populus tremula</i>	Aspen
<i>Prunus avium</i>	Wild cherry
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus robur</i>	Pedunculate oak
<i>Rosa canina</i>	Dog-rose
<i>Rubus fruticosus agg.</i>	Bramble/ Blackberry
<i>Salix alba</i>	White willow
<i>Salix caprea</i>	Goat willow
<i>Salix cinerea</i>	Grey willow
<i>Salix fragilis</i>	Crack willow
<i>Sambucus nigra</i>	Elder
<i>Salix viminalis</i>	Osier
Grasses, sedges and rushes	
<i>Agrostis capillaris</i>	Common bent
<i>Agrostis stolonifera</i>	Creeping bent
<i>Alopecurus geniculatus</i>	Marsh foxtail
<i>Anisantha sterilis</i>	Barren brome
<i>Arrhenatherum elatius</i>	False-oat grass
<i>Brachypodium sylvaticum</i>	False brome
<i>Bromus lepidus</i>	Slender soft-brome
<i>Carex pendula</i>	Pendulous sedge
<i>Carex spicata</i>	Spiked sedge
<i>Catapodium rigidum</i>	Fern-grass
<i>Cynosurus cristatus</i>	Crested dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Elytrigia repens</i>	Common couch
<i>Festuca arundinacea</i>	Tall fescue

Scientific Name	Common Name
<i>Festuca ovina</i>	Sheep's fescue
<i>Festuca rubra</i>	Red fescue
<i>Glyceria fluitans</i>	Floating sweet-grass
<i>Glyceria maxima</i>	Reed sweet-grass
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hordeum murinum</i>	Wall barley
<i>Hordeum secalinum</i>	Meadow barley
<i>Juncus articulatus</i>	Jointed rush
<i>Juncus inflexus</i>	Hard rush
<i>Lolium perenne</i>	Perennial rye-grass
<i>Phalaris arundinacea</i>	Reed canary-grass
<i>Phleum bertoloni</i>	Small-leaved timothy grass
<i>Phleum pratense</i>	Timothy
<i>Phragmites australis</i>	Common reed
<i>Poa pratensis</i>	Smooth meadow-grass
<i>Vulpia myuros</i>	Rat's-tail fescue
Broadleaved Herbs	
<i>Achillea millefolium</i>	Yarrow
<i>Arctium. minus</i>	Lesser burdock
<i>A Armoracia rusticana</i>	Horse radish
<i>Artemisia campestris</i>	Field wormwood
<i>Artemisia vulgaris</i>	Mugwort
<i>Ballota nigra</i>	Black horehound
<i>Blackstonia perfoliata</i>	Yellow-wort
<i>Bryonia dioica</i>	White bryony
<i>Calystegia sepium</i>	Hedge bindweed
<i>Centaurea nigra</i>	Black knapweed
<i>Chamerion angustifolium</i>	Rosebay willowherb
<i>Cichorium intybus</i>	Chicory
<i>Cirsium arvense</i>	Creeping thistle
<i>Cirsium vulgare</i>	Spear thistle
<i>Clematis vitalba</i>	Traveller's-joy
<i>Conium maculatum</i>	Hemlock
<i>Convolvulus arvensis</i>	Field bindweed
<i>Crassula helmsii</i>	New Zealand pigmyweed
<i>Crepis capillaris</i>	Smooth hawk's-beard
<i>Daucus carota</i>	Wild carrot
<i>Dipsacus fullonum</i>	Teasel
<i>Echium vulgare</i>	Viper's bugloss
<i>Epilobium hirsutum</i>	Great willowherb
<i>Equisetum hyemale</i>	Rough horsetail

Scientific Name	Common Name
<i>Fallopia japonica</i>	Japanese knotweed
<i>Foeniculum vulgare</i>	Fennel
<i>Geranium dissectum</i>	Cut-leaved crane's-bill
<i>Geranium molle</i>	Dove's foot crane's-bill
<i>Geum urbanum</i>	Herb bennet
<i>Glechoma hederacea</i>	Ground ivy
<i>Heracleum mantegazzianum</i>	Giant hogweed
<i>Heracleum sphondylium</i>	Hogweed
<i>Hieracium</i> sp	Hawkweed species
<i>Hypericum perforatum</i>	Perforate St John's-wort
<i>Hypochaeris radicata</i>	Cat's ear
<i>Iris pseudacorus</i>	Yellow iris
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lathyrus latifolius</i>	Broad-leaved everlasting-pea
<i>Lathyrus pratensis</i>	Meadow vetchling
<i>Lepidium draba</i>	Hoary cress
<i>Linaria purpurea</i>	Purple toadflax
<i>Linaria vulgaris</i>	Common toadflax
<i>Lotus corniculatus</i>	Common bird's foot trefoil
<i>Lotus pedunculatus</i>	Greater bird's foot trefoil
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Malva sylvestris</i>	Common mallow
<i>Medicago lupulina</i>	Black medick
<i>Medicago sativa</i>	Lucerne
<i>Melilotus albus</i>	White melilot
<i>Melilotus officinalis</i>	Ribbed melilot
<i>Odontites vernus</i>	Red bartsia
<i>Oenothera glazioviana</i>	Large-flowered evening-primrose
<i>Papaver rhoeas</i>	Common poppy
<i>Persicaria lapathifolia</i>	Pale persicaria
<i>Picris echioides</i>	Bristly oxtongue
<i>Plantago coronopus</i>	Buck's-horn plantain
<i>Plantago lanceolata</i>	Ribwort plantain
<i>Potentilla reptans</i>	Creeping cinquefoil
<i>Ranunculus repens</i>	Creeping buttercup
<i>Raphanus raphanistrum</i>	Wild radish
<i>Reseda lutea</i>	Wild mignonette
<i>Reseda luteola</i>	Weld
<i>Rumex conglomeratus</i>	Clustered dock
<i>Rumex obtusifolius</i>	Broad-leaved dock
<i>Saponaria officinalis</i>	Soapwort

Scientific Name	Common Name
<i>Senecio jacobaea</i>	Common ragwort
<i>Sonchus asper</i>	Prickly sow-thistle
<i>Sparganium erectum</i>	Branched bur-reed
<i>Tanacetum vulgare</i>	Tansy
<i>Tragopogon pratensis</i>	Jack-before-noon
<i>Trifolium arvense</i>	Hare's-foot clover
<i>Trifolium pratense</i>	Red clover
<i>Trifolium repens</i>	White clover
<i>Tripleurospermum inodorum</i>	Scentless mayweed
<i>Tussilago farfara</i>	Colt's-foot
<i>Typha latifolia</i>	Bulrush
<i>Urtica dioica</i>	Common nettle
<i>Verbena officinalis</i>	Vervain
<i>Vicia cracca</i>	Tufted vetch
<i>Vicia tetrasperma</i>	Smooth tare
Birds	
<i>Alauda arvensis</i>	Skylark
<i>Apus apus</i>	Swift
<i>Ardea cinerea</i>	Grey heron
<i>Carduelis cannabina</i>	Linnet
<i>Carduelis carduelis</i>	Goldfinch
<i>Corvus corone</i>	Carrion crow
<i>Falco tinnunculus</i>	Kestrel
<i>Passer domesticus</i>	House sparrow
<i>Perdix perdix</i>	Grey partridge
<i>Phylloscopus collybita</i>	Chiffchaff
<i>Pica pica</i>	Magpie
<i>Picus viridis</i>	Green woodpecker
<i>Prunella modularis</i>	Dunnock
<i>Streptopelia decaocto</i>	Collared dove
<i>Sylvia atricapilla</i>	Blackcap
<i>Sylvia communis</i>	Whitethroat
<i>Troglodytes troglodytes</i>	Wren
<i>Turdus merula</i>	Blackbird
Butterflies	
<i>Coenonympha pamphilus</i>	Small heath
<i>Inachis io</i>	Peacock
<i>Maniola jurtina</i>	Meadow brown
<i>Pararge aegeria</i>	Speckled wood
<i>Polygonia c-album</i>	Comma
<i>Pyronia tithonus</i>	Gatekeeper

Scientific Name	Common Name
<i>Thymelicus lineola</i>	Essex skipper

Appendix 4: Pre-restoration site photographs (2008)



Photograph 1: Tall ruderal



Photograph 2: Tall ruderal and bare ground



Photograph 3: Semi-improved neutral grassland in the north part of the site.



Photograph 4: Adjacent habitats in Beam Valley LNR.



Photograph 5: Ephemeral/short perennial.



Photograph 6: Ephemeral/short perennial.



Photograph 7: Standing water on the eastern boundary of the site.



Photograph 8: Bare ground and tall ruderal in the central part of the site.



Photograph 9: Introduced shrub.



Photograph 10. Mature willow with bat roost potential.



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Report

**Appendix F
Green Belt
Assessment /
Methodology
Framework**

1. Green Belt Assessment Methodology

- 1.1 The purpose of this appendix is to set out the methodology applied in assessing Mardyke Farm’s contribution towards the purposes of including land within the Green Belt.
- 1.2 Following a review of best practice in the assessment of Green Belt used within the industry, the criteria used to assess the Green Belt at Mardyke Farm were thoroughly justified and written in accordance with national policy. Studies demonstrate that the criteria to be used to undertake the Green Belt assessment needs to:
- Clearly define national policy terminology to inform the assessment criteria;
 - Identify the objectives of each purposes against which the site is to be assessed, based on the definitions as set out above; and
 - Take the form of a set of clear but specific questions to be answered for each purpose.
- 1.3 Accordingly, Table 1 below provides a consistent framework for assessment. Any interpretations made utilise the definitions stated.

Table 1: Green Belt Assessment Methodology

Purpose	Step 1: Definition of Terminology	Step 2: Define Green Belt Objectives	Step 3: Specific questions to determine whether site contributes towards Green Belt Purposes
To check the unrestricted sprawl of large built-up areas	<p>Sprawl – ‘spread out over a large area in an untidy or irregular way’ (Oxford Dictionary).</p> <p>Large Built-up areas – in the context of the study, this focuses on Greater London, where outward expansion was controlled as an original purpose of the Green Belt.</p>	<p>The first purpose performs a barrier role.</p> <p>This purpose is assessed at the strategic level whereby it underpins the establishment of the Green Belt in the sense that the original strategic purpose was to check sprawl from London.</p>	<ol style="list-style-type: none"> 1) Does the parcel act, in itself, as an effective barrier against sprawl from large built-up areas outside of the study area? 2) Does the parcel contribute, as part of a wider network of parcels, to a strategic barrier against sprawl of these built-up areas?
To prevent neighbouring towns from merging	<p>Neighbouring towns – LBH comprises a web of interconnected neighbourhoods without distinctive boundaries. The adopted Core Strategy does not identify a clear ‘settlement hierarchy’ within the borough and accordingly, the differentiation between the main built-up areas of neighbouring boroughs, rather than local neighbourhoods within LBH is considered to be the key consideration at the local level.</p>	<p>The second purpose performs an interstitial role, whereby gaps or spaces between settlements exist and have a clear role in preventing coalescence.</p> <p>This purpose is considered to play a significant role in maintaining the existing settlement pattern of towns.</p>	<ol style="list-style-type: none"> 3) Does the parcel provide, or form part of, a gap or space between existing 1st tier settlements (neighbouring towns/boroughs)? 4) What is the distance of the gap between the settlements? 5) Is there evidence of ribbon development on major route corridors?

Purpose	Step 1: Definition of Terminology	Step 2: Define Green Belt Objectives	Step 3: Specific questions to determine whether site contributes towards Green Belt Purposes
	<p>Merging – this can be by way of general sprawl (above) or;</p> <p>Ribbon Development – The building of houses along a main road, especially one leading out of a town or village (Oxford Dictionary). This includes historical patterns or, or current pressures for, the spread of all forms of development along movement corridors, particularly major roads.</p>		<p>6) What is the visual perception of the gap between settlements from major route corridors?</p> <p>7) Would a reduction in the gap compromise the separation of settlements in physical terms?</p> <p>8) Would a reduction in the gap compromise the separation of settlements and the overall openness of the site visually?</p>
To assist in safeguarding the countryside from encroachment	<p>Encroachment – a gradual advance beyond usual or acceptable limits (Oxford Dictionary)</p> <p>The countryside – open land with an absence of built development and urbanising influences, and characterised by rural land uses including agriculture and forestry. Relevant landscape character or quality designations will be taken into account in assessing the role of the</p>	<p>The third purpose performs a protective role, to safeguard the countryside as defined above.</p> <p>Landscape characteristics also influence the perception of character and quality of countryside. The assessment therefore considers topography, woodland and tree cover and presence of hedgerows / boundary planting which can define views and perceptions of openness in</p>	<p>9) What countryside / rural characteristics exist within the site including agricultural or forestry land uses and how is this recognised in established national and local landscape designations?</p> <p>10) Has there already been any significant encroachment by built development or other</p>

Purpose	Step 1: Definition of Terminology	Step 2: Define Green Belt Objectives	Step 3: Specific questions to determine whether site contributes towards Green Belt Purposes
	Green Belt in safeguarding countryside in accordance with a 'functional' view of the countryside.	the landscape. Countryside, urban fringe and urbanising characteristics and influences have been taken into account as part of the assessment.	urbanising elements?
To preserve the setting and special character of historic towns	Historic town – settlement or place with historic features identified in local policy or through conservation area or other historic designation(s).	<p>The fourth purpose performs a girdle role, as a green ring around historic settlements or to provide the landscape context to historic features that preserves setting by keeping land open.</p> <p>The purpose goes beyond a simple definition of historic towns and relates to the identification of all the key historic places across the study area in both urban and rural settings. Existing designations of historic value and interest such as conservation areas, historic parks and gardens and scheduled monuments have been used to identify historic 'places' relevant to this assessment. Both the physical and visual relationship with the Green Belt has been assessed.</p>	<p>11) What settlements or places with historic features exist within the site?</p> <p>12) What is the relationship and connection (in the form of character, views and visual perception) between the site and historic features?</p> <p>13) Does the site provide an open setting or a buffer against encroachment by development around settlements or places with historic features?</p>

Purpose	Step 1: Definition of Terminology	Step 2: Define Green Belt Objectives	Step 3: Specific questions to determine whether site contributes towards Green Belt Purposes
<p>To assist in urban regeneration, by encouraging the recycling of derelict and other urban land</p>	<p>Urban Regeneration – the aim of which the Core Strategy identifies as to revitalise areas of deprivation and preserve or enhance an areas heritage value through significant improvements to access to public services (including transport) and sensitive mixed use development to create balanced communities.</p> <p>Recycling – to use again (Oxford Dictionary)</p> <p>Derelict and other urban land – land in a very poor condition (Oxford Dictionary) which the Core Strategy identifies as falling within the category of Brownfield land or previously developed land. The NPPF encourages the effective reuse of such land, where it is not of a high environmental value.</p>	<p>The fifth purpose performs a local role to assist in the regeneration of specific local areas.</p> <p>Assisting urban regeneration, by encouraging the recycling of derelict and other urban land is perhaps the most complex purpose to assess because the relationship between the Green Belt and recycling of land is influenced by a range of external factors including local plan policies, brownfield land availability and the land and development market. Nonetheless a qualitative assessment of the sites contribution to local regeneration initiatives has been undertaken.</p>	<p>14) Is there a deliverable supply of derelict and other urban land available?</p> <p>15) Does this parcel act, in itself, as a barrier to bringing other derelict and other urban land forward?</p>

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- 1.4 The above definitions of the primary objectives of the five purposes of the Green Belt is consistent with best practice cases within the industry and is therefore considered to represent a robust starting point from which to undertake an assessment of the site against Green Belt objectives.
- 1.5 In line with best practice, the assessment provides a qualitative assessment of Mardyke Farm against the purposes of including land within the Green Belt as defined within the NPPF based on the following classifications.

Green	Significant contribution to Green Belt Purposes
Orange	Partial contribution to Green Belt purposes
Red	Limited or no contribution to Green Belt purposes

- 1.6 The classification denotes the outcome of the assessment of the contribution the site makes to each of the Green Belt purposes.
- 1.7 For each purpose, the supporting text explains how the classification has been arrived at. The presentation of the classification for each purpose assists in understanding and assessing the value of the various roles performed by the site. This approach to individually assessing the national purposes allows for a clear and transparent evaluation that sets out the information needed to judge the overall contribution of Mardyke Farm to the purposes of the Green Belt.

Hornchurch
Masterplan Studies

Formation Architects

23 March 2015

Introduction

This document has been prepared by Formation Architects and Montagu Evans LLP to investigate development opportunities for the site currently occupied by the Cardrome Garage and Learner Centre and the Rom Skatepark, Upper Rainham Road, Hornchurch RM12 4EU.

The site extends over 4.8 hectares and is bordered by Upper Rainham Road to the east, a private residential development to the north and the public open space surrounding the River Beam and known as 'The Chase' to the south and west.

The site is currently designated as a Major Developed Site within the Green Belt.

The main and vehicular access is located along the eastern boundary, adjacent to an existing petrol station which does not form part of the site.

The area immediately to the north and west of the petrol station is occupied by a garage and a number of offices and structures including a tyre replacement centre, MOT centre, car wash and various vehicle repair units. In addition there are 5no. separate used car sites and related businesses occupying semi-mobile structures with established use status.

To the south of the petrol station is the skatepark, which occupies most of the south-east corner of the site and comprises of the main skating area and a number of associated ancillary buildings.

The skatepark has recently been listed by English Heritage for its cultural significance and will therefore be retained.

This document presents our initial masterplan studies for the redevelopment of the site for residential use. It is intended to provide an indication of the level of development that could be provided across the site and the associated planning benefits.



Site plan



Site pictures



View of the northern boundary of the site, showing the steep drop in level from the neighbouring properties



View from the centre of the site looking north. In the background are the 3-storey houses on Bancroft Chase.



View from the centre of the site looking towards south-east. The three telecommunication masts are visible in the background.



View from the southern end of the site looking north. Rom Skate Park on the right.



View of the Rom Skatepark



View of the Rom Skatepark



View of petrol station



View of substation by the south-east corner of the site



View along Bancroft Chase



View along The Chase, looking west.



View along Upper Rainham Road, looking north.



View along Acacia Avenue, looking north.

Planning Policy

Introduction

The purpose of this section is to provide an overview of relevant planning policy that has informed the masterplan work.

We consider that the proposed scheme demonstrates a sympathetic approach in redeveloping the site for residential purposes. The high quality design of the scheme seeks to best utilise the site area whilst considering the complex planning challenges involved in responding to the setting of the heritage assets and the Major Development Site within the Green Belt designation.

The Site

The Site falls within the jurisdiction of the London Borough of Havering (LBH) and is located within Upper Rainham, Hornchurch. The site extends to approximately 4.85 hectares (11.98 acres).

The site is located on the western side of the A125 (Upper Rainham Road), which provides connections to Romford, approximately two kilometres to the north, and Dagenham via the A1112, approximately 3.5 kilometres to the south.

Elm Park station lies 1.5 kilometres to the south east of the site and provides connections to the wider Underground network via the Piccadilly line. Romford Railway Station provides direct links into London Liverpool Street and is about 2.5 kilometres to the north.

Harrow Lodge Park is located approximately 300m to the south east of the site. The park provides large outdoor amenity space, child play and areas of hard standing dedicated to recreational sports such as tennis and a boating lake.

A skatepark is located in the south eastern corner of the site. The skate park, which was constructed in 1978, has recently (July 2014) been listed as a Grade II listed structure.

Planning History

An online planning history search uncovered numerous applications at the site dating between 1987 and 2008. The majority of the applications related to the erection of telephone masts. The most recent application was for advertisement consent, the application was refused in 2008.

Existing Use

The majority of the broadly rectangular site is used as an off road learner driving centre. Multiple small scale commercial units are located in middle section of the site, along the eastern boundary, adjoining the petrol station which fronts onto Upper Rainham Road. The petrol station does not fall within the red line boundary of the site.

In light of the planning history set out above, we consider that the lawful use of the majority of the site as existing is Sui Generis, the skatepark is D2 (assembly and leisure), and the collection of commercial premises is B2 (Light Industrial).

Planning Policy Context

The statutory development plan for the site currently comprises:

- LBH Core Strategy and Development Control Policies Document (DPD) (2008);
- LBH Site Allocations DPD (2008);
- Saved policies from the Romford Area Action Plan (2008); and
- The London Plan (Consolidated with Alterations since 2011).

There are a number of planning guidance documents that are of particular relevance to the proposals:

- Planning Obligations (2013);
- Heritage (2011);
- Residential Design (2010); and
- Sustainable Design and Construction (2009).

Site Specific Designations

The Site is designated as a Major Developed Site within the Metropolitan Green Belt.

A strip of land bordering the western boundary of the site is designated as a Metropolitan Site of Nature Conservation Importance.

The site falls within Flood Zone 1, the lowest designation and is therefore considered unlikely to flood.

As noted above, the skatepark on site is Grade II listed.

National Planning Policy Framework (NPPF) (March 2012)

The National Planning Policy Framework (the “NPPF”) was published on 27 March 2012 and supersedes previous national planning guidance contained in various Planning Policy Guidance and Planning Policy Statements. The NPPF sets out the Government’s approach to planning matters, and is a material consideration in the determination of planning applications.

The NPPF states that “the purpose of the planning system is to contribute to the achievement of sustainable development” (NPPF, paragraph 6) and that it “should play an active role in guiding development to sustainable locations” (paragraph 8). It further states that this presumption in favour of sustainable development, should be seen as a golden thread running through decision-taking (paragraph 14).

In March 2014 the Government published the National Planning Practice Guidance (NPPG) which is a material consideration in relation to planning applications. The NPPG replaces a number of previous circulars and guidance to provide a simplified single source of guidance at the national level.

The NPPF outlines 12 core planning principles which state that planning should proactively drive and support sustainable economic development to deliver new homes; seek to secure high quality design; support the transition to a low carbon future; encourage the use of previously developed land; promote mixed-use developments; and focus significant development in sustainable locations.

The NPPF also sets out a number of policies. Of particular relevance to the Client’s proposal are the following:

- Chapter 6 of the NPPF makes it clear that local authorities need to boost significantly the supply of housing to deliver a wide choice of high quality homes, and to widen opportunities for home ownership and create sustainable, inclusive and mixed communities.
- In planning decision making, housing applications should be considered in the context of the presumption in favour of sustainable development. Relevant policies for the supply of housing should not be considered up-to-date if the local planning authority cannot demonstrate a five-year supply of deliverable housing sites (Paragraph 49).
- Chapter 7 attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible

from good planning, and should contribute positively to making places better for people (Paragraph 56). In determining applications, great weight should be given to outstanding or innovative designs which help raise the standard of design more generally in the area (Paragraph 63).

- Chapter 9 of the NPPF sets out the protection afforded to Green Belts (Paragraph 79). The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence.
- When considering any planning application, local planning authorities should ensure that substantial weight is given to any harm to the Green Belt. ‘Very special circumstances’ will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations (para 89).
- Paragraph 89 states that a local planning authority should regard the construction of new buildings as inappropriate in Green Belt. Exceptions to this include the partial or complete redevelopment of previously developed sites (brownfield land), whether redundant or in continuing use (excluding temporary buildings), which would not have a greater impact on the openness of the Green Belt and the purpose of including land within it than the existing development.
- Chapter 12 of the NPPF sets out the national policy context in relation to the conservation of the historic environment. It states that local planning authorities should set out in their Local Plan a positive strategy for the conservation and enjoyment of the historic environment (para 126). In determining planning applications, local planning authorities should take account of:
 - the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;
 - the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and
 - the desirability of new development making a positive contribution to local character and distinctiveness.

London Plan (Consolidated with alterations since 2011)

The London Plan is the overall strategic plan for London setting out an integrated economic, environmental, transport, and social framework for London over the next 20-25 years. It provides the context to which individual boroughs must set their planning policies. Policies of particular relevance are outlined below.

