Brentwood Borough Local Plan 2013-2033, Regulation 18 Draft 03/16

Representations on behalf of CALA Homes (North Home Counties) Ltd

jb planning associates

[redacted]

Contents

Appendices

1 Introduction

1.1 These Representations are prepared on behalf of CALA Homes (North Homes Counties) Ltd in support of Brentwood Borough Council's decision to allocate 'Land adjacent to Ingatestone by-pass (part bounded by Roman Road)' (Site 079A) as Greenfield Green Belt release in the Brentwood Draft Local Plan (January 2016). Our completed comments is enclosed at Appendix 1.

1.2 These representations relate to the following aspects of the consultation document:-

- Strategic Objective 1: Managing Growth;
- Policy 5.1: Spatial Strategy;
- Policy 5.2: Housing Growth;
- Policy 7.2: Housing Mix, Types and Tenures;
- Policy 7.4: Housing Land Allocations;
- Policy 8.4: Employment Land Allocations;
- Appendix 2: Proposed Housing and Employment Delivery;
- Appendix 3: Housing Trajectory.

1.3 JB Planning Associates have previously prepared representations on behalf of the landowner of Site 079A in response to the Brentwood Local Plan Strategic Growth Options Consultation (January 2015) promoting the site as a suitable and sustainable location for growth to assist in meeting the significant housing needs of the Borough. With these representations a drawing was enclosed illustrating one way in which the site could be developed for residential purposes.

1.4 Since then, CALA Homes have acquired an interest in the site and further technical studies, including a Transport Appraisal, Ecological Assessment and Noise Assessment, have been undertaken to both support the Council's decision to allocate the site in the Draft Local Plan and also inform the

emerging development proposals. These representations summarise the findings of these technical studies (which are also enclosed as appendices), and also seek to justify a modest increase in the capacity of the site. We demonstrate that the site can make an important and early contribution towards meeting the significant and urgent need for new homes in Brentwood Borough, which provides further justification towards its release from the Green Belt.

2 Site Location

2.1 Site 079A 'Land adjacent to Ingatestone by-pass (part bounded by Roman Road)' covers approximately 1.39ha and comprises largely of vacant scrubland, screened by mature hedgerows. It is located on the edge of the urban area of Ingatestone, with the B1002 immediately to the north and the Ingatestone Bypass (A12) to the west providing strong defensible road boundaries. It is bounded to the south and east by residential development, and relates well to the existing urban area, forming a well-contained parcel that does not encroach into the open countryside. An extract from the Council's Site Allocation Maps Supporting Document (January 2016) showing the location of the site is included at Appendix 2.

2.2 Ingatestone is identified as a Settlement Category 2: Village Service Centre in the Draft Plan, and is described in para 5.28 as **"a district shopping centre with a good range of jobs, community and health facilities... As the Borough's largest village, facilities here serve a significant catchment beyond the immediate area. Public transport accessibility is relatively good. The village has a rail station and secondary school."** We support the Council's placing of Ingatestone in the second tier of the Borough's 'Hierarchy of Place' and agree that it has an important role to play in helping to meet housing needs over the plan period.

2.3 From a strategic transport perspective, Ingatestone is conveniently located within the A12 corridor, which contains the Borough's main settlements. This corridor is the focus for development over the plan period, as established through Strategic Objective 1 and emerging Policy 5.1: Spatial Strategy, which identifies that "**to meet local needs fully there will be limited release of Green Belt for development within transport corridors, in strategic locations to delivery self-sustaining communities with accompanying local services, and urban extensions with clear defensible physical boundaries to avoid further sprawl and provide development swiftly".**

2.4 We support this approach, and the Council's decision to identify Site 079A as one of the Green Belt releases in Policy 7.4 and Appendix 2. In view of the Council's strategy to focus growth in the A12 corridor, we consider the site to be particularly well positioned, on the edge of Ingatestone, and only a short

distance from connections to the A12. From a transport perspective it is also notable that it is within walking distance of sustainable transport connections including bus and rail services. These transport aspects are considered further in Section 4 below, and the accompanying Transport Appraisal (see Appendix 4).