- Policy 3.3 'Increasing Housing Supply' of the London Plan recognises that there is a pressing need for more homes in London and states that Boroughs should seek to achieve and exceed annual average housing targets. This Policy seeks to deliver an annual average of 423,887 net additional homes across London over the plan period, with an annual monitoring target of 1,170 new homes in LBH.
- development proposals to optimise potential for housing, taking into account local context and character.
- Policy 3.5 (a) 'Quality and design of housing developments' adds that "Housing developments should be of the highest quality internally, externally and in relation to their context and to the wider environment, to protect and enhance London's residential environment and attractiveness as a place to live."

London Borough of Havering Local Plan: Core Strategy and Development Control Policies (2013)

- LBH Core Strategy Policy CP1 (Housing Supply) – states that LBH will provide a minimum of 535 new homes across the Borough each year between 2007/08 – 2016/17. However the revised London Plan has increased the housing target to 11,701 new dwellings for the next 10 years (2015 – 2025) equating to 1,170 per annum.
- LBH supports the principle of residential development within the Borough as does the NPPF which has the required to significantly boost the supply of housing at its core.
- In line with Policy DC2 (Housing mix and Density) a mix of housing types and sizes will be required in all developments and should contain primarily contain 1, 2 and 3 bedroom units. It should be noted that the exact mix on each site will vary according to the location of the development, the character of the surrounding area, and the objectively assessed need at the time of application.

- Policy DC6 'Affordable Housing' states that on developments of 10 or more homes or residential sites of 0.5 hectares LBH will seek to achieve 50% of all new homes to be affordable. The borough wide affordable tenure split of 70:30 social / intermediate is also sought. These targets are of course subject to site specific circumstances and financial viability.
- DC45 (Appropriate Development in the Green Belt) states that planning permission for new buildings will only be granted for certain purposes, one of which is it if involves the limited infilling or redevelopment on a site designated as a Major Developed Site in accordance with DC46.

Emerging Policy

LBH has commenced its review of its adopted planning policy. The Council is currently conducting an initial round of consultation on a new Local Plan. This stage seeks to determine the views on the key strategic priorities for the Borough over the next 15 years and how these priorities should be addressed. This has afforded the opportunity to promote the site as a suitable location for housing in order to meet an increase in housing need across the Borough.

Current aspirations are for the site to be released from the Green Belt in order to maximise the opportunities affected by the site in terms of securing the long term future of the recently listed skatepark and the contribution it can make to meeting the current strategic housing needs.

In addition to these two main benefits, the site also affords opportunities to:

- deliver a sustainable form of development in accordance with paragraph 14 of the NPPF
- biodiversity and ecological improvements
- enhances public access to the site and the Green Belt beyond
- enhanced tree belt to improve views from the Green Belt
- remediation across the site

This would create a policy basis against which an application could be brought forward without the need to demonstrate a case of 'very special circumstances'. The site affords opportunity to address a number of policy objectives. However as identified the main two are as follows:

The Principle of Residential Development on the Site

There is a significant need for housing across London including within LBH. This need is amplified given following the adoption of the further alterations to the London Plan in March 2015. This has resulted in an increase in the annual housing requirements for the Borough. A boost in the supply of housing is a theme also evidenced throughout the NPPF.

The recently adopted Further Alterations to the London Plan sets a target to deliver 11,701 new homes in LBH between 2015-2025 (equating to an annual requirement of 1,170 dwellings per annum). In light of this, LBH will need to identify additional land to accommodate the increase in targets.

The delivery of a significant number of units on this previously developed site should be given significant weight by the Council and the GLA. In addition, the site's location within a suburban area lends itself to proposing a residential led scheme of the scale, density and design proposed.

Within this provision there will also be significant affordable housing provision.

Heritage Considerations

There is a Grade II Listed asset on site – a skatepark.

The NPPF requires LPAs to plan positively for the conservation and enjoyment of the historic environment, conserving heritage assets in a manner appropriate to their significance. In doing so, the contribution to wider social, cultural and environmental benefits as well as local character and distinctiveness should be considered.

In addition, securing a viable use of listed buildings should be sought to continue the long term preservation.

The London Plan and local policy reflects the NPPF, seeking to protect and enhance historic assets and their settings and conserving their significance by being sympathetic to their form, scale, materials and architectural detail.

The proposals demonstrate an intention to incorporate the skatepark into the site. The proposals also envisage a method of subsidising the running of the skatepark. In doing so, the development will comply with policy at national, regional and local levels by ensuring the long term provision of the asset to the significant benefit of the local community.

Constraints and Opportunities

A number of constraints have been identified for the site:

- Potential noise disturbance from Upper Rainham Road and the existing garage (only along the edge).
- Potential overlooking from the neighbouring properties to the north.
- Relationship with the small grain of surrounding buildings.
- Potential visual impact on open space to west and south, although the impact would be very limited due to vegetation and level changes.
- Telecommunication masts (can be relocated).

At same time, the site also offers a number of opportunities:

- Poor quality of the existing buildings on site.
- Proximity to established residential area.
- Excellent access to daylight and sunlight.
- Good access to local buses, site is under 1 mile to Elm Park underground station and 1.6 miles to Romford overground train station.
- The site is largely clear of buildings and mostly flat.
- The proximity to the open land to the west can provide visual amenity.
- The changes in level along the northern edge could be exploited to achieve taller buildings.
- The Rom Skatepark can become a unique feature of the redevelopment and a community asset.
- Site can provide much needed housing in the local area.



Masterplan Approach

The size of the site gives the opportunity to create a focal point, in the form of a public central space. This would provide amenity and help create a sense of place. The natural position for the central square would be in the widest portion of the site, ideally close to the main access so that it can also serve as an arrival point.

Upper Rainham Road is quite trafficked and as such a buffer might be required to protect the houses. The idea is to place larger blocks of flats with quality sound insulation along the street so that the homes at the rear can enjoy more privacy and are shielded from vehicular noise.

The north-east corner of the site relates quite closely to the neighbouring buildings and as such it offers the opportunity to create a more urban edge to the development, with a strong corner. Once again, a block of flats in this position would serve the purpose better than a row of houses.

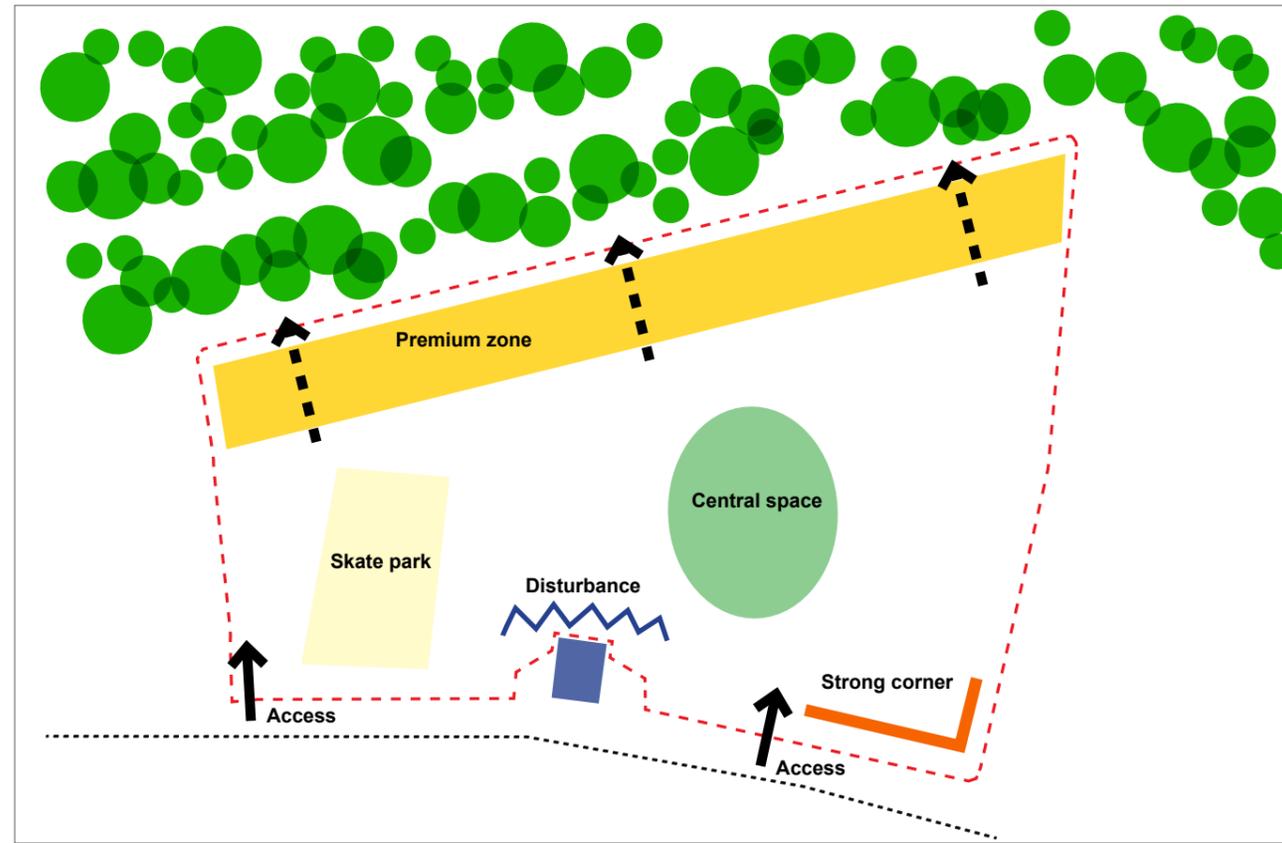
The proximity of the site to the large open space along the Rom River suggests that the western portion of the plot should be the most 'prime' area. It is in this location that the larger units will be placed, with direct visual access to the public open space and as far as possible from the road.

The Rom Skatepark is a key feature of the site and as such it should be well integrated within the masterplan. The nature of the operation makes it difficult to entirely open up the skate park to the rest of the site, nonetheless it could be part of the proposed network of footpaths and open spaces.

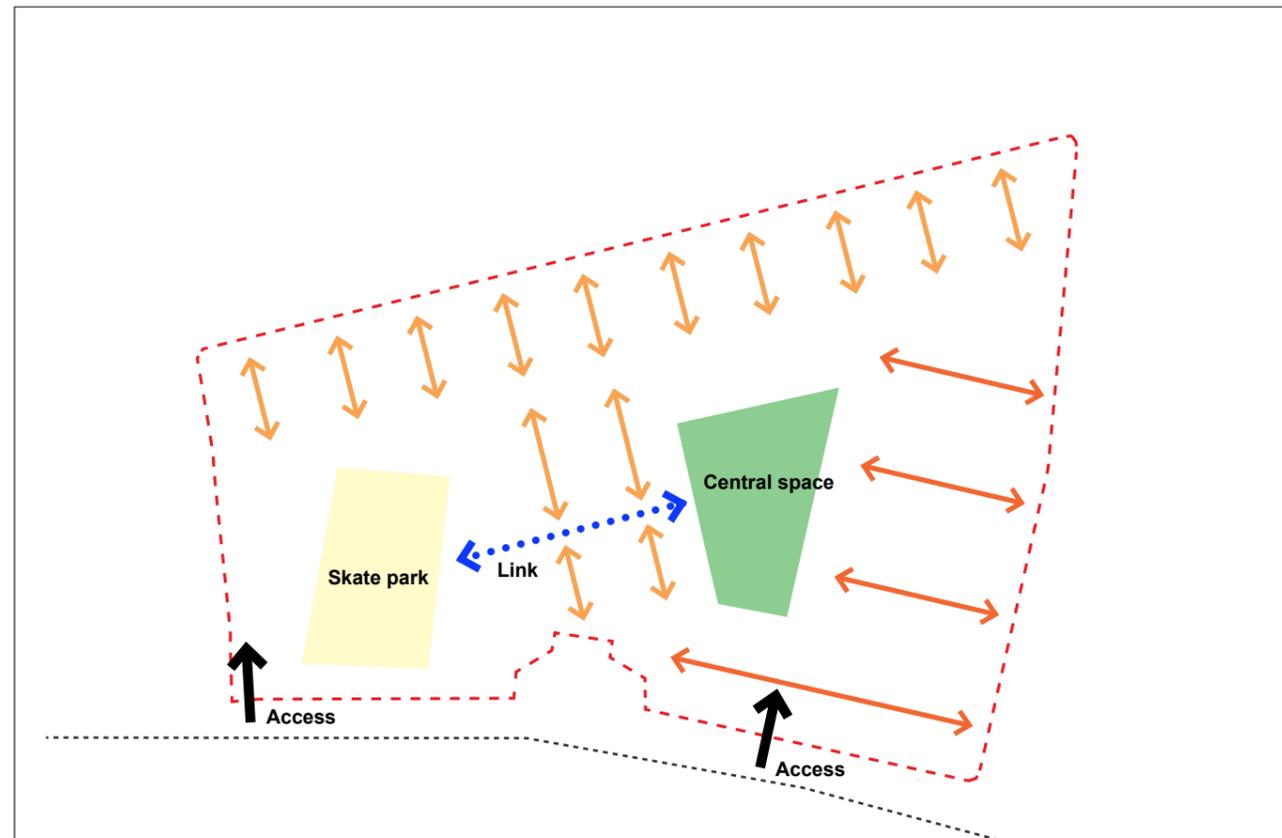
The diagram at the bottom of this page shows how the irregular shape of the site is dealt with by adopting two different alignments which converge in the central open space.

By doing so all buildings can retain a regular shape whilst still relating to the site boundaries.

All the studies contained in the following pages are based on the principles above and investigate alternative layouts with varying residential densities.



Masterplan approach



Masterplan approach

Previous studies

The principles described in the previous page have been applied to a number of studies aimed at establishing the appropriate density for the masterplan.

In Study 1 the different geometries converging into the central square correspond to two separate building typologies: the block aligned to the road are apartments and the rest are terraced houses.

This option generates the highest number of units with a large proportion made up of flats.

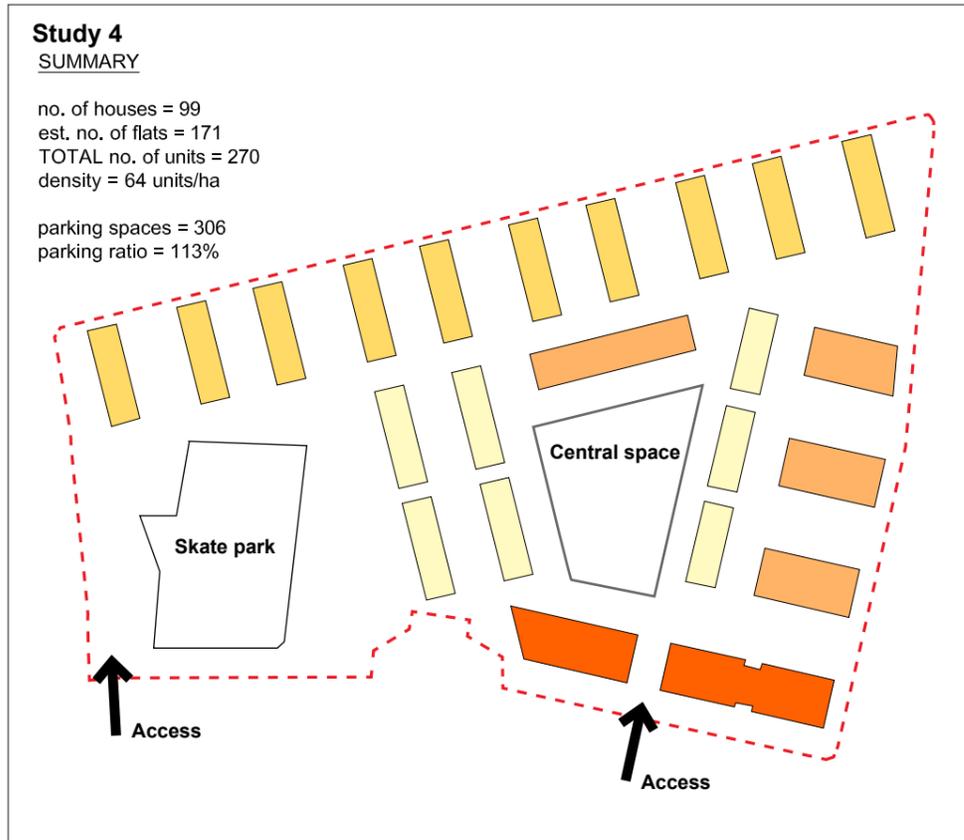
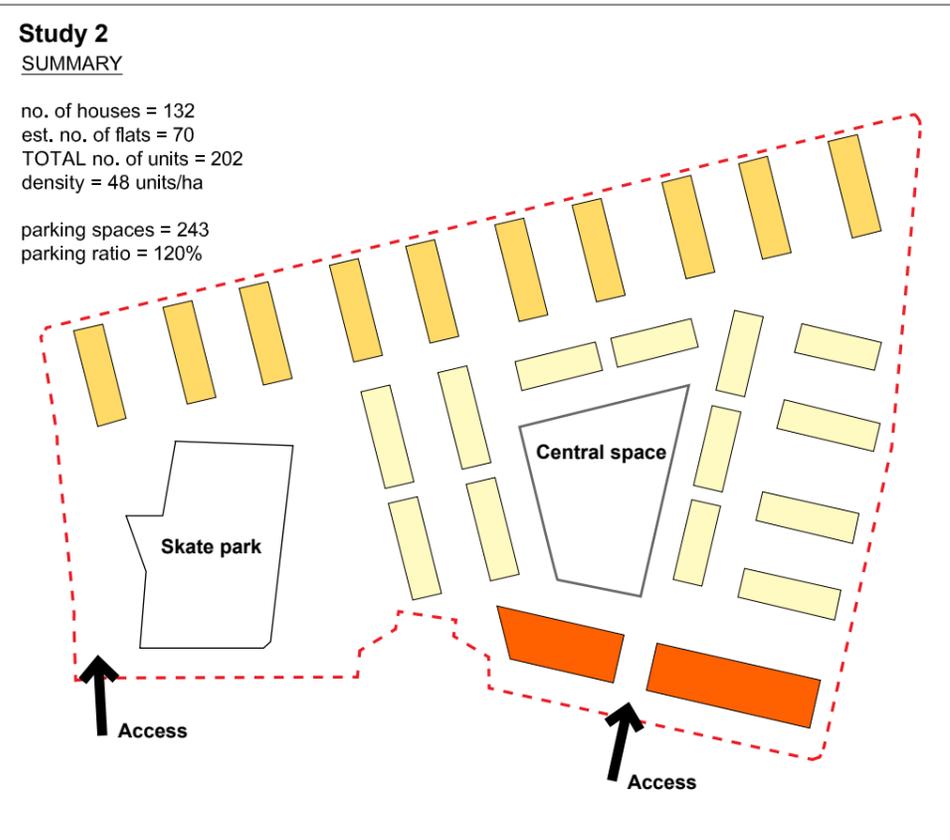
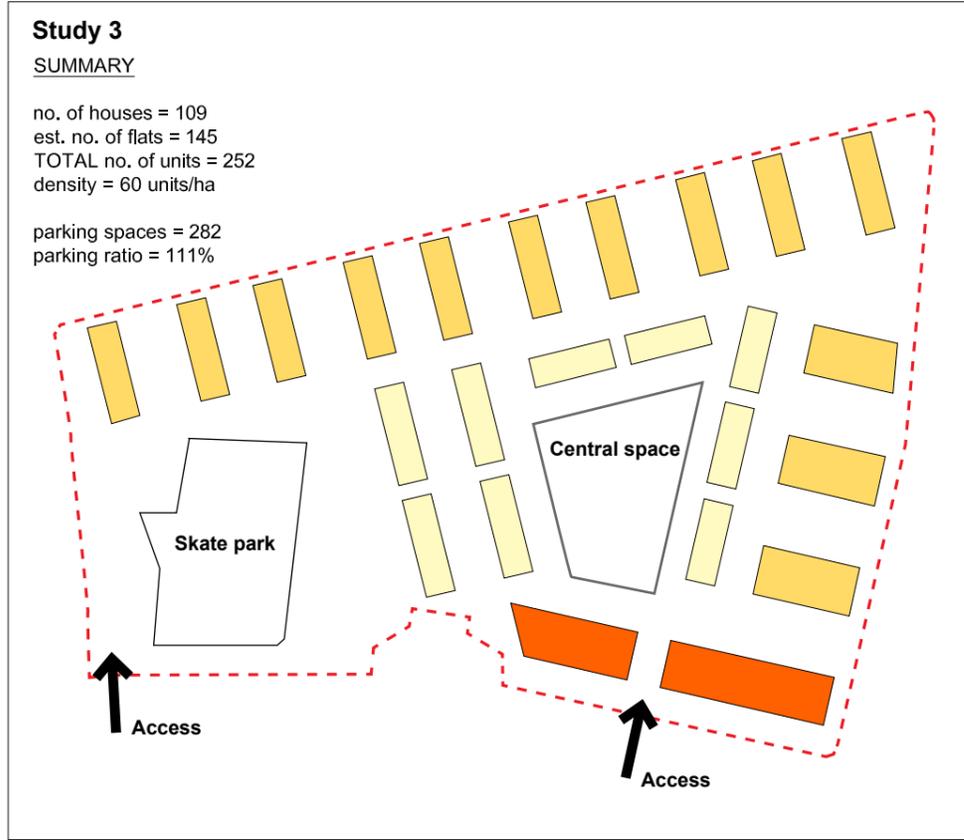
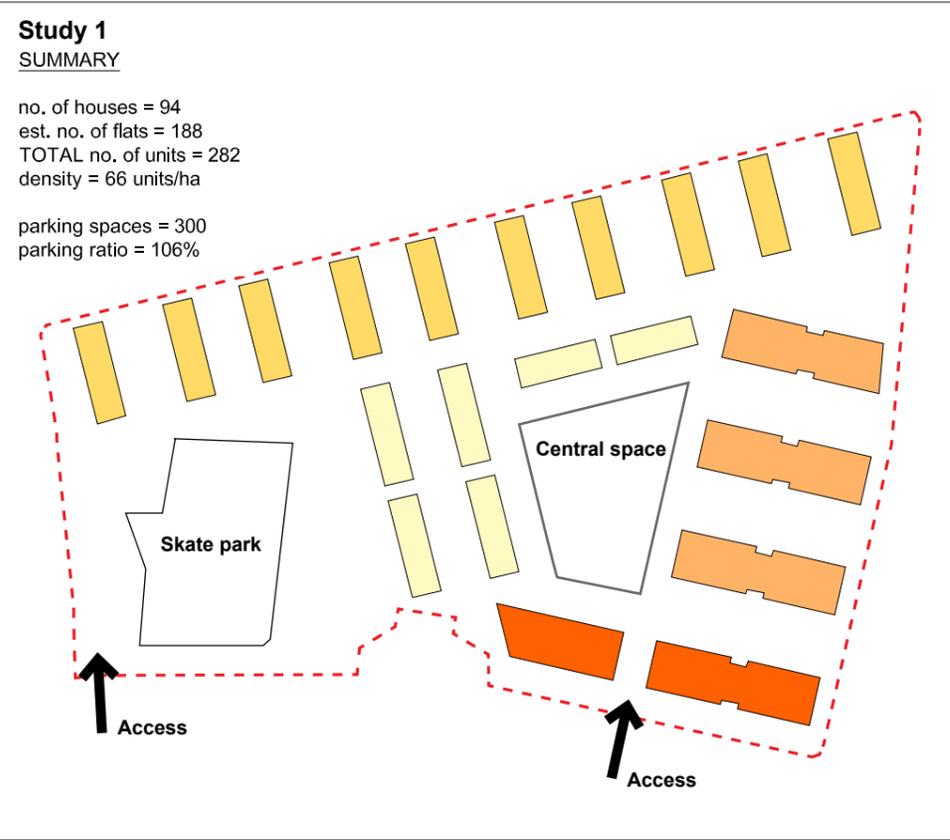
Study 2 reacts to the first option by turning almost all the blocks into rows of terraced houses, with the exception of two blocks of apartments along Upper Rainham Road.

The density is clearly affected and so is the urban form of the masterplan which becomes repetitive and dominated by a single typology.

Study 3 and 4 are a mix of the first two previous options and they seek to achieve a more balanced mix both in terms of typologies and quantum of development.

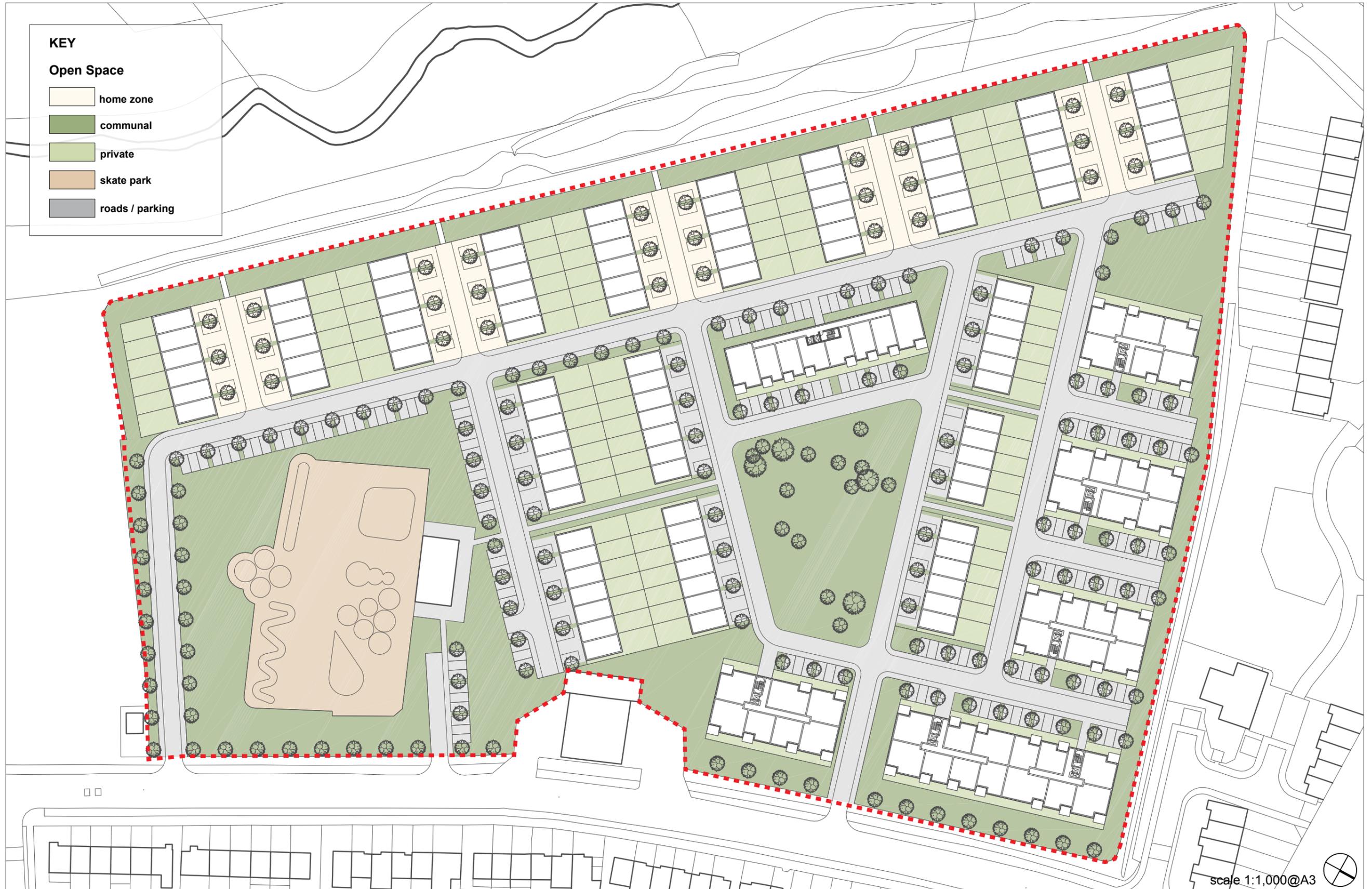
Study 4 in particular generates a more varied central space with houses along the northern and southern edges and flatted buildings on the eastern and western sides.

The final masterplan proposal has therefore been developed on the basis of Study 4, but with some alterations to the apartment blocks.



- 3b houses (2.5 floors)
- 4b houses (3 floors)
- Blocks (3 floors)
- Blocks (4 floors)

Proposed masterplan



Masterplan Concept

As stated above, the final masterplan has been based on Study 4. Due to further design development the blocks in the masterplan have been reduced from four floors to three floors and therefore the number of units and mix have been altered accordingly.

The diagram on this page illustrates the main features of the proposal:

- Building Heights
- Unit Types
- Vehicular Circulation
- Open Space

The proposal delivers 242 residential units with a range of sizes and typologies.

60x1bed flats

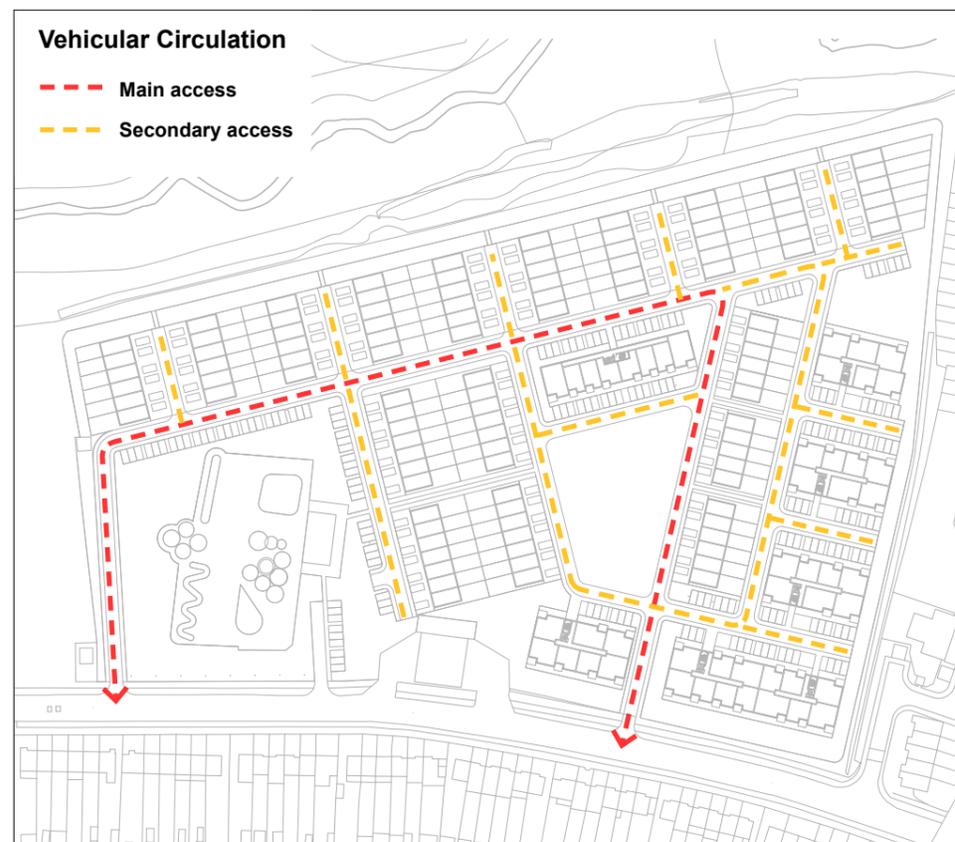
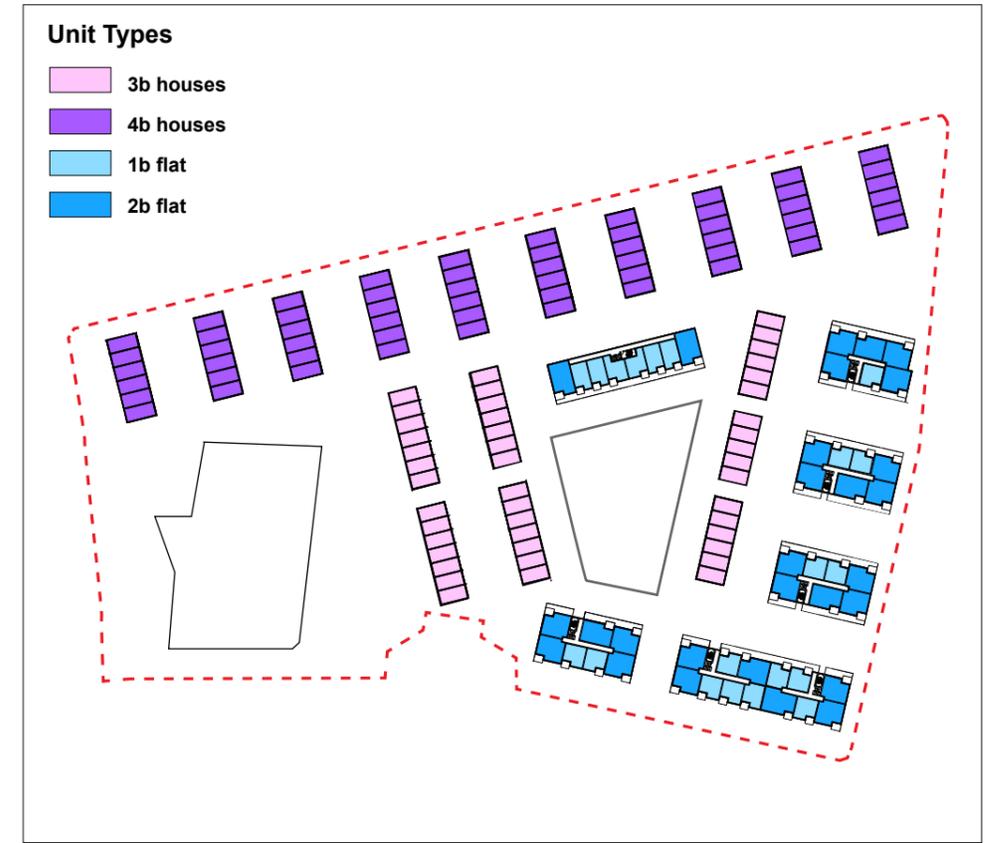
77x2bed flats

45x3bed houses

60x4bed houses

The current mix generates a density of about 57 units/ hectare.

The parking provision is 281 spaces (116%).



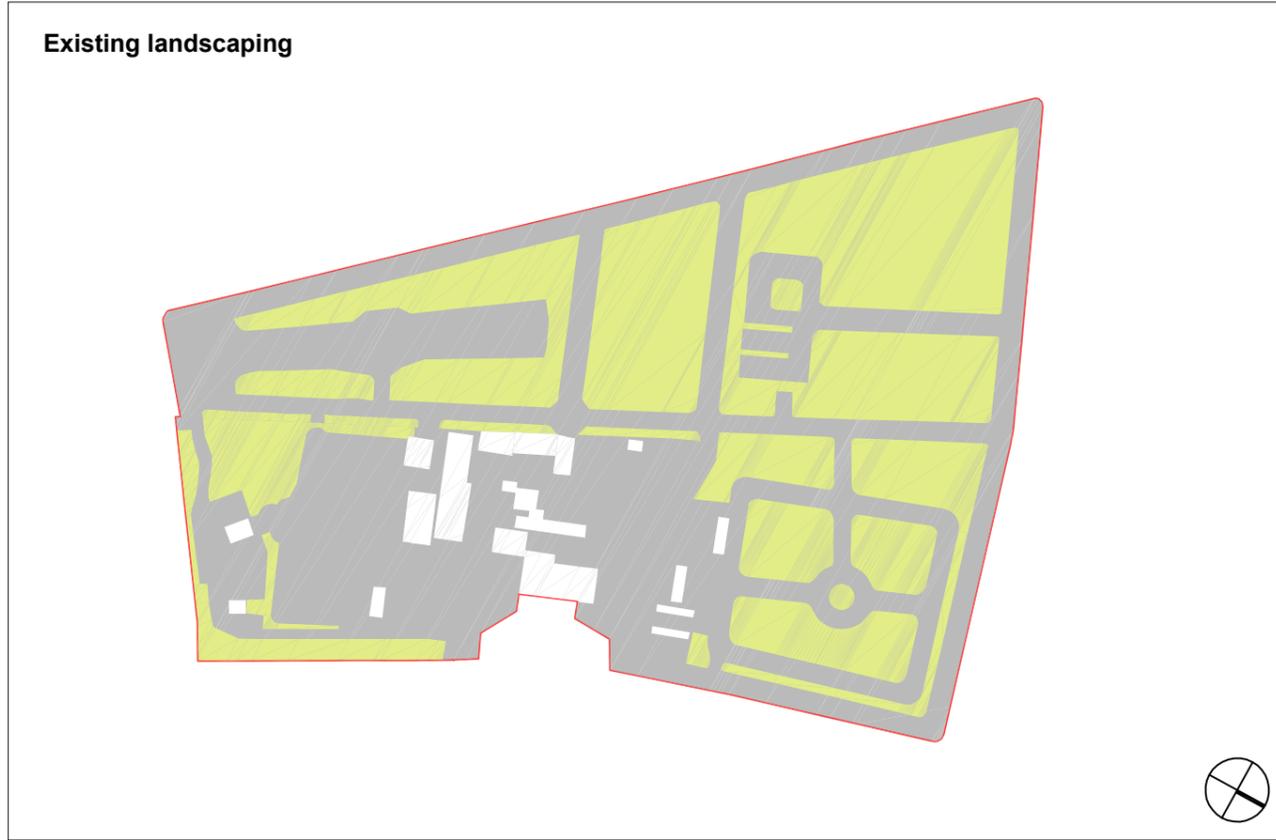
Hard standing

Although included within the Green Belt, the site is not an undeveloped green field and includes a large proportion of hard standing, comprising the skate park and the learner centre facilities and tracks.

The soft landscape area is also of little ecological value, being largely made up of informal mown lawn grass with no trees.

The diagrams on this page compare the proposed masterplan and the existing conditions on the basis of built area, hard standing and grass areas.

The proposed hard standing is roughly the same as the existing, but the soft landscaping will be of vastly superior quality, comprising of private gardens and communal landscaped areas with semi-mature trees.



3D Views



Bird's eye view of the proposed masterplan, from south-east.



Birds's eye view of the proposed masterplan, from north-east.

Formation Architects - precedents

Cambridge City Football Club

Formation Architects submitted a detailed planning application for the redevelopment of this site close to the city centre of Cambridge on behalf of Crest Nicholson in May 2014.

Formation Architects were appointed by Crest Nicholson in September 2013 and submitted the scheme for planning after winning unanimous support from the Cambridge Design and Conservation Panel and the support from the officers after 6 months of pre-planning consultation.

The scheme comprises of 106 units including 53 apartments and 51 houses for families.

The masterplan revolves around a central square as a focal point for the new neighbourhood.

All houses have gardens and upper floor terraces, all flats have generous balconies or roof terraces. Floor to ceiling heights are 2.7m throughout.

The landscaping is inspired by the use of the site as the former Cambridge City Football Ground.



- Key**
- Public open space
 - Private gardens
 - Terrace
 - Shared surface
 - Road
 - Parking
 - Sedum roof on bin and storage units

Bolingbroke Park, Enfield

Formation Architects have designed a major housing development for London and Quadrant Group on a 4.5 hectare site in London Borough of Enfield.

The project comprises 231 new dwellings of which 69 will be terraced and semi-detached houses; the remainder will be 1, 2 and 3 bed flats in 4 storey high apartment buildings.

The development will be known as Bolingbroke Park and has been designed to take advantage of the established woodland setting of the site. The high quality of its details and materials will make a positive contribution to the local built environment. It will feature a number of energy saving features including photo-voltaic roof panels to generate electricity.

The site, which is surrounded by mature trees, generated a layout that reflects its sloping topography and maximizes sunlight and daylight to all dwellings. Formation Architects have been appointed by Quadrant Construction (part of the London & Quadrant Group) to develop the design information towards construction.



Seven Acres, Cambridge

The site forms part of the Great Kneighton (formerly known as Clay Farm) masterplan at the southern border of Cambridge and comprises 128 units including 70 houses and 58 apartments. All dwellings are designed to Code for Sustainable Homes Level 4 and one prototype house to Code Level 5. All units have a floor to ceiling height of 2.7m with 2.9m in the larger 4-bed house types living-rooms. The specifications are being developed in line with Skanska's emerging brand which builds on the Scandinavian heritage of the company.

Ideal Home of the Year Award at the Blue Ribbon Awards 2013. 2013 Gold Best What House? Award, 2013 Bronze Best Sustainable Development What House? Awards 2013. Recognised by Building for Life 12. Overall Winner of the Best Development Multiple Units, UK for the International Property Awards 2012. Shortlisted for The Housing Design Awards 2012. Commended for the Sunday Times British Homes Awards 2012. Highly commended for the House Builder Awards 2012.



Maiden Lane

The site is located on a former light industrial estate at the western edge of the Crayford Marshes. About two thirds of the 6.3ha site is designated as an emergency flood reservoir which offers the opportunity to create a new open space for local residents.

The layout comprises 254 units of which 160 are apartments and 94 are terraced houses, offering a mix of typologies and tenures within the scheme. The key driver was to benefit from the views towards the open land north and east of the site and to ensure a maximum amount of sunlight and privacy to the residents. This has been achieved through a simple legible street layout with the main access road on the north side of the site connecting to traditional tree-lined streets with on street parking. On the southern perimeter of the site is a more intimate shared "home-zone" type of environment.

Formation Architects have worked intensively with a variety of consultants and the client to develop a masterplan on a difficult site that delivers a contemporary approach to suburban habitation.

The delivery of the project hinged on the construction of the *Europa Gym* as part of the Section 106 agreement for the residential development.



**Risebridge Close
Havering**

Report for:
Ptarmigan Land Limited

INTRODUCTION

Overview

AA Environmental Limited (AAe) has been commissioned to produce an Ecological Constraints & Opportunities Note for the site off Risebridge Close, Havering. The aim of this document is to evaluate the ecological constraints on the site, which are summarised below and shown on the attached Constraints Plan (Figure 1), along with providing a range of ecological mitigation and enhancement measures.

This assessment has been based on a walk-over survey of the site and surrounding land, where access was possible (completed on Friday 11 September 2015) a desktop study including a data request from Greenspace Information for Greater London (GiGL) and a brief review of internet resources (e.g. MAGIC, Google Earth aerial imagery and Natural England's websites).

Site Description and Proposals

The site is located to the north of Romford, located off Risebridge Close and is centred at National Grid Reference: TQ 515913. The site is bordered by areas of semi-improved grassland, a golf course, residential properties within Chase Cross and associated roads.

The site itself is dominated by rough grassland (semi-improved), with some boundary hedgerows, woodland belts and scrub present. A restricted area of traditional orchard is also present in the north-eastern corner of the site. A review of the Google Earth imagery suggests that the land use has largely remained unchanged since at least 2006, with the site appearing more managed between 1999 and 2002. The proposals are to develop the site for residential use along with associated infrastructure and Public Open Space (both formal and informal).

ENVIRONMENTAL INFORMATION

Desk-top Study

There are no statutory ecological designated sites on or directly adjacent to the site, according to GiGL or the Multi-agency website, and there are no records of protected or notable species on the site, according to the data search. The nearest ecological statutory designated site is The Manor Local Nature Reserve, which is located approximately 3 km to the north-east of the site. However, Rise Park Stream HvL13, a non-statutory designated Site of Importance for Nature Conservation (SINC), is located adjacent to the western boundary of the site. There are a further fourteen SINC's within 2 km of the site. Further details are provided in Table 1 attached. In addition, although not recorded within the GiGL data search, there is an area of Deciduous Woodland (within the SINC) and an area of Traditional Orchard, both of which are both Priority Habitats under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*.

Walk-over Survey

The site is dominated by rough grassland, with boundary vegetation mainly comprising dense and scattered scrub and tall ruderal vegetation. Hedgerows formed the majority of the field boundaries, with a woodland belt and restricted areas of dense scrub also present. There were a number of drainage ditches along the site boundaries, although the majority of these were dry at the time of the survey. There were also a number of ponds recorded within nearby habitat.

Species

Badgers

Evidence of badgers, in the form of a run with badger hair found and a dung pit, was recorded on the site (TNs 1 and 2 on Figure 1). Although no setts were recorded during the initial walk-over, it is important to note that not all of the site was covered and, as badgers are active, setts could still be found during subsequent visits. The site does provide foraging habitat for badgers.

Bats

Although there were only a few buildings present on the site (land currently tenanted with no access permitted), depending upon the proposals further bat surveys on any buildings scheduled to be demolished will need to be completed to confirm presence/absence of any roosts. In addition, there are a number of mature trees that do have features, such as rot holes and split bark and limbs that do provide roosting opportunities for bats and again further assessment would be required in order to confirm any roosts if any of these trees require felling (locations are shown on Figure 1).

The majority of the site, being dominated by rough grassland with established boundary hedgerows, woodland belts and woodland areas, provides areas of good foraging for bats, with bat activity likely to be concentrated at the field boundaries.

There are no records of bats on the site itself, according to the data search; however, there are records of brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctula*) and leisler's bat (*Nyctalus leisleri*) located within habitat to the north of the site.

Dormice

There are no known records of dormice within 2 km of the site. The majority of the site does not provide suitable habitat for dormice but the established woodlands, interconnecting hedgerows and areas of dense scrub do provide suitable habitat.

Herpetofauna (amphibians and reptiles)

There are a number of ponds present within adjacent land, which may support breeding populations of amphibians (shown on the attached plan). As the site is dominated by rough grassland, with scrub and woodland, it provides suitable habitat for herpetofauna.

The nearest great crested newt (*Triturus cristatus*) record is 0.58 km to the north of the site. There are no known records of reptiles on the site itself, with the nearest reptile being a slow-worm (*Anguis fragilis*) recorded 0.72 km to the west of the site.

Water Voles

Although there are a series of drainage ditches along a number of the hedgerows, these remain dry for long periods and do not provide any habitat for water voles. There are no records of water voles within 2 km of the site.

Other Wildlife

Evidence of fox and deer were recorded. In addition, a few common species of bird, either recorded on the site or flying overhead, including Blackbird (*Turdus merula*), Robin (*Erithacus rubecula*), Carrion Crow (*Corvus corone*), Blue Tit (*Cyanistes caeruleus*), Mistle Thrush (*Turdus viscivorus*), Magpie (*Pica pica*) and Wood Pigeon (*Columba palumbus*), were also recorded.

CONSTRAINTS/FOLLOW-UP SURVEY WORK

Habitats

Apart from an area of traditional orchard present in the north-eastern corner of the site and the woodland belt along the western boundary, no habitats on the site are specifically protected for ecological reasons,

although there may be other constraints such as TPO's on trees and local/national policies (such as retention of hedgerows).

Species

Badger

Follow-up checks for badger could be carried out during other phase 2 surveys to ensure there are no unrecorded setts within the land where access was not permitted. Irrespective of any findings, as badgers are known to be active in the area, standard controls will have to be implemented including:

- any temporary and permanent fencing to be installed should be raised slightly off the ground (200 mm), to allow badgers unrestricted access throughout the site;
- any deep excavations that are to be left open overnight should include a means of escape for any animals that may fall in;
- where possible, works should be limited to the hours from dawn to one hour before sunset;
- the creation of large stock piles of earth should be avoided as these may prove attractive for badgers to excavate new setts;
- badger corridors will be maintained to allow badgers access to adjacent habitat; and
- new landscape planting to include species known to provide a food source for badgers.

Bats

On a scheme of this scale where hedgerows are potentially being removed and there are potential impacts from lighting etc., evening/dawn transect surveys are typically requested to demonstrate the level of bat activity on the site and to identify any mitigation measures that may be required. Bat Conservation Trust guidelines currently state for sites of **medium habitat quality** that one visit and transect must be undertaken during each month that bats are active (April-September). Additional requirements may be to leave a static detector out on site to record any evidence of bat activity.

Standard mitigation should also be implemented such as the use of a sensitive lighting scheme and retention of key hedgerows with dark corridors provided, where practicable.

Breeding Birds

As the site provides some areas of suitable bird nesting habitat, both for ground nesting and within the woodland and hedgerows, it may be necessary to carry out a breeding bird survey. In accordance with standard BBS methodology, three repeat visits are required (first visit is a scoping survey, which we have already completed) and should be carried out during suitable weather in April and May. Evidence of breeding activity by each species will be identified and mapped using standard coding for breeding activity. The criteria used to identify whether or not a species is breeding will be that used for the 1993 national breeding bird atlas (Gibbons, Reid and Chapman, 1993).

In addition to this, any site works likely to affect potential bird nesting habitat should be timed to avoid the main bird nesting season, which, in general, runs from March to August inclusive. If this is not possible, a check should be carried out prior to any clearance works to ensure there are no active nests present, including a check of the buildings on site.

Herpetofauna

As the site supports amphibian and reptile habitat, further surveys at the appropriate time of year and following standard methodology should be carried out to confirm presence/absence of reptiles. It might be necessary to carry out surveys of nearby ponds to confirm presence/absence of great crested newts (an alternative is to carry out eDNA testing). The results of any further surveys would determine whether any specific mitigation/enhancement measures are necessary.

Reptile surveys may be carried out between April and September, however they are optimal in April, May, June and September. Artificial refugia (corrugated tin and felt sheets measuring approximately 1 m²) will be positioned within suitable habitat present on the site. The use of artificial refugia is thought to be the most efficient and effective method for recording the presence of reptiles. The artificial refugia will be left undisturbed for a period of seven days before returning to the site. A number of repeat lifts will then be

carried out on seven separate days and conducted during suitable weather conditions in order to record the maximum number of reptiles basking on or sheltering under the sheets.

Summary

The main constraints on the site identified during the walk-over survey were for herpetofauna, as well as potential survey work for bats, breeding birds and dormice. Ideally the scope of any further Phase II surveys should be discussed and agreed with the LPA's ecologist.

OPPORTUNITIES

Habitats

Enhancement of the existing hedgerows to be retained and planting of new species rich hedgerows.

Also the existing woodland areas could be enhanced with new native planting and sensitive management – e.g. selective thinning to open up areas for the benefit of ground flora, allowing good tree specimens to grow to maturity whilst implementing a coppicing regime on other suitable species and introduce buffer planting with scalloped edges.

As part of the development, certain areas of the site could be managed sympathetically for the benefit of wildlife. Where practicable, grass margins could be allowed to become established as wildflower habitat, and cut less frequently to provide cover for a range of species, allowing plants to set seed and certain invertebrates to complete their life cycle. Allowing certain areas of the site to become less managed will increase the diversity and abundance of insects, which in turn will support more bird life and provide ideal foraging habitat for a range of species. All arisings from management operations should be collected and removed to dedicated composting areas, which could be provided on the site. Any features required to augment the site drainage (as part of Sustainable Urban Drainage Systems), could also be designed to benefit wildlife, such as allowing the establishment of aquatic and marginal vegetation to improve foraging/breeding opportunities for invertebrates and herpetofauna.

Species

Badgers

Retention and strengthening of existing hedgerows and/or replacement species rich hedgerows provided with species known to provide food sources for badgers. Introduction of a sensitive lighting scheme, with dark corridors provided.

Bats

Retention and strengthening of existing hedgerows and woodland areas and/or replacement species-rich hedgerows provided. A series of bat boxes could be installed on some of the established vegetation to be retained or incorporated into the new build to provide enhanced roosting opportunities. New planting could include species of known value for wildlife and the retention and enhancement of existing watercourses and provision of new waterbodies on the site would improve foraging opportunities. Introduction of a sensitive lighting scheme, with dark corridors provided.

Licence application and proportionate mitigation if any confirmed roosts are found and are to be lost to the proposals.

Breeding Birds

Retention and enhancement of existing woodlands, woodland belts and hedgerows and/or replacement species-rich hedgerows provided along with new habitats created as part of the overall landscape strategy. A series of bird boxes could be installed on some of the established vegetation to be retained or incorporated into the new build to provide enhanced nesting opportunities.

In order to retain suitable habitat for ground-nesting birds, areas of the site should be left un-managed, especially during sensitive times of year such as the breeding season (March to August).

Dormice

Retention and enhancement of existing woodlands, woodland belts and hedgerows and/or replacement species-rich hedgerows provided along with new habitats created as part of the overall landscape strategy. This could include thinning tall trees in the existing woodland areas to encourage growth of understorey and the production of more fruits, nuts and insects for food. These areas could be further enhanced using plant species with a known benefit for dormice (such as hazel, oak or honeysuckle). If habitats are isolated, new planting should create links so that there is uninterrupted habitat suitable for dormice.

A series of dormouse nest boxes could be installed on some of the established vegetation to be retained to provide enhanced nesting opportunities

Herpetofauna (amphibians and reptiles)

Measures to enhance the site for herpetofauna could include: introduction of suitable waterbodies located adjacent to natural habitats, provision of rough grassland/wildflower type habitat, allowing scrub to establish and construction of hibernacula. If any confirmed breeding ponds for great crested newts are to be lost then a licence application and proportionate mitigation would need to be provided.

Other wildlife

A range of further enhancement measures could be incorporated into the scheme in order to provide suitable foraging habitat and shelter for brown hares, such as:

- production of flower-rich verges, headlands and beetle banks;
- roadside fencing, or wildlife tunnels; and
- structured landscape buffers.

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CONSTRAINTS PLAN



KEY

	Site Boundary (Indicative)
	Deciduous Woodland Priority Habitat* (SINC)
	Traditional Orchard Priority Habitat*
	Tree of Value for Bats (Indicative Location)
	Target Note
	Waterbody

* Indicative boundary of these areas.

Rev.	Details	Drawn	Date
		Chkd.	

PROJECT
153320
Risebridge Close
Havering

TITLE
Constraints Plan

 **AAe**
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Scale	Date	Rev.
As shown	Sep'15	
	Drawn CA	Chkd. ARB
	Drg No. Figure 1	

TABLE 1: DATA SEARCH SUMMARY

Designated Sites		
Description	Protection/designation	Distance and direction from site
Deciduous Woodland	Priority Habitat	On site
Traditional Orchards	Priority Habitat	On site
Rise Park Stream	Site of Importance for Nature Conservation (Local Importance)	Adjacent to western site boundary
Bedfords Park	Site of Importance for Nature Conservation (Metropolitan Importance)	0.15 km to the N
Bob's Lane and Ash Lane	Site of Importance for Nature Conservation (Local Importance)	0.3 km to the S and 0.4 km to the E
Bower School Wood	Site of Importance for Nature Conservation (Borough Importance Grade 2)	0.55 km to the NNW
Romford Golf Course	Site of Importance for Nature Conservation (Borough Importance Grade 1)	0.6 km to the SE
Raphael Park	Site of Importance for Nature Conservation (Local Importance)	0.65 km to the S
Immanuel School Wood	Site of Importance for Nature Conservation (Borough Importance Grade 2)	0.7 km to the NNW
Noak Hill Archery Club field	Site of Importance for Nature Conservation (Borough Importance Grade 2)	0.8 km to the E
Bellvue	Site of Importance for Nature Conservation (Borough Importance Grade 1)	1.1 km to the NE
Havering Country Park	Site of Importance for Nature Conservation (Metropolitan Importance)	1.2 km to the NW
Bedford's Farm Wood	Site of Importance for Nature Conservation (Borough Importance Grade 2)	1.3 km to the NE
Broxhill Road Wood	Site of Importance for Nature Conservation (Borough Importance Grade 2)	1.75 km to the NE
South Park Plantation	Site of Importance for Nature Conservation (Borough Importance Grade 2)	1.8 km to the N
River Rom in North-west Havering	Site of Importance for Nature Conservation (Borough Importance Grade 2)	1.8 km to the W
Protected/notable Species		
Description	Protection/designation	Distance and direction from site
House Sparrow (<i>Passer domesticus</i>)	Priority Species	0.21 km to the N
Starling (<i>Sturnus vulgaris</i>)	Priority Species	0.37 km to the SW
Bullfinch (<i>Pyrrhula pyrrhula</i>)	Priority Species	0.4 km to the N
Herring Gull (<i>Larus argentatus</i>)	Priority Species	0.45 km to the N
Great crested newt (<i>Triturus cristatus</i>)	European Protected Species, Protected Species & Priority Species	0.58 km to the N
Song Thrush (<i>Turdus philomelos</i>)	Priority Species	0.6 km to the N
Brambling (<i>Fringilla montifringilla</i>)	Protected Species	0.6 km to the N
Redwing (<i>Turdus iliacus</i>)	Protected Species	0.6 km to the N
Kingfisher (<i>Alcedo atthis</i>)	Protected Species	0.61 km to the N
West European hedgehog (<i>Erinaceus europaeus</i>)	Priority Species	0.69 km to the N
Slow-worm (<i>Anguis fragilis</i>)	Protected Species & Priority Species	0.72 km to the W

Fieldfare (<i>Turdus pilaris</i>)	Protected Species	0.78 km to the N
Noctule bat (<i>Nyctalus noctula</i>)	European Protected Species, Protected Species & Priority Species	0.86 km to the N
Skylark (<i>Alauda arvensis</i>)	Priority Species	Within 1 km of the site (no Grid Reference provided)
Yellowhammer (<i>Emberiza citrinella</i>)	Priority Species	Within 1 km of the site (no Grid Reference provided)
Reed Bunting (<i>Emberiza schoeniclus</i>)	Priority Species	Within 1 km of the site (no Grid Reference provided)
Lapland Bunting (<i>Calcarius lapponicus</i>)	Protected Species	Within 1 km of the site (no Grid Reference provided)
Grass snake (<i>Natrix natrix</i>)	Protected Species & Priority Species	1.04 km to the W
Dunnock (<i>Prunella modularis</i>)	Priority Species	1.05 km to the N
Tree Pipit (<i>Anthus trivialis</i>)	Priority Species	1.15 km to the N
Cuckoo (<i>Cuculus canorus</i>)	Priority Species	1.15 km to the N
Lesser Spotted Woodpecker (<i>Dendrocopos minor</i>)	Priority Species	1.15 km to the N
Grasshopper Warbler (<i>Locustella naevia</i>)	Priority Species	1.15 km to the N
Yellow Wagtail (<i>Motacilla flava</i>)	Priority Species	1.15 km to the N
Spotted Flycatcher (<i>Muscicapa striata</i>)	Priority Species	1.15 km to the N
Lapwing (<i>Vanellus vanellus</i>)	Priority Species	1.15 km to the N
Red Kite (<i>Milvus milvus</i>)	Protected Species	1.15 km to the N
Greenshank (<i>Tringa nebularia</i>)	Protected Species	1.15 km to the N
Common Crossbill (<i>Loxia curvirostra</i>)	Protected Species	1.15 km to the N
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	European Protected Species & Protected Species	1.16 km to the W
Leisler's bat (<i>Nyctalus leisleri</i>)	European Protected Species & Protected Species	1.31 km to the N
Brown long-eared bat (<i>Plecotus auritus</i>)	European Protected Species, Protected Species & Priority Species	1.76 km to the N
Grey Partridge (<i>Perdix perdix</i>)	Priority Species	1.82 km to the N
Ring Ouzel (<i>Turdus torquatus</i>)	Priority Species	1.82 km to the N
Merlin (<i>Falco columbarius</i>)	Protected Species	1.82 km to the N
Whimbrel (<i>Numenius phaeopus</i>)	Protected Species	1.82 km to the N
Osprey (<i>Pandion haliaetus</i>)	Protected Species	1.82 km to the N
Honey-buzzard (<i>Pernis apivorus</i>)	Protected Species	1.82 km to the N
Wryneck (<i>Jynx torquilla</i>)	Protected Species & Priority Species	1.82 km to the N
Turtle Dove (<i>Streptopelia turtur</i>)	Priority Species	1.85 km to the SW
Wood Warbler (<i>Phylloscopus sibilatrix</i>)	Priority Species	1.91 km to the NW
Marsh Tit (<i>Poecile palustris</i>)	Priority Species	1.91 km to the NW
Eurasian badger (<i>Meles meles</i>)	Badgers Act (1992)	Within 2 km of the site (confidential record)
<p>European Protected Species = species listed under The Habitats Directive Annexes II and IV Protected Species = species listed under the Wildlife and Countryside Act 1981 (as amended) Schedules 1, 5 and 8 Priority Species = species listed under the Natural Environment and Rural Communities (NERC) Act 2006 Section 41</p>		

Development Framework Document Land at Risebridge Chase, Romford Ptarmigan

5 October 2015



PTARMIGAN



CONTENTS

1 Introduction

2 Site Location

3 Strategic Accessibility and Opportunities

4 Site Opportunities and Constraints

5 Concept Masterplan and Deliverability



1

Introduction

This Development Framework Document has been prepared on behalf of Ptarmigan in order to provide the Council with further information on the availability, suitability and deliverability of the land at Risebridge Chase, Romford.

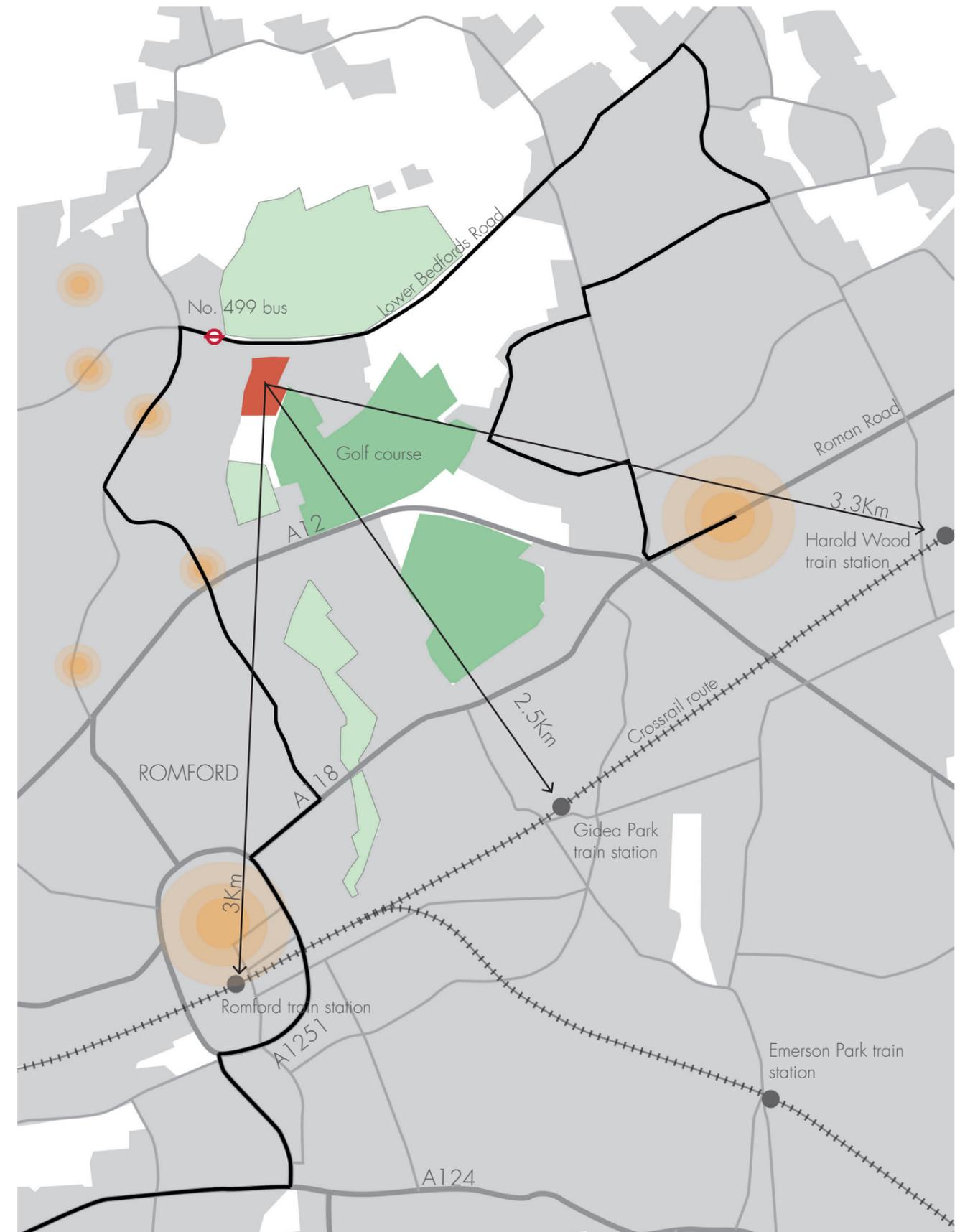
It provides an overview of the detailed technical and planning assessment of the deliverability of the site that will guide the design approach to the proposed development.

It sets out:-

2. Site Location
3. Strategic Accessibility and Opportunities
4. Site Opportunities and Constraints
5. Concept Masterplan and deliverability



Images showing the range of residential character in the area



Context

2 SITE LOCATION

The site is located to the north of Romford town centre in the suburb of Chase Cross. The site lies on the edge of the urban area and is surrounded by urban forms, with housing surrounding the boundaries of the site to the north, east and west. The Risebridge golf course lies to the south east, providing separation between the site and the developed areas of Harold Hill.

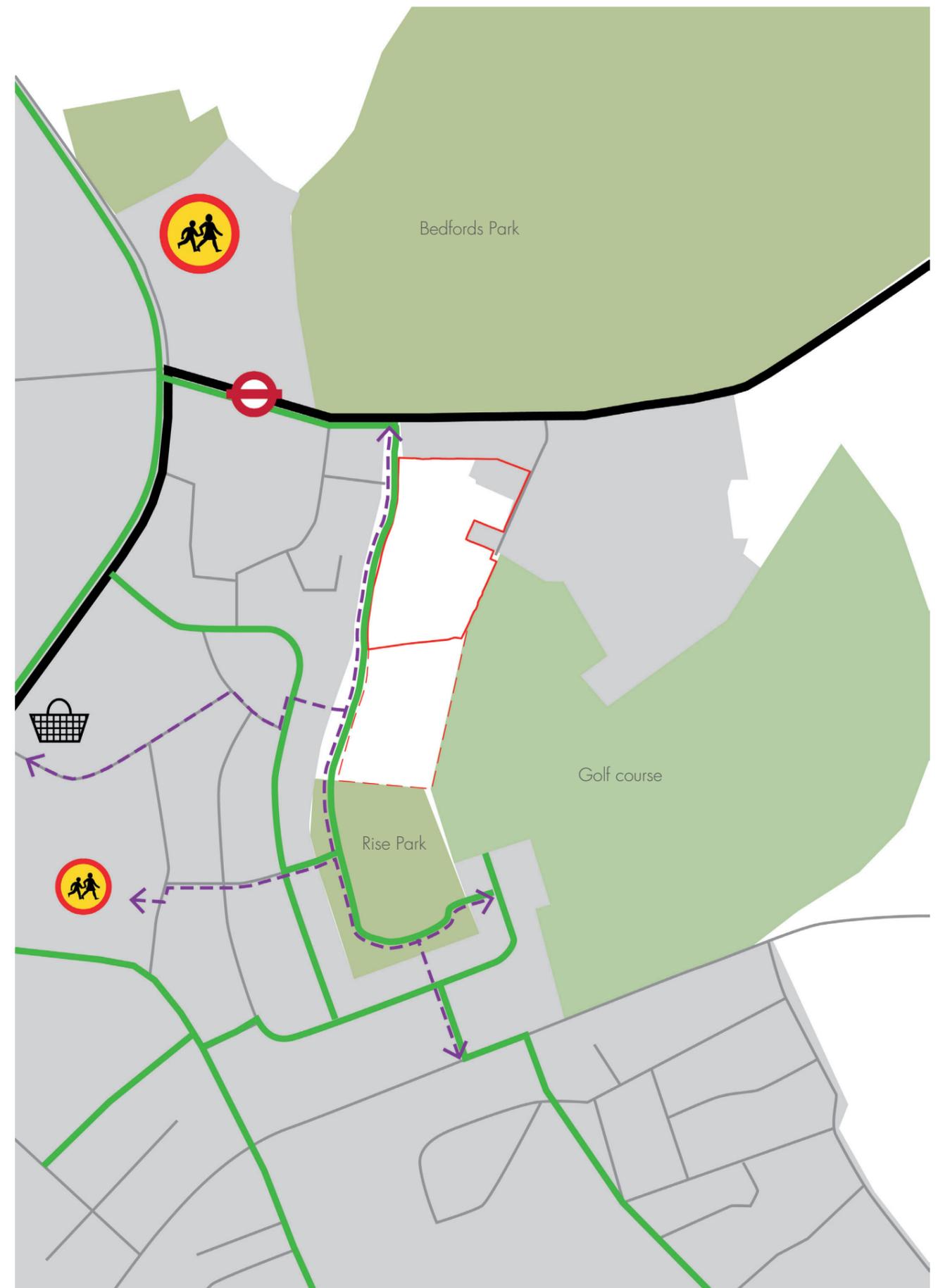
To the north of Lower Bedfords Road lies Bedfords Park which is accessible via a public footpath that runs along the western boundary of the site. The land to the south of the site is currently unused scrubland to the north of Rise Park. The development of the site would provide an opportunity to open up the land to the south for development and provide an opportunity to create a direct and attractive link between Rise Park and Bedfords Park.

There are a number of services, shops and amenities in the local centres at Gobian's Avenue, Moray Way, Pettits Boulevard and Chase Cross Road, all of which are within easy walking distance of the site. The local highway and footpath network also provides access to the facilities and amenities of the larger centres of Romford, Gidea Park and Harold Wood.

- Key
-  The site
 -  Further opportunity land
 -  Local bus stop
 -  Bus route
 -  Local shops
 -  Infant school
 -  Academy school
 -  Pedestrian access
 -  Quiet and off-road cycle routes
 -  Local parks



From the south, the site is completely framed by hedgerow. Bedford Park woodland is to the rear.



Transport and local facilities

3

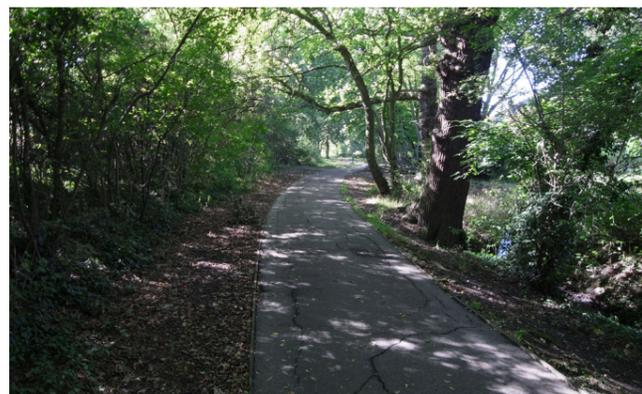
STRATEGIC ACCESSIBILITY AND OPPORTUNITIES

The site is one of the potential options being considered to accommodate new growth. It is located within the Green Belt, but is well contained and provides an opportunity to accommodate development within the context of the existing urban area. As a result, the site is considered to serve a very limited Green Belt function.

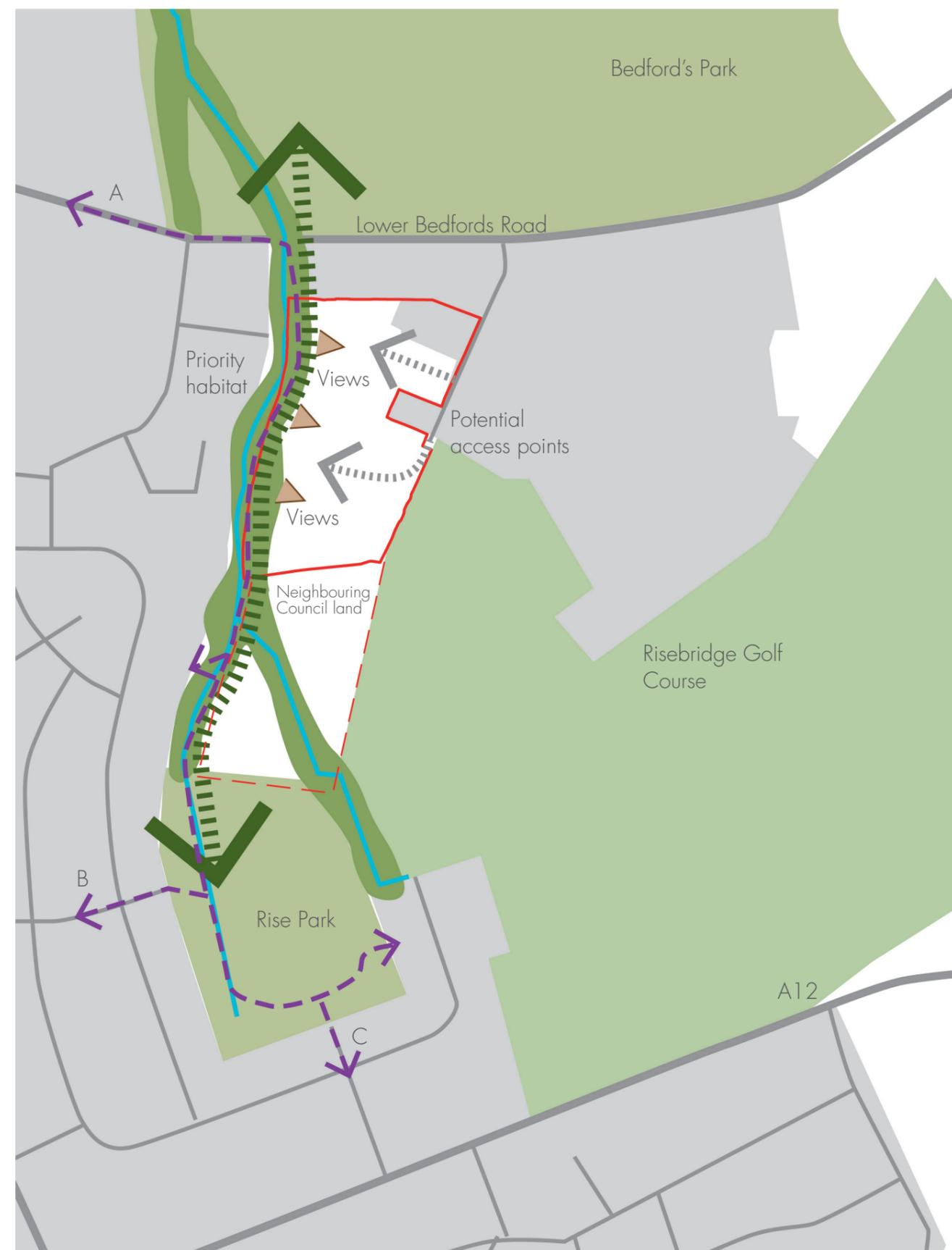
The site is well located in terms of the strategic public transport network, with local bus service number 499 to Romford. The local cycle route network provides access to Romford town centre and Collier Row. The railway stations at Romford, Gidea Park and Harold Wood are on the Greater Anglia Railway Line and are part of the Crossrail network. These stations are approximately 2.5 to 3km away and easily accessible by bicycle. The site is well located to provide access to a range of education facilities. The nursery school at Rise Park and secondary school Bower Park Academy are all accessible.

The alternative Green Belt sites being considered by the Council are distributed fairly evenly around the fringes of the Borough. The alternative sites include a mix of large sites that are situated away from existing urban boundaries or within more rural settings with limited services and facilities.

- Key
- A Bower Park Academy 600m
 - B Park Rise Infant School 700m
 - C Raphael Park 1 km



Sequence of open spaces, from Bedford Park, along the ecology corridor to Rise Park.



Site orientation, open space network and the pedestrian links through the area.

5

CONCEPT MASTERPLAN AND DELIVERABLES

This detailed assessment has confirmed that the site is available and suitable for development and is deliverable within the next five years.

The concept Masterplan for the site identifies opportunities to:

- Locate development in an accessible location, with a range of modes of travel available including bus, rail, the local footpath and cycle routes;
- Maximise ecological assets at the site and enhance biodiversity; and,
- Provide a wider range of housing in a location that serves a limited Green Belt function.

- Key
-  The site
 -  Development areas
 -  Key building at entrance
 -  Green route through to priority habitat
 -  Building frontage at arrival
 -  Building frontage along open space
 -  Building frontage along community street
 -  Existing ponds to be retained
 -  Footpath connections



Concept masterplan



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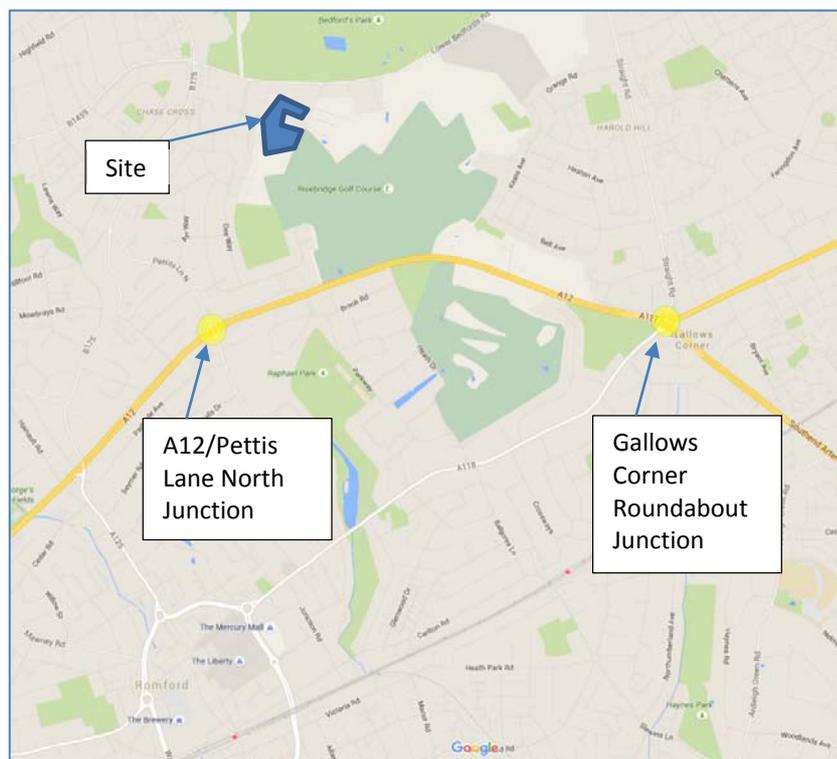
TECHNICAL NOTE

Project No: ITL11193
Project Title: Land at Risebridge Chase, Havering
Title: Site Highways Appraisal
Ref: JD/ITL11193-001 TN
Date: 8 September 2015

1.1 Introduction

- 1.1.1 i-Transport has been commissioned by Ptarmigan Land Limited to provide traffic and transport advice in relation to their potential development site, land at Risebridge Chase, in the London Borough of Havering.
- 1.1.2 The information in this note has been produced after a detailed site visit conducted on Wednesday 2nd September 2015 during the PM peak hour.
- 1.1.3 The site lies to the north of Romford, immediately north of the A12 and adjacent to Risebridge golf course.

Figure 1.1: Site Location



SECTION 2 Highway Network

- 2.1.1 The site is in close proximity to the strategic road links, the A12 and A127.
- 2.1.2 The routes to/from the strategic road network are described below:
- The site is accessed from the A12 and A127 east via the Gallows Corner roundabout junction, Straight Road, Lower Bedford Road and Risebridge Chase; and
 - The site is accessed from the A12 west via the A12/Pettits Lane North junction, Havering Road (B175), Lower Bedford Road and Risebridge Chase.
- 2.1.3 Gallows Corner roundabout junction is congested during peak times and any traffic entering from Straight Road has to accept small gaps in order to access the roundabout.
- 2.1.4 Straight Road is an urban 30mph 2-way single carriageway residential road running north/south with at least 2.0m footways and a long bus only lane in the southbound direction on the approach to Gallows Corner.
- 2.1.5 Where Straight Road meets Lower Bedford Road a new junction is currently under construction. The previous junction arrangement took the form of a staggered four arm signalised junction. The proposed that the new junction arrangement will be a four arm roundabout.
- 2.1.6 According to TfL, the junction was selected for review because of a history of complaints about motor traffic congestion, a relatively poor casualty record and because of locally committed and expected development in the Harold Hill area and especially the residential development of the former Whitworth Centre (Persimmon) and the proposed Broxhill Park on the former Broxhill Centre.
- 2.1.7 Lower Bedford Road is an east/west 40mph 2-way single carriageway road, more rural in nature with a single 2m footway running along its southern side and a small width of verge and hedgerow on its northern side.
- 2.1.8 On the approach to Risebridge Chase from the east, Lower Bedford Road reduces from 40mph to 30mph.

- 2.1.9 Risebridge Chase forms a mini roundabout where it meets with Lower Bedford Road. The junction is small and it is difficult to egress when the westbound flow is heavy. It is likely that this junction will need upgrading, although this can be assessed in any transport assessment.
- 2.1.10 Risebridge Chase runs up to the boundary of the site. It is a rural access road that provides access to a handful of residential properties, a farm and the Risebridge golf course. Risebridge Chase has verge and footways on either side of the carriageway with existing lighting, as shown in **Figure 2.1**.

Figure 2.1: Risebridge Chase, Showing Footways and Verge

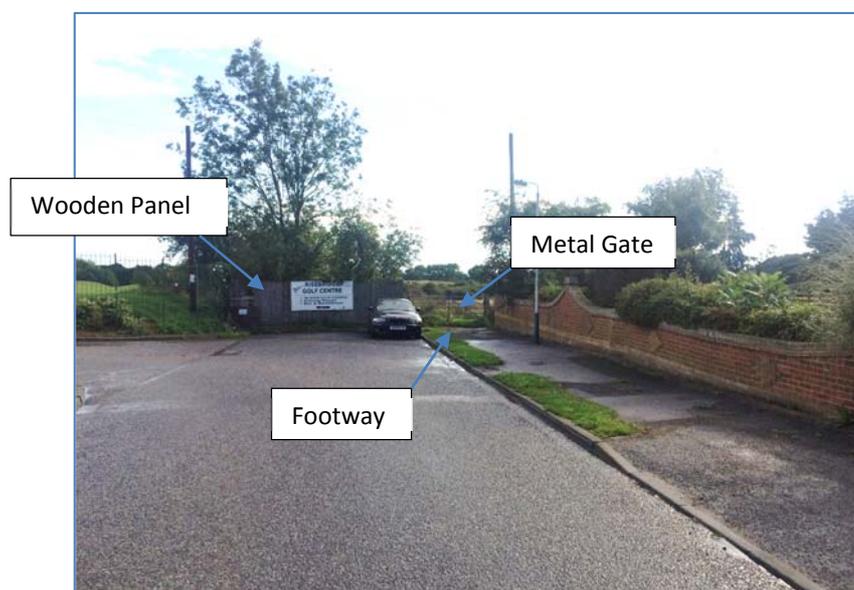


SECTION 3 Existing Access To the Site

- 3.1.1 As stated earlier in the note, footways exist on Risebridge Chase and Lower Bedford Road. The closest bus stops are located on Lower Bedford Road to the West of the site and are approximately 580m from the southern end of Risebridge Chase. Please note that these are further than the 400m walk distance usually required for bus stop access to new developments.
- 3.1.2 The sites PTAL is 1a which is poor. More bus stops and services are located to the West but they are beyond the maximum walk distance cut off.

- 3.1.3 A public footpath exists on the western boundary of the site and connects to Rise Park, Lower Bedford Road and other residential areas to the south and west of the site. Where the public footpath meets Lower Bedford Road there is a Puffin Crossing allowing safe crossing to a footway on the northern side of the carriageway. A connection to the public footpath from the site could provide a shorter route from the development to Lower Bedford Road and the existing bus stops.
- 3.1.4 Romford lies within the Thames Gateway Area and will benefit from the following sustainable transport improvements:
- East London Transit – Transport for London – 2012/2017;
 - Crossrail – Cross London Rail links – 2017;
 - c2c Improvements – c2c Railway;
 - Network Rail, Department for Transport Rail Group (no date yet fixed);and
 - London bus network improvements – Transport for London.
- 3.1.5 Currently the site doesn't have a formal vehicular access, although the site can be accessed through a gate across a footway. A wooden panel is located next to the metal gate and both are located between the southern end of Risebridge Chase and the site boundary, and can be seen in **Figure 3.1** below.

Figure 3.1: Existing Site Access



- 3.1.6 The metal gate is set at 90 degrees to the existing house at the bottom of Risebridge Chase and is wide enough for only one car to pass through.
- 3.1.7 Behind the wooden panel is a large drainage channel, about 1m wide that runs south along the eastern edge of the site.
- 3.1.8 **Figure 3.2** shows a photo taken looking at the aforementioned metal gate and behind the fence panel. A fencepost can be seen marking the top of the drainage channel.

Figure 3.2: Ditch Location



SECTION 4 Future Vehicular Access

- 4.1.1 Section 6 of the London Borough of Havering supplementary residential design guidance states the following, on Movement and Accessibility:

“The access to and circulation through a development should integrate with and improve the existing movement patterns of the wider area. A network of well-connected streets should be provided that offers a choice of routes with easy access to local amenities, open space, the public transport network and established routes.

Infill developments should pay particular attention to the way they link together the areas that surround the site to avoid creating isolated enclaves of development. However, the need for permeability should still maintain safety, security and privacy. Routes into and through a development should minimise areas where the private activities of residents are visible to the public, and all access points should be clearly visible.”

4.1.2 The guidance therefore references Manual for Streets 1 and advises against cul-de-sac arrangements.

4.1.3 Due to the sites location, integration with the surrounding movement pattern is only really possible on the sites eastern side where Risebridge Chase is located and the sites western side if a connection to the existing public footpath is made.

4.1.4 The design guide goes on to state ,

“...ensure new design and layout is oriented around the needs of pedestrians, cyclists and connectivity to the public transport network. Ensure new residential layouts are easy to understand and navigate around..”

4.1.5 It is most likely that the highway authority will require a two-way vehicular access of 5.5m with at least one 2-2.5m footway adjoining Risebridge Chase. This would result in a minimum of a 7.5m access width onto Risebridge Chase.

4.1.6 This access width is possible in two locations as shown on **Figure 4.1**.

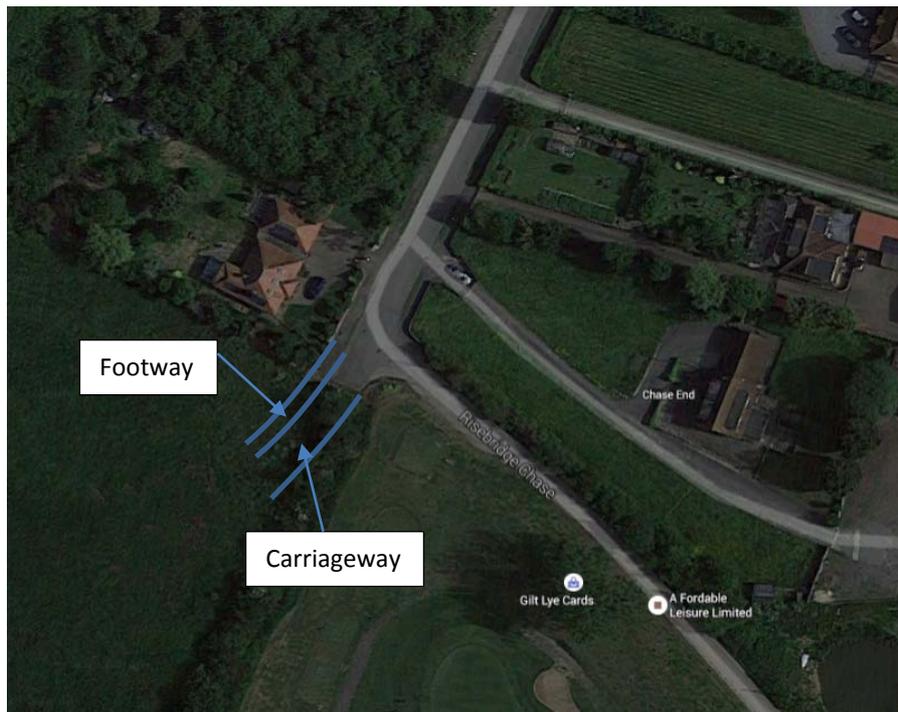
Figure 4.1: Possible Vehicular Access Location



4.1.7 The site access in location 1 would take the form of a priority junction with Risebridge Road.

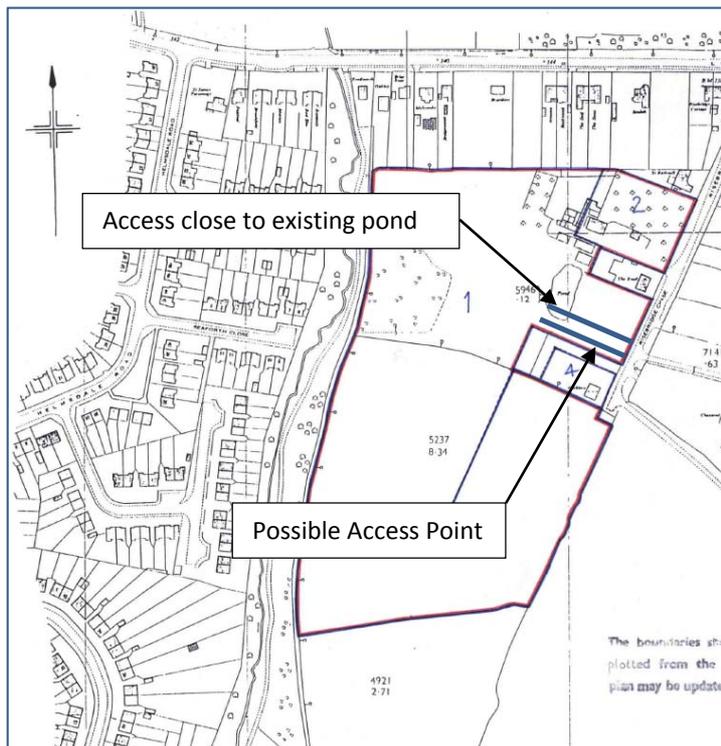
4.1.8 The junction is possible in terms of visibility, width and connection to the public highway, hatched in pink in Figure 4.1. However, a junction in this location would require building carriageway over the existing drainage ditch that runs along the eastern boundary of the site, topographic survey is required to understand the impact of the drainage ditch on the access works.

4.1.9 **Figure 4.2** shows what the access junction would look like.

Figure 4.2 Site access example, location 1

- 4.1.10 An alternative location for the site access is shown at location 2 shown in figure 4.1. The site access would take the form of a priority junction with Risebridge Road.
- 4.1.11 The junction is possible in terms of visibility, width and connection to the public highway, there are some utilities in the existing footway but they look to be easily avoided. It is most likely that a footway on either side of the access road would be required at this location.
- 4.1.12 The access road at this point will come into conflict with an existing pond, the extent of this should be investigated, and it was not accessible due to heavy vegetation during the site visit.
- 4.1.13 Figure 4.3 shows the potential location and width of the access, it also highlights the potential conflict with the pond.

Figure 4.3 Site access example, location 2



SECTION 5 Conclusions

5.1.1 A summary of the main findings are set out below:

- The site is located in a PTAL of 1A which is poor in terms of public transport accessibility, the nearest bus stop is over 400m away.
- There is an existing public footway to the west of the site, it may be possible to connect to this to improve the accessibility;
- The local authority will be looking for contributions to improve the accessibility of the site;
- The site visit identified two locations for potential vehicular access. Either location is possible in highways terms;
- Both potential access junction locations require topographical information in order to work up any access designs as both have existing water features;
- The access junction will require 2-way traffic movement and at least one footway with a minimum total width of 7.5m;and

- The junction onto the Lower Bedford Road is currently a mini-roundabout, due to the heavier flows on Lower Bedford Road, traffic will have difficulty exiting Risebridge Chase. The junction may need upgrading, although a larger roundabout is not possible due to the lack of available highway land. An alternative would take the form of a signalised junction.

LAND ADJACENT IVY HOLT NORTH ROAD HAVERING ATTE BOWER RM4 1PS

Introduction

This statement has been prepared to allow The London Borough of Havering to consider the above site for future development and to justify the scheme against relevant planning policies.

Development Description

This proposed use of the site would be for residential purposes and vehicular access to any dwellings/dwellings would be taken from new crossovers along North Road.

Planning Considerations

The local LDF seeks to ensure that new developments are satisfactorily located and are of a high standard of design and layout which is compatible with the character of the surrounding area and does not prejudice the environment of the occupiers or adjacent properties.

The general thrust of national and regional is to secure sustainable patterns of development and regeneration through the efficient re-use of previously developed urban land, concentrating development at accessible locations and transport nodes. The councils emerging LDF reinforces this through stating a presumption for the redevelopment of non designates sites within the urban area for residential use.

It is considered that in principle, the site is well placed for residential development in planning terms. It is located in close to a range of community, service and recreational facilities with public transport connections linking the site to Romford and Epping and further afield to London.

In accordance with the aims of sustainable regeneration, the proposal of the construction of new sustainable residential accommodation will assist in the regeneration of the wider area. It will provide much needed new housing in this part of the borough and will contribute to meeting the councils housing requirements of new dwellings per annum.

It also represents an efficient use of the site, which will allow the proposed development to integrate with the existing properties and buildings in proximity of the surrounding area.

At present the site is adjacent Ivy Holt and has been used as a builder's yard/merchants for many years. This use is still in operation.

The proposed new use would be a great improvement on the current situation as it would be more in keeping with this residential area. It also should be noted next to the site is a school.

The site is situated within easy reach of many local amenities including schools, shops, supermarkets, places of worship, public open spaces, social venues and a large number of employment areas.



Ivy Holt Site North Road Stapleford Abbots



Yard and School



Yard 1



Yard 2

LAND AT NORTH ROAD HAVERING ATTE BOWER RM4

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In accordance with the aims of sustainable regeneration, the proposal of the construction of new sustainable residential accommodation will assist in the regeneration of the wider area. It will provide much needed new housing in this part of the borough and will contribute to meeting the councils housing requirements of new dwellings per annum.

It also represents an efficient use of the site, which will allow the proposed development to integrate with the existing properties and buildings in proximity of the surrounding area. The site is an infill of land between 19 North Road and Liberty cottages.

The site is situated within easy reach of many local amenities including schools, shops, supermarkets, places of worship, public open spaces, social venues and a large number of employment areas.



19 North Road Stapleford Abbots



Site 1



Site 2



Site 3



Liberty Cottages

GB51 – Land north of Eastern Avenue East, Romford, London Borough of Havering**Additional planning policy information submitted by Old Libertians War Memorial Charitable Trust - March 2016****1. Introduction**

This written representation is intended to assist with the assessment by the London Borough of Havering of the suitability for development of this 4.1ha site, currently within the Metropolitan Green Belt. It is accompanied by a Technical Note prepared by Mayer Brown, which outline the opportunities and constraints of this site and consequently the development potential. It contains a plan demonstrating the suitability of the site for development in light of the opportunities and constraints identified.

The site is deliverable (suitable, available and viable) and offers the opportunity to accommodate a high quality development of up to 150 homes alongside community facilities and associated green infrastructure.

The site is not in agricultural use and is unconnected to a farming unit. There is a temporary sports field (used for weekend youth football) with associated club building on the site but no formal designation for amenity or recreation.

The site has the potential to secure formal public open space, permanent public access and provision of high quality all-weather sports for a wider range of users than is currently the case. There are several options to relocate the grass playing pitches within the wider area.

2. Location

The site lies on the edge of Romford, adjoining the Harold Hill District of the town. Residential areas lie immediately to the north and east. There is vacant land (Meadow Farm) next to a scrapyards to the west. A mature hedgerow and tree belt partially screens the A12 (Eastern Avenue East), which runs immediately to the south.

The site has a key locational advantage over many other Metropolitan Green Belt sites in the District; it does not project out from the built up area into the open countryside. Instead, it comprises undeveloped land that is visually contained by an existing dual carriageway. Development of the site would infill this land to meet this existing physical barrier. South of the dual carriageway, the Romford Golf Club and the Gidea Park Sports Ground would still maintain the openness between the Harold Hill and Gidea Park Districts of the town.

Its location between existing housing and the A12 also provides an opportunity to increase densities as part of a noise mitigation strategy of benefit to existing residents.

3. Accessibility

The nearby Gidea Park and Harold Wood stations (under 2km) are served by the Great Eastern Main Line, which runs into Liverpool Street. Bus routes connect with these stations and various town and District centres.

There are local centres including Masefield Crescent within 400m. Hilldene School Grange Road is within 1km and a Tesco supermarket within 800m. There are many recreational facilities including the local Keats Avenue playsite within 400m to the west and the well-equipped Gidea Park Sports Ground within 800m to the south east. Romford town contains a District Centre and plentiful employment sites.

4. Designations

There are no environmental designations (either ecological or landscape).

The site does not lie close to a conservation area or listed building, or within an area of special character.

5. Green Belt function

The site makes a limited contribution to the purposes of including land within the Green Belt, therefore its value in Green Belt policy terms is limited (the release of the site from Green Belt is therefore not likely to give rise to significant harm). The table below provides a summary against the national functional criteria.

Purpose	Criteria	Assessment
<p>1. to check the unrestricted sprawl of large built-up areas;</p>	<p>(a) Land parcel is at the edge of one or more distinct large built up areas</p> <p>(b) Prevents the outward sprawl of a large built up area into open land, and serves as a barrier at the edge of a large built-up area in the absence of another durable boundary</p>	<p>GB51 is a relatively small site which adjoins the settlement boundary of Romford, and the developed surroundings are part of a single built-up area. Development of the land would effectively be infill as the surrounding development is part of the same settlement. GB51 is characterised by a number of urbanising features, including the A12 and surrounding housing.</p> <p>Development of site GB51 would not represent sprawl, as it is contained by existing development. Development could help to round off the settlement pattern.</p> <p>Land beyond this area to the west, which is designated as Park/Open Space as well as Green Belt, along with a strong woodland boundary, would prevent ribbon development along the A12.</p>
<p>2. to prevent neighbouring towns merging into one another;</p>	<p>Prevents development that would result in merging of or significant erosion of gap between neighbouring settlements, including ribbon development along transport corridors that link settlements.</p>	<p>The land is not between settlements and so has no role in separating neighbouring towns</p>

Purpose	Criteria	Assessment
<p>3. to assist in safeguarding the countryside from encroachment;</p>	<p>Protects the openness of the countryside and is least covered by development.</p>	<p>The countryside is afforded little protection by the designation of GB51 as Green Belt. Neighbouring land uses include, residential; road infrastructure; and recreation/parkland. This site is detached from the wider open countryside.</p>
<p>4. to preserve the setting and special character of historic towns; and</p>	<p>Protects land which provides immediate and wider context for historic settlement, including views and vistas between the settlement and the surrounding countryside.</p>	<p>Surrounding development in the form of relatively modern housing and the A12 dominate the character of the site. It has no role in preserving the setting or special character of the local townscape.</p>
<p>5. to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.</p>	<p>All Green Belt achieves this purpose if the amount of land within urban areas that could be developed has already been factored in before identifying Green Belt land.</p>	<p>The Council is already encouraging the maximum potential for urban regeneration in their policies and bearing in mind the large unmet housing need, the maintenance of this site as Green Belt is unlikely to fulfil this Green Belt purpose.</p>



**LAND NORTH OF EASTERN AVENUE
EAST,
ROMFORD, LONDON BOROUGH OF
HAVERING**

TECHNICAL NOTE

MARCH 2016



the journey is the reward

**LAND NORTH OF EASTERN AVENUE
EAST, ROMFORD, LONDON BOROUGH
OF HAVERING**

TECHNICAL NOTE

MARCH 2016

Project Code:	X/LaPOldLib.1
Prepared by:	AP
Approved by:	PZ
Issue Date:	March 2016
Status:	Final

**Land North of Eastern Avenue East
Romford, London Borough of Havering
Technical Note**

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Appendices

Plan 1: Site Location Plan

Appendix A: Opportunities and Constraints Plan

1 Introduction

- 1.1 Mayer Brown have been instructed by Old Libertians War Memorial Charitable Trust to undertake a technical review of the Old Libertians Foundation Sports Ground to outline the opportunities and constraints of this site with regards to development potential.
- 1.2 The site is located to the north of Eastern Avenue East in Romford, Greater London. Refer to **Plan 1**. The approximate grid reference for the site is E_552873, N_190730.
- 1.3 The site is bound by hedgerows and trees, with residential dwellings sited to the north and east, Eastern Avenue East to the south, and farmland located to the west.
- 1.4 The site is currently a sports ground, with buildings located in the south east corner of the site.
- 1.5 This technical note has been produced to outline the opportunities and constraints of this site and consequently the development potential. A plan has been produced which demonstrates the suitability of this site for development in light of the opportunities and constraints identified, refer to **Appendix A**.

2 Transport

Access arrangements

- 2.1** The Old Libertarians ground is currently accessed directly from Masefield Close, via a priority junction. Masefield Close is a residential cul-de-sac with a carriageway width of approximately 6m. Parking bays are marked on both sides of the road, with vehicles being permitted to park partly on the footway. This is a common arrangement in this part of London to prevent blocking of the carriageway by parked cars and will assist in ensure that clear access remains to the development site.
- 2.2** Masefield Close is currently the only access point available to the site. The junction is located on the outside of a sharp bend so has good visibility in both directions. At present, the access is around 4.0m. To enable the greatest level of development, this entrance should be widened to around 6m carriageway width plus at least one footway, to ensure that a safe and suitable access is provided for all users.
- 2.3** Other access locations have also been considered. The cul-de-sac arrangement of Ramsey Gardens adjoins the site on the eastern side. This is understood to be a private road and therefore access is unlikely to be achievable in this location.
- 2.4** The A12 Eastern Avenue runs along the south side of the site. This is a dual carriageway with a central reserve, and this particular section has limited direct access points. At an appropriate time it may be beneficial to discuss the option for a left-in left-out entrance with the highways authority, possibly with slip roads depending on speeds and volumes on the A12, in case they would be amenable to this arrangement.
- 2.5** Should the adjacent sites become available (Meadow Farm and Park Farm), so that all three sites can be developed together, there is scope to re-use the existing entrance which serves the two farms directly onto the A12. This arrangement would require upgrading to meet current design standards, but could provide a left-in left-out junction with good visibility splays, suitable for traffic from a large residential development.

- 2.6** An alternative option to access the wider sites may be to link via Keats Avenue, which forms a stub arm arrangement at present. This currently provides an access to a park, which is understood to be managed by Havering Council. Any public open space lost by providing an access through this area would need to be replaced on-site. Also, careful design in line with Manual for Streets standards would need to be given to the highway through this area, as it is likely to split an equipped play area from an open playing field and therefore slow traffic speeds and safe crossing points would be essential.

Accessibility

- 2.7** Footways are provided along the majority of local residential roads, and a network of residential roads provide cycle routes to surrounding areas. The rail stations at Gidea Park and Harold Wood are both within an easy cycling distance, via quieter roads, with off-road paths provided around the A12 grade separated junction at Gallows Corner.
- 2.8** Bus stops are available on Straight Road, approximately 500m to the east of the Masefield Close site entrance. These stops are served by route 174, between Dagenham and Harold Hill, 499 between Gallows Corner and Heath Park Estate, and the night service N86 between Harold Hill and Stratford.
- 2.9** There is a parade of local shops at the eastern end of Masefield Crescent, within 350m of the site entrance on Masefield Close including a newsagent, convenience store and pharmacy, enabling future residents to walk to this location for “top up” shopping. Additionally, there is a large supermarket approximately 1km from the site on the A12 Colchester Road, which is within walking and cycling distance.
- 2.10** Overall access to the site is achievable with accessibility and sustainability criteria meant.

3 Drainage

Flood Risk

- 3.1 The site is located in Flood Zone 1, and hence the risk of flooding from rivers and sea at the site is low. Refer to the EA Flood Map for Planning (Rivers and Sea) in **Figure 3.1**.

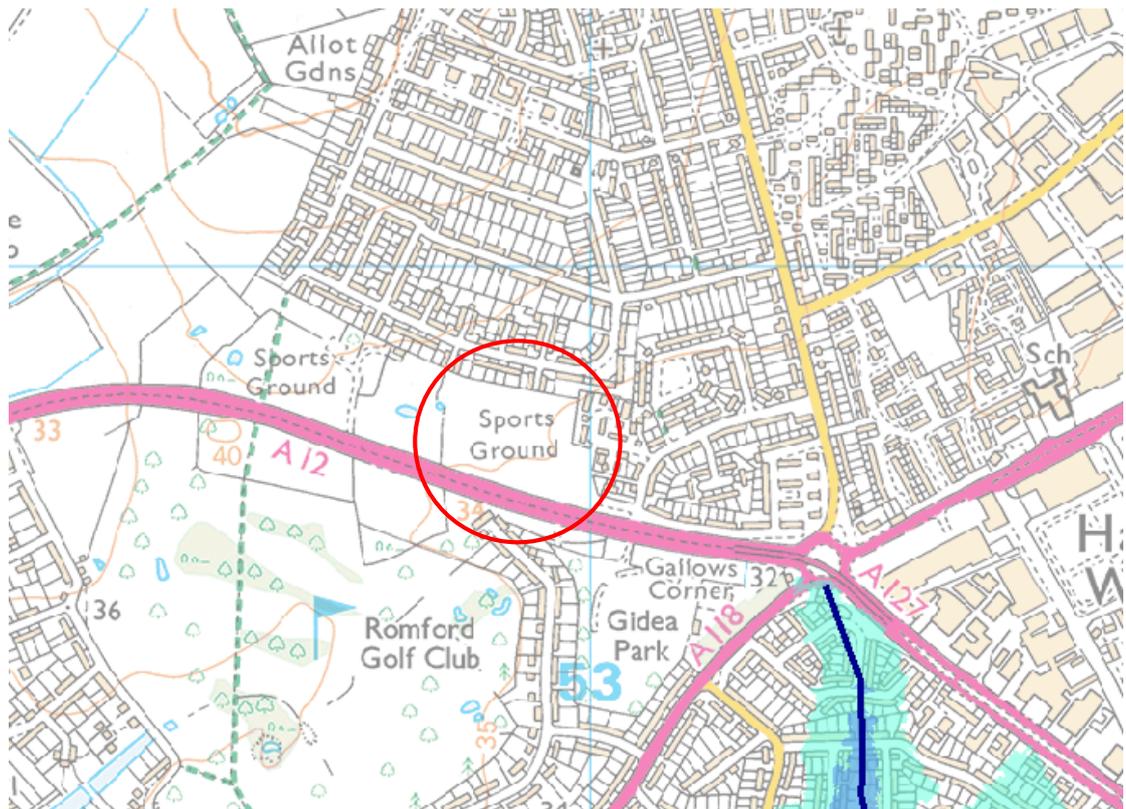


Figure 3.1. EA Flood Map for Planning (Rivers and Sea)

- 3.2 EA mapping displaying the risk of flooding from surface water indicates that the majority of the site is at a 'very low' risk of flooding from surface water, but small pockets of the site are at a 'low,' 'medium' or 'high' risk of flooding from surface water. Refer to **Figure 3.2**.
- 3.3 EA mapping indicates that there is no risk of flooding to the site from reservoirs.



Figure 3.2. EA Risk of Flooding from Surface Water

Drainage Strategy – Best Practice

- 3.4** As the proposed residential dwellings will be sited on a Greenfield site, the development will increase the impermeable area on site. As new developments should not increase flood risk elsewhere, the runoff rate from the new development site would be restricted to the Green Field Equivalent runoff rate (QBAR). To achieve this, attenuation would be provided to at least limit the runoff rate to QBAR, with an aim of reducing the runoff rate to lower than QBAR.
- 3.5** Regarding the discharge of surface water, Building Regulations Part H prescribes a hierarchal approach to surface water discharge. In order of preference, surface water should be discharged as follows:
- Via infiltration
 - To watercourse
 - To public sewer
- 3.6** The Geology of Britain viewer indicates that the site's bedrock geology is clay, silt and sand. Soakaway testing would be undertaken to determine the precise permeability of the ground and therefore the suitability of discharging via infiltration.

- 3.7 Regarding discharging surface water via a watercourse, **Figure 3.3** demonstrates that there are no watercourses within close proximity of the site.
- 3.8 If the above solutions are both deemed inappropriate, surface water can be discharged to a public sewer, subject to approval from the Regional Water Authority.

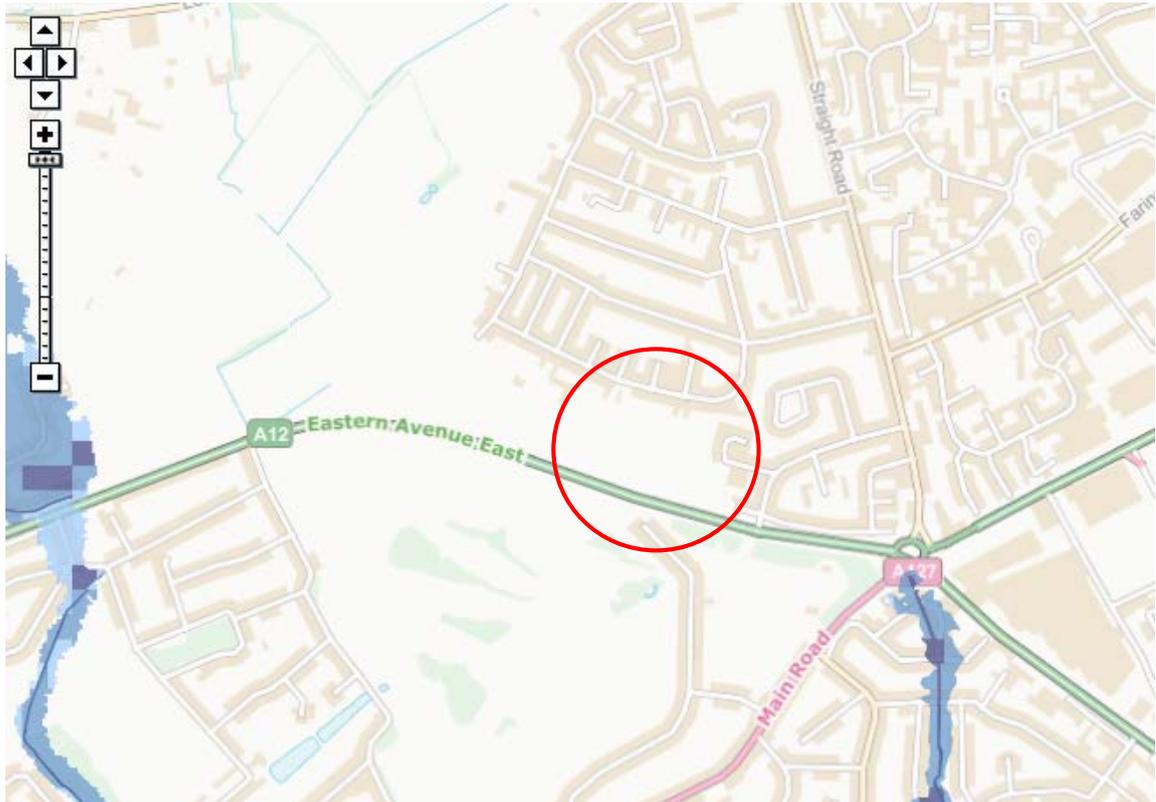


Figure 3.3. EA Risk of Flooding from Rivers and Sea

4 Ecology

Designated Wildlife Areas

- 4.1 The whole site is within metropolitan green belt; the Local Plan (Policy DC46) states that the council will promote uses in the green belt that have a positive role in fulfilling green belt objectives.
- 4.2 There are no statutory designated sites within 2 km of the site.

Site Habitats, Species and Further Assessment Required

- 4.3 The following is based on aerial photography and requires confirmation; an extended phase 1 habitat survey and data search should be undertaken to categorise the site's habitats and assess the habitats' suitability for supporting protected species.
- 4.4 The site is formed of three fields, two are fallow land and one is a sport field. All three are most likely former arable land. There are tree lines / hedgerows at most field boundaries.
- 4.5 The two fallow fields appear to be rough grassland with some light scrub. These areas could support reptiles, amphibians, breeding birds and badgers. The phase 1 habitat survey will identify badger setts and scope the need for reptile surveys (reptiles that may occur at the site are protected from harm) or bird surveys (specially protected birds are unlikely to occur here).
- 4.6 There is one pond within the site and nine within 250 m of the site; these should all be assessed for great crested newts. An initial suitability assessment will be required, followed by further surveys as appropriate. (Great crested newts are European Protected Species (EPS); the animals and their habitats are protected). Most of these ponds are on the far side of the A12, and so the impacts to newts in these ponds may be scoped out after the initial assessment. If that is the case, then only two ponds – one site pond and one pond to the west of the site may support newts which would be effected by development of the site. Direct impacts to both of these ponds can be avoided in the scheme design and appropriate compensation for newts can be achieved through creation of an enhanced wildlife area in the west of the site.

- 4.7 The site includes buildings. These should be assessed for their suitability for roosting bats (EPS), and subject to phase 2 surveys as appropriate.

Key Site Constraints and Opportunities for Enhancement

- Development should aim to achieve net gain to biodiversity in line with national policy.
- To achieve this, part of the site should include an area or areas for wildlife conservation. In particular, development massing should avoid the western part of the site, retaining this area for wildlife enhancement. This may also be needed to provide a receptor site and mitigation if reptiles or great crested newts are found to be present.
- Retain trees and hedgerows where possible.
- Include wetland planting within SUDs.
- There are two potential wildlife corridors in the existing site – a tree / hedge line that runs north – south through the middle of the site and the boundary planting along the A12; these should be retained and enhanced within a wide greenspace buffer.
- The eastern field appears to be the least ecologically significant, and there are fewer constraints to development here.

5 Landscape

Introduction

- 5.1 The site is located to the south of Bell Avenue and to the north of the A12 Eastern Avenue. To the east is the existing club house of the Old Libertians Foundation and Masefield Close. To the west is an area of open space and natural regenerating woodland.
- 5.2 The proposed site comprises of an existing sports ground bounded by semi mature trees and understorey vegetation to the north and west. The southern boundary comprises gappy trees and scrub with intermittent views into the proposed site. The eastern boundary has dwellings on Masefield Close, the club house and car park overlooking the existing sports pitches. Beyond the western site boundary are two pasture fields and a small industrial area on the northern boundary.

Landscape Character and Visual Sensitivities

- 5.3 The potential landscape and visual sensitivities are described below:
- The site is currently a sports ground so there will be a loss of local facilities and the character of the landscape will change from recreation to urban;
 - The existing landscape character is of a semi rural landscape bound by mature and semi mature trees and vegetation;
 - There will be a visual impact of the proposed development from surrounding urban grain, particularly from Bell Avenue and Masefield Close. The views will mainly be from upper storey windows only as the existing vegetation helps to screen views; and
 - The proposed development will be seen from the A12 as there are gaps in the existing vegetation along the A12 Eastern Avenue. Hedgerows and mature trees which provide visual unity and ecological connectivity.

Landscape Mitigation Guidelines

- 5.4 The following measures should be incorporated into a mitigation strategy for the proposed development:

- Conserve the veteran tree resource, promoting management of the existing resource and planting to ensure succession and habitat continuity;
- Restore hedgerow boundaries to provide visual unity and intactness and increase biodiversity, linking agricultural land with woodland. Promote growth of hedgerow trees;
- Consider opportunities for further tree (in-field) and woodland planting to reduce the visual impact of urban development;
- Provision of adequate mitigation shelter belt planting to reduce visual impact from neighbouring dwellings particularly on Masefield Close and from the A12 Eastern Avenue;
- Provision of a buffer with the existing Green Belt on the western boundary;
- Provide public open space for benefit of new community and existing urban fringe dwellings; and
- Provide ecological wildlife corridors within the site.

6 Noise

Site Constraints

- 6.1 The site adjoins the A12 (Eastern Avenue) to the south. As such, the noise climate at the site is dominated by road traffic noise:



Figure 6.1: Site Constraints - Noise

- 6.2 Whilst DEFRA noise maps do not extend fully to the site area, available data indicates that the noise levels at the southern boundary of the site are in the region of 70-75dB L_{den} . This noise levels is likely to correspond to a daytime sound level of 65-70 dB $L_{Aeq,16hour}$. The night-time noise level at the southern boundary of the site is indicated to be in the region of 60-65 dB $L_{Aeq,8hours}$.
- 6.3 Noise levels will reduce across the site (due to the natural attenuation of sound over increasing distance). The available noise maps indicate that noise levels at the northern boundary of the site may be approximately 10-15dB(A) lower than those at the southern boundary of the site, closest to the A12.

Significance of Existing Noise Levels

[BS 8233: 2014; “Sound Insulation and Noise Reduction for Buildings](#)

- 6.4 BS 8233: 2014 “Sound Insulation and Noise Reduction for Buildings” offers the following design guidance for indoor ambient noise levels within dwellings:

Activity	Location	07.00 to 23.00 hours	23.00 to 07.00 hours
Resting	Living Room	35dB L _{Aeq,16hour}	--
Dining	Dining Room/Area	40dB L _{Aeq,16hour}	--
Sleeping (daytime resting)	Bedroom	35dB L _{Aeq,16hour}	30dB L _{Aeq,8hour}

Table 6.1: BS 8233 Indoor Ambient Noise Level Design Guidance

- 6.5 Given that an open window will provide an outside to inside sound reduction of around 10-15dB(A), it is clear that, if unmitigated, existing noise levels at the site could have a significant adverse noise impact on building occupants, most particularly for any buildings site close to the southern boundary of the site.

[“Guidelines for Community Noise” \(World Health Organisation, 1999\)](#)

- 6.6 The criteria outlined in this document provide a summary of research regarding the effects of noise on the community.
- 6.7 With regard to ‘**annoyance**’, section 3.8 of the Guidelines states:

“Annoyance in populations exposed to environmental noise varies not only with the acoustical characteristics of the noise (source, exposure), but also with many non-acoustical factors of social, psychological, or economic nature. These factors include fear associated with the noise source, conviction that the noise could be reduced by third parties, individual noise sensitivity, the degree to which an individual feels able to control the noise (coping strategies) and whether the noise originates from important economic activity.”

6.8 Section 4.2.7 of the Guidelines further states that:

“The annoyance response to noise is affected by several factors, including the equivalent sound pressure level and the highest sound pressure level of the noise, the number of such events, and the time of day. Methods for combining these effects have been extensively studied. The results are not inconsistent with the simple, physically based energy equivalent energy theory, which is represented by the L_{Aeq} noise index.

.....

During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55dB; or moderately annoyed with L_{Aeq} levels below 50dB”.

6.9 It is clear that existing noise levels at the southern boundary of the site exceed WHO guideline values by a significant margin. If unmitigated, existing noise levels at the site could therefore have a significant adverse noise impact on future external amenity spaces. However, levels towards the northern boundary of the site are significantly lower and, even if unmitigated, should provide reasonable conditions for external amenity spaces.

Opportunities

6.10 The site provides a number of opportunities for mitigating the impacts of road traffic noise. Potential development strategies could include:

- The use of noise barriers running parallel to the A12 to reduce noise propagation across the site;
- Using the massing of future buildings to provide acoustic screening;
- Ensuring that future buildings offer an appropriate level of sound insulation (for example, by the specification of effective glazing/alternative means of ventilation);
- Locating amenity areas as far as practicable from the A12 and/or locating such areas to take advantage of the natural screening afforded by barriers/buildings.

6.11 With appropriate mitigation, the existing acoustic constraints of the site can be overcome to enable the site to be satisfactorily developed for future residential use.

- 6.12** In addition to the development site provided an opportunity for future sustainable residential accommodation, the development of the site would also provide benefits (i.e. reduce existing levels of traffic noise) to the existing residential area to the north of the site (Bell Avenue).

7 Ground Conditions

- 7.1 The Geology of Britain viewer indicates that the site's bedrock geology is as classified as London Clay Formation – Clay, Silt and Sand; refer to **Figure 7.1**.

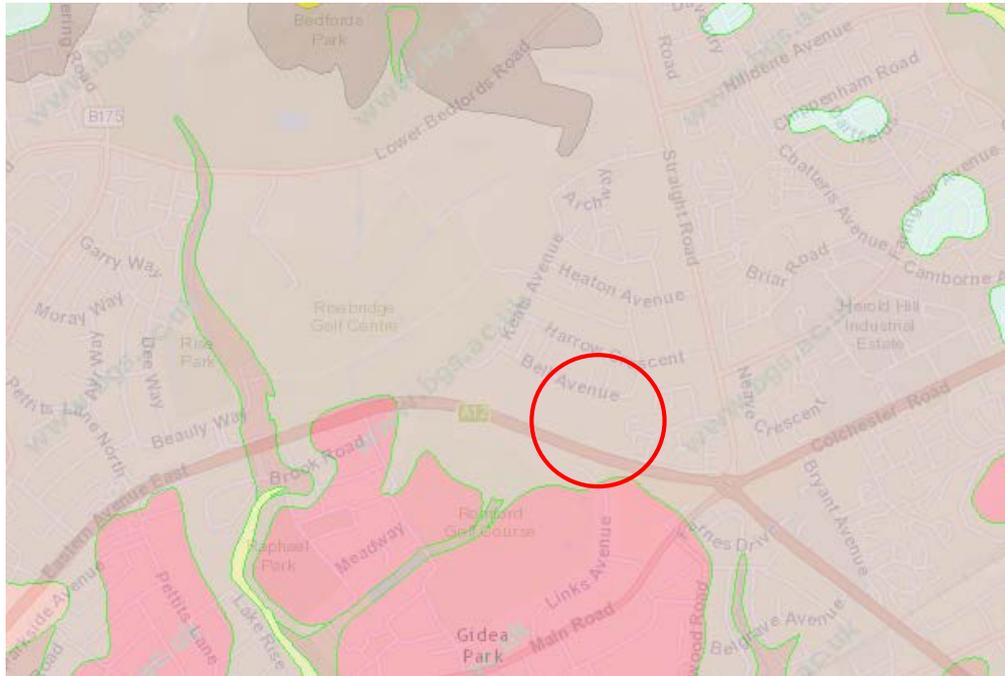


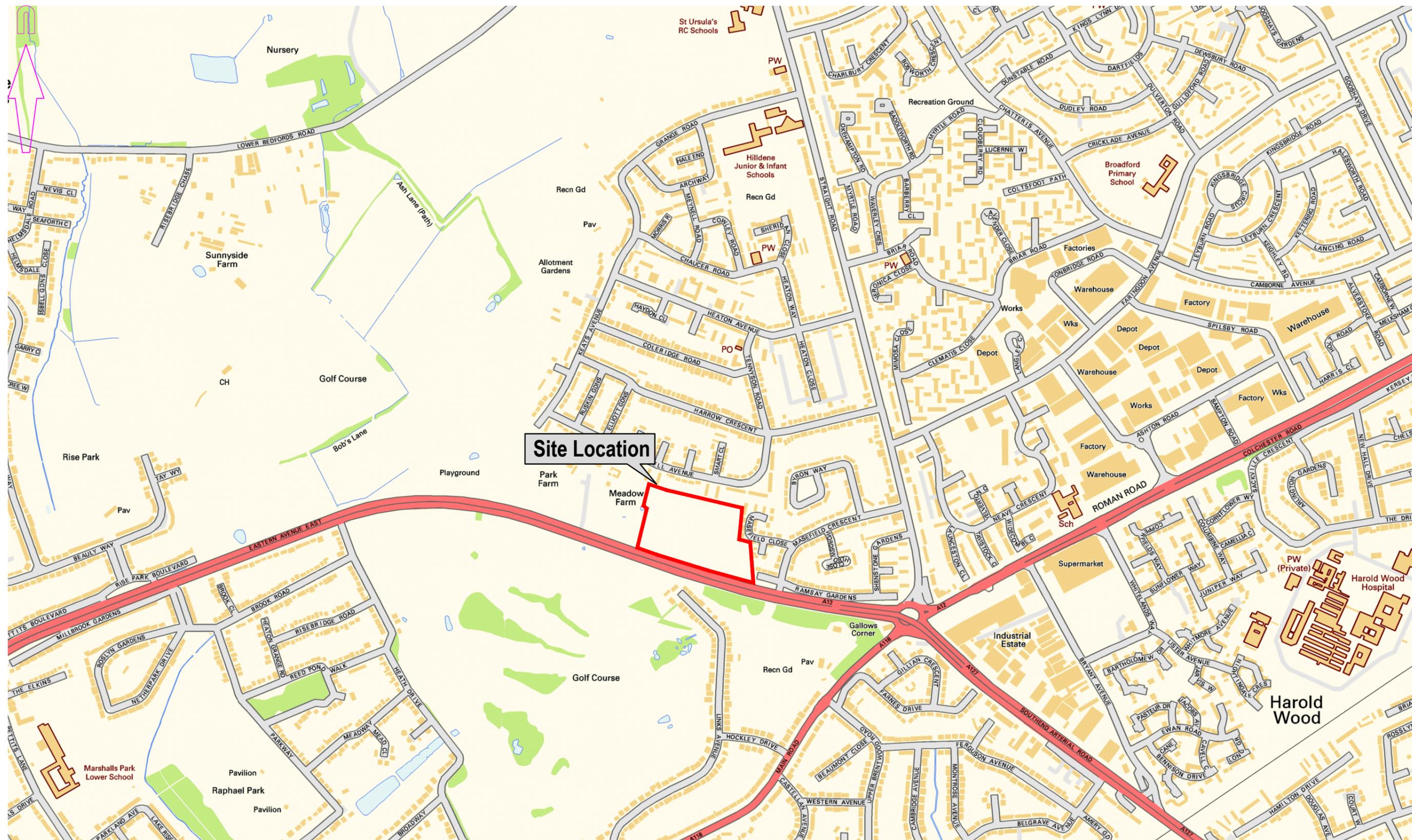
Figure 7.1. Geology of Britain viewer

- 7.2 As a result we do not expect any delivery issues with development matters. The precise permeability of the ground will be determined by soakaway testing.

8 Conclusion

- 8.1** The site is located to the north of Eastern Avenue East in Romford, Greater London. Refer to **Plan 1**. The approximate grid reference for the site is E_552873, N_190730.
- 8.2** Mayer Brown have considered the following disciplines to provide an initial view of the site and the development potential;
- Transport
 - Landscape
 - Drainage
 - Ecology
 - Ground Conditions
 - Noise
- 8.3** In overall terms the site has limited constraints and of those identified onsite offer some betterment to local residents to reduce the noise impact of the A12 as it currently exists.
- 8.4** Access is achievable via the existing access arrangement, widened to accommodate the level of development.
- 8.5** The ground conditions indicate an onsite drainage solution is practical and possible creating a platform for sensitive and responsible development without causing impact on the surrounding area, or resources.
- 8.6** As a result we believe this site is worthy of consideration for development.

Plan 1: Site Location Plan



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client
Land and Partners Ltd.

project
Romford, Havering

title
Plan 1 - Site Location Plan

scale	N. T. S.	drawn by	LP	checked by	AP
date	MARCH 2016	cad file	Site Location Plan.dwg		
drawing number	X/LaPOldLib.1/01			rev.	

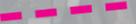
Appendix A: Opportunities and Constraints Plan

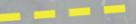
Private Road Preventing Access 

Existing Buildings 

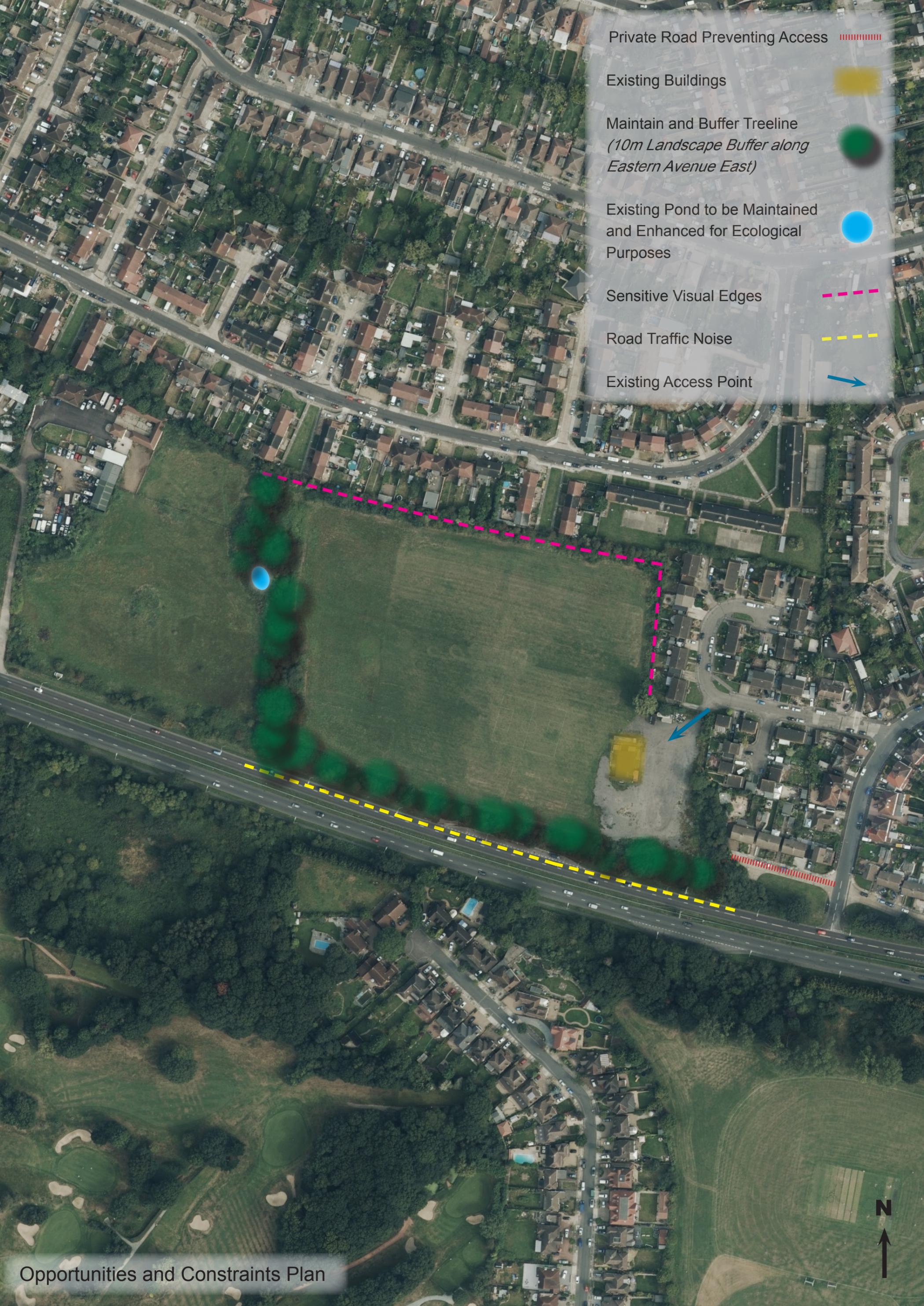
Maintain and Buffer Treeline
*(10m Landscape Buffer along
Eastern Avenue East)* 

Existing Pond to be Maintained
and Enhanced for Ecological
Purposes 

Sensitive Visual Edges 

Road Traffic Noise 

Existing Access Point 





**APPRAISAL OF SITE SUITABLE AND
AVAILABLE FOR RESIDENTIAL
DEVELOPMENT**

**OAK ROYAL NURSERIES 355A FRONT
LANE**

UPMINSTER ESSEX RM14 1LW

SHLAA SITE ANALYSIS

This appraisal has been prepared by Cris Lancaster BATp MSc MRTPI. Cris Lancaster is a chartered town planner with over thirty years experience of planning including site promotion, research, submission and negotiation of applications, providing expert evidence at public inquiries, informal hearings and written representations.

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INTRODUCTION

The purpose of this document is to advance the merits of this site for inclusion as a suitable, available and sustainable housing site to assist the Council in maintaining a rolling programme of housing land.

The site is in single ownership meaning that there are no problems of site assembly.

SITE LOCATION AND DESCRIPTION

The site is located on the edge of the Upminster settlement area on the western side of Front Lane. It lies south of Junction 29 of the M25 motorway and the A127 Arterial Road.

It has an area of approximately 0.4 ha. It is currently in nursery use. There are a group of buildings to the south east corner. Access is between Nos. 355 and 357 Front Lane. No. 355 is a two storey semi-detached house. No. 357 is a single storey bungalow. The access is narrow and is restricted by a weeping willow and a mature hedge.

The site is bounded to the east and south and partly to the north by residential development. To the west is open land and mature woodland (Pot Kiln Wood)

There is a power line crossing the southern section of the site, with a large pylon located just to the west.

This part of Upminster is a mature residential area of mixed character. Front Lane is a busy road which includes bus routes. There is a local shopping area some 300 metres to the south at the junction with Avon Road.

PLANNING POLICY

Planning policy comprises three levels, National, Strategic and Local.

National Planning Policy Framework (March 2012)

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities

The NPPF seeks to proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth. Plans should take account of market signals, such as land prices and housing affordability, and set out a clear strategy for allocating sufficient land which is suitable for development in their area, taking account of the needs of the residential and business

The NPPF recognises that residential development can play an important role in ensuring the vitality of centres and set out policies to encourage residential development on appropriate sites.

The NPPF states that local planning authorities should identify and bring back into residential use empty housing and buildings in line with local housing and empty homes strategies and, where appropriate, acquire properties under compulsory purchase powers. They should normally approve planning applications for change to residential use and any associated development from commercial buildings (currently in the B use classes) where there is an identified need for additional housing in that area, provided that there are not strong economic reasons why such development would be inappropriate.

To boost significantly the supply of housing, local planning authorities should:

- use their evidence base to ensure that their Local Plan meets the full, objectively assessed needs for market and affordable housing in the housing market area, as far as is consistent with the policies set out in the Framework, including identifying key sites which are critical to the delivery of the housing strategy over the plan period;
- identify and update annually a supply of specific deliverable sites sufficient to provide five years worth of housing against their housing requirements with an additional buffer of 5% (moved forward from later in the plan period) to ensure choice and competition in the market for land. Where there has been a record of persistent under delivery of housing, local planning authorities should increase the buffer to 20% (moved forward from later in the plan period) to provide a realistic prospect of achieving the planned supply and to ensure choice and competition in the market for land;
- identify a supply of specific, developable sites or broad locations for growth, for years 6-10 and, where possible, for years 11-15;
- for market and affordable housing, illustrate the expected rate of housing delivery through a housing trajectory for the plan period and set out a housing implementation strategy for the full range of housing describing how they will maintain delivery of a five-year supply of housing land to meet their housing target; and;
- set out their own approach to housing density to reflect local circumstances.

Housing applications should be considered in the context of the presumption in favour of sustainable development. Relevant policies for the supply of housing should not be considered up-to-date if the local planning authority cannot demonstrate a five-year supply

of deliverable housing sites. Local planning authorities should seek opportunities to achieve each of the economic, social and environmental dimensions of sustainable development, and net gains across all three

The NPPF encourages the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. Appendix 2 of the NPPF provides a definition of 'Previously developed land'

Previously developed land: Land which is or was occupied by a permanent structure, including the curtilage of the developed land (although it should not be assumed that the whole of the curtilage should be developed) and any associated fixed surface infrastructure. This excludes: land that is or has been occupied by agricultural or forestry buildings; land that has been developed for minerals extraction or waste disposal by landfill purposes where provision for restoration has been made through development control procedures; land in built-up areas such as private residential gardens, parks, recreation grounds and allotments; and land that was previously-developed but where the remains of the permanent structure or fixed surface structure have blended into the landscape in the process of time.

The NPPF emphasises that the Government attaches great importance to Green Belts. The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence.

The site does not fall within the definition of 'previously developed land'. It would therefore be considered as a 'greenfield' site for the purposes of determination of a planning application.

The London Plan

Greater London is administered by the Greater London Authority, which is the strategic authority for the area under the control of the Mayor of London.

The following policies of the Greater London Plan are particularly relevant to the site:

Policies 3.3 (increasing housing supply), 3.8 (housing choice), 7.6 (architecture), 7.16 (green belt) of the 2011 London Plan are relevant.

The Plan makes it clear that the strongest protection should be given to London's Green Belt, in accordance with national guidance. Inappropriate development should be refused, except in very special circumstances. Development will be supported if it is appropriate and helps secure the objectives of improving the Green Belt as set out in national guidance

Core Strategy and Development Control Policy Development Plan Document

The site is within the area administered by the London Borough of Havering

Policies DC2 (Housing Mix and Density), DC3 (Housing Design and Layout), DC33 (Car Parking), DC36 (Servicing), DC45 (Appropriate Development in the Green Belt), DC61 (Urban Design) of the LDF Core Strategy and Development Control Policies DPD are considered relevant. The Adopted Residential Design SPD is also relevant.

The site is situated within the Metropolitan Green Belt where development is restricted in order to restrict the sprawl of urban settlements, safeguard the countryside from encroachment and preserve the setting and character of historic towns. The settlement area boundary runs just to the south of the site



GREEN BELT BOUNDARY

HOUSING LAND SUPPLY

London Borough of Havering’s target is 4,850 units for the period 2012/13 to 2016/17. The current projected supply is 5,307 units. On this basis, the Council will meet be able to deliver a five year housing land supply. However, this is a rolling programme and the Council should continue to invite owners to advance sites that are genuinely available and suitable for residential development.

SITE SPECIFIC CONSIDERATIONS

Any intensification of development is likely to require upgrading of the access. It is considered that this is achievable on land within the control of the owners of the site.



POWER LINE

The proximity of a power line is noted. The National Grid has produced guidelines for development near power lines. It has sometimes been suggested that minimum distances between properties and overhead lines should be prescribed. National Grid does not consider this appropriate since each instance must be dealt with on its merits. However, it has always sought to route new lines away from residential property on grounds of general amenity. Since the only limitation on new development has been the statutory safety clearances, a large amount of residential and other development has been carried out subsequently beneath and adjacent to overhead lines.

Where development takes place and how it is designed are principally matters for the landowner, developer and the local planning authority to determine. National Grid should be consulted at an early stage on proposals for development near lines and substations, when it is more likely that National Grid's advice and guidance on development near to electricity lines issues can be taken into account

SHLAA SITE ANALYSIS



INFRASTRUCTURE CONTRIBUTIONS

The London Borough of Havering has adopted a Supplementary Planning Document (SPD) setting out the requirements for infrastructure contributions payable by development. In the case of residential development this is £6,000 per dwelling. In addition a payment of £20 per square metre (net internal) is made through Community Infrastructure Levy adopted by the Mayor of London. This is to assist in the funding of Crossrail. It is appreciated that this position may have changed by the time an application is submitted but the owner accepts that, in principle, this form of contribution is an acceptable and reasonable requirement to allow the public authorities to absorb the wider impacts of development on the local and strategic environment.

WILDLIFE AND NATURE CONSERVATION

The site has been extensively worked as a nursery and it is unlikely that any wildlife or nature conservation interests will be affected by redevelopment. It is accepted, however, that an ecological report would be appropriate in the event of an application for redevelopment being submitted.

SITE ANALYSIS

OTHER USES OF THE LAND

Planning policy does allow re-use of existing buildings in the Green Belt and it is recognised that re-use often represents the most sustainable form of development. There are no buildings suitable for conversion to residential use and it is considered that in order to achieve a comprehensive scheme redevelopment offers the most appropriate option.

SUITABILITY OF THE SITE FOR RESIDENTIAL REDEVELOPMENT

There is no doubt that the site is well-located for facilities and public transport and, in this sense, it is 'sustainable'. However, sustainable development comprises three elements – economic, environmental and social. It is recognised that an application is currently likely to fail on the environmental consideration of protection of the Green Belt. Residential development is 'inappropriate'. Conversely, the existing use is 'appropriate'.

However, it adjoins an existing residential area and offers an obvious opportunity for an extension of residential development on land which is already intensively developed and available.

It is well-served by public transport and is a short distance from local services and facilities.

CONCLUSION

The site is genuinely available and is in a single ownership. The site is highly sustainable being located on a bus route and close to services and facilities. It offers a natural extension of the existing residential area. A development can be advanced which respects the character and design of existing local housing. Detailed design could achieve a scheme which would offer a suitable transition between the existing housing development and the countryside. This could, if appropriate, include green links to the countryside which would be of benefit both to the local population and to wildlife.

It is trusted that the Council will give careful consideration to identification of this site as a suitable housing site to assist in meeting its commitment to achieve a balanced community.

SHLAA SITE ANALYSIS

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01245 201226
Our Ref: 0696/AR
Date: 13th October 2015

Dear Sir/Madam,

Land at Tomkyns Manor, Tomkyns Lane, Upminster, RM14 1TP

The following comments are in support for the release of land at Tomkyns Manor from the Green Belt. I understand that this land has already been submitted for consideration, so please accept this letter as additional evidence in support of this site.

The landowner has submitted this land as four separate sites:

- Site 1 – the site has an existing barn that is currently used as a stables. It is the landowners intention to convert this existing barn into residential accommodation.
- Site 2 – a site of approximately 10 acres (4ha), but given the characteristics of the area would be suitable for a scheme of 10-12 dwellings. This site would be suitable for a specific self-build allocation.
- Site 3 – a site of approximately 6 acres (2.4ha), but given the characteristics of the area would be suitable for a scheme of 6-8 dwellings. This site would also be suitable for a specific self-build allocation.
- Site 4 – a site of approximately 4 acres (1.6ha), but given the characteristics of the area would be suitable for a scheme of 4-6 dwellings. This site would also be suitable for a specific self-build allocation.

Green Belt

The four sites at Tomkyns Manor are all located on land designated as Green Belt.

Paragraph 79 of the NPPF states that the fundamental aim of Green Belt policy is to prevent urban sprawl and to maintain their openness and their permanence. Paragraph 83 states that Green Belt boundaries should only be altered in exceptional circumstances. It is anticipated that the Council will have to release land within the Green Belt to meet the objectively assessed need for the Borough and wider housing market area, which would amount to an exceptional circumstance. This need will be set out in the emerging Strategic Housing market Area.

The sites at Tomkyns Manor are collectively enclosed with no degree of existing openness and in this respect these sites do not fulfil the requirements of the NPPF. The eastern and western boundaries of the wider site are characterised by mature landscaping which prevent views across the site. The eastern and western boundary of the site contains a mature thick tree belt that also provides a defensible Green Belt boundary. The land to the south of the site is enclosed by mature trees and landscaping in the surrounding area. The only views of the site from the surrounding area are from Tomykins Lane, however the thick mature boundary prevents views into the site.

Paragraph 80 of the NPPF states that the Green Belt serves five purposes:

- to check the unrestricted sprawl of large built-up areas;
- to prevent neighbouring towns merging into one another;
- to assist in safeguarding the countryside from encroachment;
- to preserve the setting and special character of historic towns; and
- to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

As will be explained below, neither of the sites at Tomykins Manor, fulfils the purposes of the Green Belt.

Unrestricted Sprawl

With regard to the aim to protected unrestricted sprawl, the site is located towards the eastern edge of the built-up area and is located in a semi-urban area that is characterised by a scattering of large residential dwellings. Tomkyns Lane and the mature landscaping on the eastern boundary of the wider site acts as a barrier physically and visually separates the site from the surrounding area. It is considered that the containment of the site by the mature landscaping along the boundary edges

represents an important characteristic that ensures that development of the site would not represent unrestricted urban sprawl.

In defining Green Belt boundaries, Paragraph 85 of the NPPF states that local planning authorities should define boundaries clearly, using physical features that are readily recognisable and likely to be permanent and could include roads and tree lines. It is considered that the mature landscaping would act as a robust and defensible boundary to the Green Belt.

The enclosed nature of this site ensures that its development would not represent unrestricted urban sprawl and the containment of the site is an important characteristic.

Coalescence

The second purpose of the Green Belt is to prevent neighbouring towns from merging into one another. With regard to the second purpose, development of the site would only marginally bring the built up area of Romford closer to Brentwood, which at its closest point is over 2 miles to the east. The proposed development would therefore only be located marginally closer to this settlement. Furthermore, the mature landscaping along the applications eastern boundary, together with a number of physical boundaries, such as the M25 motorway and various significantly wooded areas would prevent Romford and Brentwood from ever merging.

Development these sites would not result or contribute towards Romford and Brentwood merging into each other.

Safeguarding the Countryside

The third purpose of the Green Belt seeks to assist in safeguarding the countryside from encroachment. The wider site is largely separated from the rest of the countryside by the mature landscape boundaries on all sides.

The Setting and Special Character of Historic Towns

Point 4 requires the preservation of the setting and special character of historic towns. The historic core of Romford is centred along South Street in the town centre. Historically, Romford has developed by building on open land to the north and east of the town centre, such that the original historic core is surrounded by more modern development. In these circumstances, the site does not perform a function in preserving the setting of the historic centre of Romford.

Urban Regeneration

Point 5 states that the Green Belt is required to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. There are a lack of development opportunities within the wider built-up area of Havering to meet the objectively assessed need for the borough and wider housing market area. Consequently the tightly drawn Green Belt boundary restricts housing delivery and results in the housing objectives of the London Plan not being met.

Development at the Tomkyn Manor sites would therefore not impact upon the regeneration of urban sites, but it would positively contribute to meeting the Council's wider housing objectives.

Self-Build Development

The landowner has indicated that he would be willing to put these sites forward as specific self-build allocations.

Over recent years, the Government has expressed strong support for custom and self-build schemes through a comprehensive legislative framework. Self-build housing is now embedded into national planning policy. Paragraph 50 of the NPPF states:

"To deliver a wide choice of high quality homes, widen opportunities for home ownership and create sustainable, inclusive and mixed communities, local planning authorities should: - plan for a mix of housing based on current and future demographic trends, market trends and the needs of different groups in the community (such as, but not limited to, families with children, older people, people with disabilities, service families and people wishing to build their own homes) [our emphasis]"

In March 2015, Planning Minister Brandon Lewis wrote to local authorities to stress the government's pledge to make custom home building simpler and more affordable, stating:

The government has a vision to increase diversity in the housing market; custom and self-build homes can play a crucial role as part of a wider package of measures to achieve this goal.

Furthermore, the Planning Minister stressed a warning to local authorities who do not help promote this new form of house building, noting:

National planning policy and guidance is clear that local planning authorities should identify and plan for local demand for custom and self-build housing. Planning inspectors will want to see evidence that consideration of demand for custom and self-build housing has been taken into account when they examine local plans. Failure to provide sufficient evidence may lead to plans being found unsound.

The Self-Build and Custom House Build Act 2015, now places a duty on all authorities to keep a register on individuals and community groups interested in building their own homes. Furthermore, councils will need to take into account this self-build need in their local plan making and show this demand in their SHMA report.

At present, the Council does not have any self-build policies or initiatives and does not appear to have set up its self-build register as required by the Self-Build and Custom House Build Act 2015.

In light of this, the sites at Tomkyns Manor would provide an important location to meet this self-build need that would not be possible in an established urban area given the lack of suitable self-build sites.

I trust that the comments made above will be considered alongside the submissions that have already been submitted in support of the sites at Tomkyns Manor. Should you have any further questions please feel free to contact me directly.

Yours faithfully,



Andrew Ransome

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24th August 2016

By Email and by Post

Dear Lukas,

Havering Local Plan – Call for Sites Land west of Lodge Lane, Romford

Further to our recent discussions I write to formally submit details of our Client's land holding at Lodge Lane, Romford for consideration as part of the emerging Local Plan. Strutt & Parker are acting on behalf of Scott Properties with regards to the site.

As we discussed I understand that work on the emerging Local Plan and evidence base is progressing. I have therefore provided below details of the site and emerging proposals. I would request that these are please considered as work on the Local Plan progresses.

The site at Lodge Lane covers a total area of approximately 7ha. The site is split by an existing area of raised land and it is proposed that this is maintained to form a buffer between the proposed area of development and the portion of the land which will be provided as public open space. This site division is also in line with the existing limit of built development on the site of the adjacent Forest Row Centre and Litten Close south of this. The overall area proposed for development to accommodate the care village covers an area of approximately 3.9ha.

The site benefits from good connectivity with the existing community. Buses also run from outside the site, approximately every 10 minutes between Havering Park and Harold Hill, calling at Romford, Gidea Park and Harold Wood stations. These provide access to both National Rail and London Underground services in and out of Central London and other nearby centres. As well as the local facilities provided along Colliers Row which are approximately 0.5 miles from the site, Romford is approximately 2.5 miles away and offers a wide range of larger scale services and facilities. Access to the site is available from Abridge Gardens and Portmore Gardens, from Lodge Lane.

It is proposed that the site provides for a high quality retirement community to meet housing needs and in particular assist in meeting the needs of the ageing population. The nature of the proposal will of course generate only limited traffic and is anticipated to provide in excess of 120 jobs. The proposal will therefore have very significant benefits in terms of the social and economic aspects of sustainable development. Additionally the land to the west of the site, is proposed to be retained as open space and provides opportunities for environmental enhancement.

Background

As you will be aware the NPPF highlights the need for the planning system to support *“strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being”*.

The framework promotes healthy communities and seeks to *“deliver a wide choice of quality homes, widen opportunity for home ownership and create sustainable, inclusive and mixed communities”* by planning of a *“mix of housing based on current and future demographic trends, market trends and the need of different groups in the community”* such as older people. Older people are defined within the NPPF as *“people over retirement age, including the active, newly-retired through to the very frail elderly, whose housing needs can encompass accessible, adaptable general needs housing for those looking to downsize from family housing and the full range of retirement and specialised housing for those with support or care needs”*.

In relation to health and social care facilities, Policy 3.17 of the adopted London Plan sets out that the Mayor will support the provision of high quality health and social care appropriate for a growing and changing population, particularly in areas of under provision or where there are particular needs. Policy 3.17 sets out that development proposals, which provide high quality health and social care facilities will be supported in areas of identified need, particularly in places easily accessible by public transport, cycling and walking.

There is a recognised need for housing to support the needs of older people within Havering. The London Strategic Housing Market Assessment (2013) which notes at 3.58 that the projected 2036 population has a much older average age, which has a very large effect on projected household growth. The SHMA notes that: *“Using the same set of household representative rates (DCLG rates extended to 2036), the projected 2036 population (the red line) would result in 4.27 million households, while the same number of people distributed according to the 2011 age distribution (the green line) would result in 3.96 million households.”*

It will therefore be important for the new Havering Local Plan to ensuring homes provided in borough meet the needs of the future ageing population and in this context opportunities such as that provided by the site at Lodge Lane are particularly relevant.

The proposed care village is strongly supported by Policy 3.17 of the adopted London Plan and the acute need for this facility is considered to provide very special circumstances for the release of this land from the Green Belt.

Retirement Community

The proposed development will comprise a retirement community which will offer three types of accommodation:

- Care Bedrooms – located in the Care Centre at the heart of the community and are suited to the person dependant on a 24/7 level of care;
- Serviced Care Suites – offer a greater degree of privacy and independence than a Care Bedroom, whilst still providing the client with the necessary level of care as required; and
- Close Care Apartments/Cottages – offer an independent lifestyle and are designed to make life as easy and enjoyable for the client as possible. These units are more suited to a more physically able couple where one partner may need some assistance with daily activities.

In addition to the care units, a complex (main house) will be provided centrally within the site that will contain a number of facilities to serve the proposed care units. These facilities will likely include a dining area, bar, lounge, library, spa and hydrotherapy pool, hobbies room, care services, staff and service. These facilities will not only be offered to the future residents of the retirement community, but also to the wider community, thereby allowing the development to integrate into the local area in a cohesive manner.

The community will also have the ability to cater for a variety of specialist care requirements. These include, but are not limited to:

- Dementia care;
- Palliative care;
- Respite care – offers care givers short term breaks. It helps care givers (including families) to reenergize, reduce stress and address personal needs that may have become neglected because of care responsibilities; and
- Convalescent care – offers care to people that are recovering from an illness or operation, taking strain away from the NHS.

It is envisaged that the village will be able to offer variable levels of care to meet a range of needs. This will support the generation of an inclusive community and maximise the benefits that the village will be able to provide to the wider area.

Many traditional retirement housing operators offer few advantages and benefits to older people over staying in their existing homes and are closely associated with residential housing falling under Use Class C3. A care village provides an environment which still forms part of the wider community but offers a distinguished new environment with clear cut benefits. It is intended that this will make leaving existing homes a feasible consideration and ensure that people are in the best environment to suit their needs.

Research - Continuing Care Retirement Community

Aston University published results of a study on a Midlands based Continuing Care Retirement Community (CCRC), comparing and contrasting the health outcomes of a group of 195 residents who elected to move into the development against a group who elected to stay in their existing homes. The results were dramatic on a number of levels. Key findings of the research included:

- NHS costs for the CCRC residents were cut by 38 per cent over 12 months compared with their costs when they first moved in;
- The CCRC residents experienced a significant reduction in the duration of unplanned hospital stays from 8-14 days to 1-2 days;
- Routine GP appointments for the CCRC residents fell 46 per cent after a year;
- Numbers of people with clinical levels of depression fell by 64.3 per cent over 18 months;
- Measures of depression symptoms were reduced by 14.8 per cent after 18 months for new CCRC residents and those with low mobility showed the greatest improvement in this 'mood measure';
- The cost of providing higher level social care was £4,556 (26 per cent) less per person, per year than providing the same level of care in the local community; and
- In-depth, 'autobiographical' memory improved by 10.1 per cent for the CCRC residents after 18 months.

Research – The International Longevity Centre – The state of the Nation's housing

The key points from the report relating to the need for elderly housing are summarized below:

- The population ageing is leading to rising care needs, but these care needs are not being met. In 2012/13 there were 1.86 million people over the age of 50 in England who had unmet needs - an increase of 120,000 people (or 7%) since 2006/7. This means that around 1 in 10 people aged over 50 in England has an unmet care need;
- The rate of construction of new housing for older people has varied over the years. It peaked in 1989 at 30,000 units but has since fallen back dramatically - averaging around 7,000 new units a year over the last decade;
- There are around 515,000 specialist retirement and extra care homes in England. However, this means that there is only enough specialist housing to accommodate 5% of the over-65 population;
- According to our calculations, there could be a retirement housing gap of 160,000 retirement housing by 2030 if current trends continue. By 2050, the gap could grow to 376,000; and
- Nearly 9 in 10 of the 65-79 age group live in under-occupied housing - over 50% live in homes with two or more excess bedrooms.

Sustainable transport

A care village will generate 25% of the traffic movements of a residential development of an equivalent scale, due to the majority of residents using the transport facilities provided by the care village (minibus and fleet cars), or also in this case the easily accessible public transport options.

Exceptional design

As part of a development integrating successfully into its setting, design is key. The Care Village model focuses on exceptional design, with each development being bespoke responding to the local design features through the use of materials, and paying close attention to the existing built environment.

The double housing benefit

The new Care Village being proposed will provide a range of care accommodation to meet the needs of up to 300 older people requiring care and support. This will contribute towards alleviating the chronic shortage of elderly care facilities in the Epping Forest District along with freeing up larger, under occupied, family homes; a double benefit.

The local economy

A new care facility would not only provide full and part time employment opportunities for nursing care and administrative staff, but also cooks, waiters, gardeners, lecturers, hairdressers, event organisers and office staff. It is hoped that as many people as possible will come from the local community. The proposals are anticipated to provide in excess of 120 jobs.

Along with the economic benefits associated with the construction phase of the project, there will be significant benefits felt by the local economy through the additional spend from residents, employees and visitors to the care village.

Conclusion

The subject site presents a rare opportunity to utilise land which does not currently contribute significantly to the green belt or the surrounding built environment for a specialist use, which will not only help towards meeting the immediate chronic shortage of care and elderly accommodation, but also contribute positively to the local economy moving forward.

Both my clients and myself would be more than happy to meet with you and discuss the Care Village model in more detail. A Vision Document will be submitted in the near future, that will be informed by a number of technical reports; the purpose of this document will be to demonstrate a higher level of deliverability.

Should you require any other information at this stage please do not hesitate to contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J Firth'.

James Firth BA(Hons) MSc MRTPI
Associate Partner

Enc Site location plan – wider context
Site red line plan
Proposed development area plan

cc Martyn Thomas, Development Planning, London Borough of Havering
Rob Scott, Scott Properties

PREPARED BY



For



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Land at South of Lower Bedfords Road East Reservoir Romford



Our Reference: J002131/SF/J - April 2017



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1.0 INTRODUCTION

1.1 WS Planning & Architecture have been instructed by Jardin Smith International to prepare a document to support the submission of the site, land at Upper Bedfords Farm, Romford, Essex, in regards to the Councils call for sites.

1.2 The purpose of this report is to promote the site for development, in doing so the report will assess the:

- Relevant History
- The Site Details
- Development Management Constraints
- Heritage Constraints
- Infrastructure Constraints
- Site Access
- Environmental Constraints
- Other Constraints
- Development Potential.

2.0 RELEVANT HISTORY

- 2.1 In June 2015, WS Planning & Architecture submitted an application to the Council under the Towns and Country Planning (Environmental Impact Assessment) Regulation 2011, for a mixed use development comprising residential of 50+ dwellings, community uses and open spaces. No formal response would appear to have been received.
- 2.2 The site has also been actively promoted through the “call for sites” consultation carried out by the Greater London Authority in January 2013.
- 2.3 In addition, in July 2014 WS Planning & Architecture undertook an in-house Housing Needs Assessment for the London Borough of Havering. The purpose of this report was to provide background evidence in support of any planning application as at that time the Council had not produced any up to date evidence on the objectively assessed housing needs for the district.

3.0 SITE

- 3.1 The site is located on the south of Lower Bedford Road within the Green Belt area of Romford. The site comprises a large parcel of land (10.45 hectares) which was formerly part of Upper Bedford Farm before being sold to in 2010.
- 3.2 The site is abutted by housing to the south and on the edge of the urban area of Harold Hill. To the south of Harold Hill is the A12, to the east the M25 motorway.
- 3.3 A school lies to the southeast of the site together with an area of land designated as Borough Site of Special Scientific Interest. Access can be gained via Lower Bedford Road and there is an access to the land from Grange Road at the southern end of the site.
- 3.4 There are bus stops located in Straight Road next to St Ursula's School and in Grange Road all within easy walking distance which provide a regular service to Noak Hill Dagnam Park Square and Gallows Corner.



Site photographs



1 - Sight line East from existing access on Grange Road



2 - Access to site from Grange Road

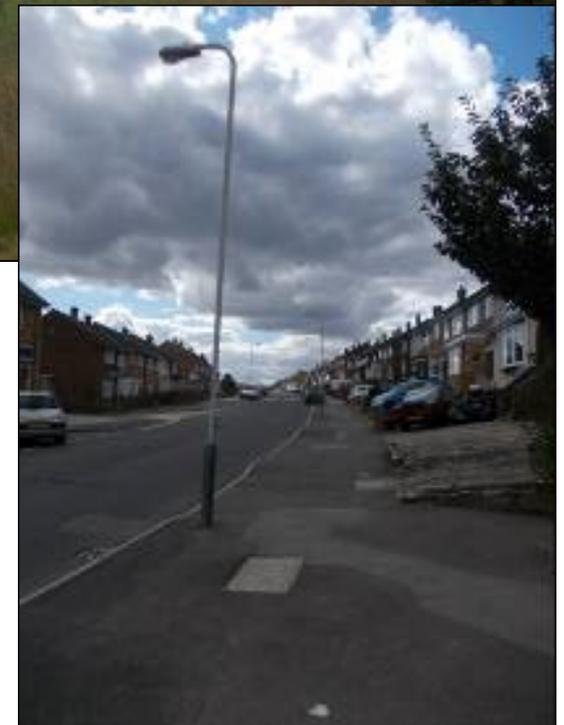


3 - Entrance to site from Grange Road



4 - Row of retail opposite site along Grange Road

5 - Panoramic view from Lower Bedfords Road access



6 - View West along Grange Road

Site constraints Assessment

3.5 - Site details	
Site address:	Land at South of Lower Bedfords Road, East Reservoir, Romford.
Site area:	10.45 hectares
How much of the site is suitable for development:	10.45 hectares
Is the site occupied or vacant:	Vacant
Existing use:	Grazing land
Is the site leased:	No
When could the site be made available for development:	Within 5 years
Are there any buildings on the site:	No

3.6 - Development Management Constraints
The site is constrained by its Green Belt designation. There are no other constraints.

3.7 - Heritage Constraints	
Conservation Area	No
Listed Buildings	Not within the site – Upper Bedfords Farmhouse is a Grade 2 listed building located to the north of the site. (See figure 1)
Special Character Area	No
Archaeological Interest	Not known

3.8 - Infrastructure constraints	
Bus stops	The site is within easy walking distance to several bus stops. Located in Straight Road and in Grange Road all of which provide a regular service to Noak Hill Dagnam Park Square and Gallows Corner. (See figure 2)
Railway Stations	The nearest stations are Harold Wood and Gidea Parkv which are approximately 3.35Km and 3.84km respectively . (See Figure 3)
Shops	Yes—various shops
Schools	Yes - St Ursula's infant and Junior schools, Hilldene Primary School.
Community facilities	Yes - various community facilities in the area.

Figure 1 -
Upper Bedfords
Farmhouse —
Grade ii listed
building.



Figure 2 - Bus Stops

<p>Grange Road Archway Bus and Coach Station</p> 
<p>Hilldene Primary School 5.0 ★★★★★ (1) Bus and Coach Station</p> 
<p>St Ursula's School 5.0 ★★★★★ (1) Bus and Coach Station</p> 
<p>Hilldene Primary School (Stop) Bus and Coach Station</p> 
<p>Grange Road Harold Hill Bus and Coach Station</p> 
<p>St Ursula's School 5.0 ★★★★★ (1) Bus and Coach Station</p> 

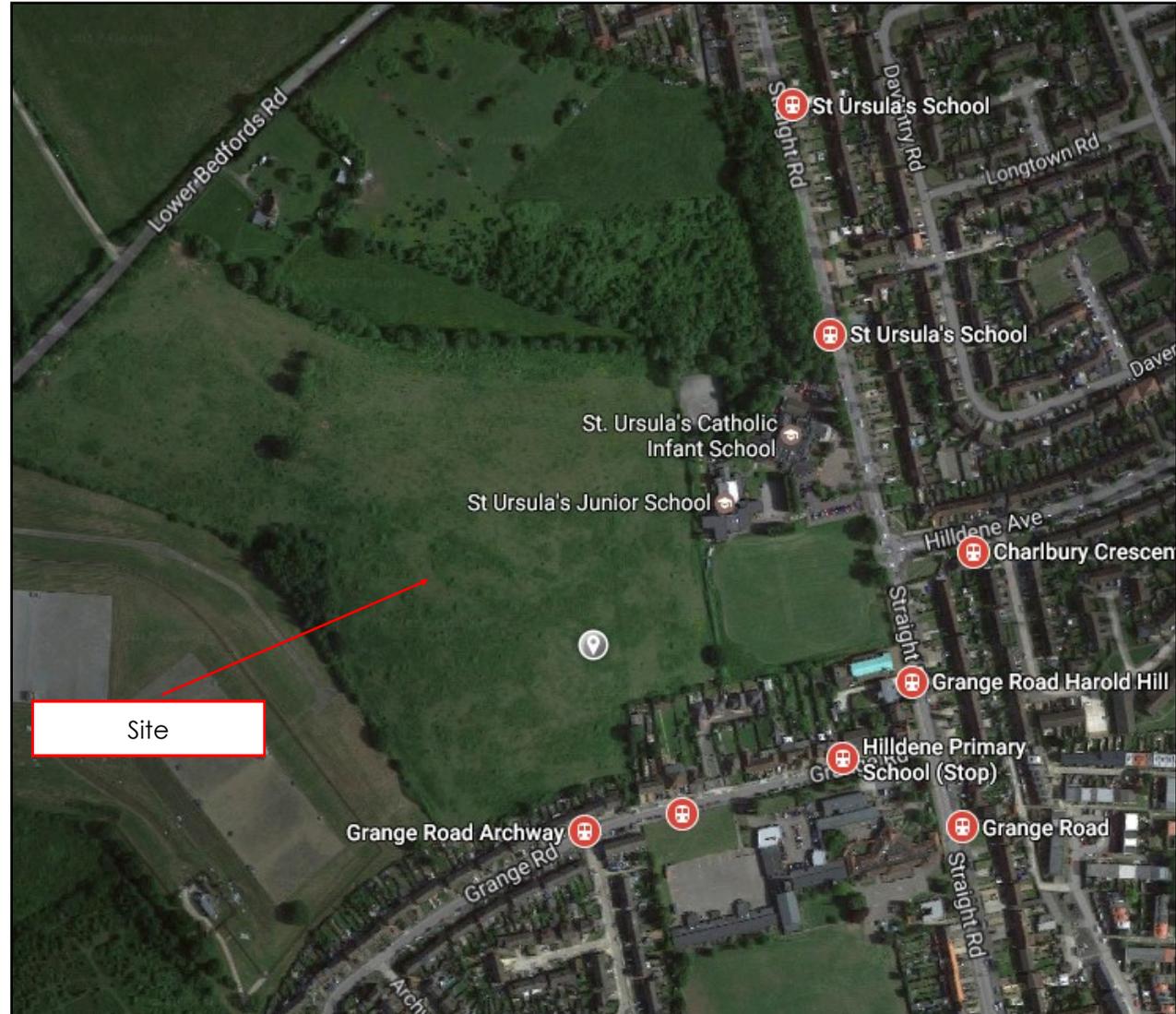


Figure 3 - Railway stations





3.9 - Site Access/Highway	
Does the site have a road frontage:	Yes - Lower Bedford Road and Grange Road.
Does the site have existing access.	There are two existing access points. One from Lower Bedford Road and a second point of access from Grange Road . (See figure 4).
Would the demolition of existing buildings be required to gain access to the site:	No
Do you own, or have unrestricted rights over, the existing proposed access to the site:	Yes

3.10 - Environmental Constraints	
EA Flood Zone:	No
Strategic Flood Risk Assessment:	Yes—SuDs applicable.
Potential contamination:	Unknown
Biodiversity/Ecology:	Yes – sites adjacent to areas of nature conservation interest. Ecology surveys are currently being undertaken.
Air Quality Management Area:	Yes
Open Space Deficiencies:	No
Environmental Protection Areas (within 5km):	No

Figure 4 - Existing Accesses.





3.11 - Other Constraints	
There are several trees marking the boundaries and a small group of trees to the south west. An arboricultural survey is currently being undertaken.	

3.12 - Development potential.	
Location:	The site is adjacent to the settlement boundary and could be a natural extension to the urban area.
What type of development would the site be suitable for:	Residential
How many dwellings could the site accommodate:	Approximately 130 dwellings. However this could be increased if deemed appropriate for the area.
Would the site accommodated a mix of market and affordable housing:	It is estimated that the site could comprise 83 market houses comprising 22 x 4/5 bed, 45 x 3 bed and 16 x 2 bed, together with 47 affordable house comprising 9 x 3 bed, 36 x 2 bed together with 2 blocks of flats of 1 and 2 bed. (See figure 5 for indicative layout plan)