2.5 Furthermore, when considering the overall sustainability of the site, it is also significant that an employment land allocation (Site 079C) has been identified directly to the north through Policy 8.4 'Employment Land Allocations'. We support the identification of Site 079C for employment generating uses, and consider it to be in a particularly suitable location with respect to transport connections, and it will benefit both new and existing residents of Ingatestone with respect to providing jobs and boosting the local economy.

2.6 From a Green Belt perceptive, and with regard to national policy in the National Planning Policy Framework (NPPF) on altering Green Belt boundaries, Site 079A is well enclosed with clear and permanent defensible boundaries, most notably the A12 corridor to the west, which will prevent unrestricted sprawl. Furthermore, its development will not result in neighbouring towns merging with one another, or encroachment into the open countryside. Also, the site does not form part of the setting and special character of a historic town, and its development will not compromise urban regeneration efforts, as we note that the Draft Local Plan recognises in paragraph 5.13 that brownfield land in the Borough's urban areas is a finite resource and not able to meet the significant level of housing need over the plan period.

2.7 It therefore does not contribute to any of the five purposes of Green Belts as set out in Paragraph 80 of the NPPF and its allocation is fully consistent with the Council's Spatial Strategy which seeks to identify urban extensions in the Green Belt with clear defensible physical boundaries.

3 Emerging Development Proposals

3.1 In conjunction with the technical work carried out to support the allocation of the site, an Illustrative Site Layout (see Appendix 3) has been prepared to demonstrate how the site is capable of delivering approximately 57 dwellings together with public open space and an area of children's play for the benefit of both new and existing residents living in the local area.

3.2 This represents an increase above the indicative capacity of the site, identified as 42 dwellings in Appendix 2 of the Draft Local Plan, which is based on an anticipated density of 30 dwellings per hectare (dph). When considering site capacities, we note that paragraph 5.42 of the Draft Local Plan identifies that "**the Council has applied densities to potential development sites in a realistic manner taking into account surrounding development and the general form of an area. However, given the large and urgent need for new homes sites in the most sustainable locations we will need to provide for higher densities where this is appropriate and taking into account any constraints**."

3.3 Para 5.44 continues **"The Council is keen not to be reliant on windfall to meet needs, and so continued work will be undertaken to determine realistic site densities for allocated sites to determine the remaining windfall contribution**."

3.4 Lastly, Policy 7.3 adds that **"Residential densities will be expected to be 30 dwellings per hectare net or higher unless the special character of the surrounding area suggests that such densities would be inappropriate; or where other site constraints make such densities unachievable. Higher densities, generally above 65 dwellings per hectare net, will be expected in town and district centres or other locations with good public transport accessibility**."

3.5 In view of the above statements, we consider that it is entirely appropriate for the site to be a developed at a higher density than 30 dph demonstrating a more efficient use of land. With respect to the general form of development in the area, a modern housing development on Hare Bridge Crescent, within 100m of the site on the eastern side of Roman Road, has been constructed at a density of 47 dph and establishes that densities of between 40 to 50 dph

are appropriate in this location. Furthermore, the findings of Conisbee's Transport Appraisal (discussed in Section 4) demonstrate that the site is within acceptable walking distance of local facilities, including bus and rail services. It can therefore be concluded that this represents a sustainable location with good public transport accessibility, and on this basis, in accordance with Policy 7.3, it would be appropriate to consider development densities above 30 dph.

3.6 A development of 57 dwellings (41 dph) is therefore considered to represent a more appropriate density for this site, and delivers on the Council's aspiration, with respect to Green Belt Site Allocations, "**to ensure the most efficient use of land is made in order to respond to the Borough's higher housing need and limited capacity"** (Para 9.77). Securing an additional 15 dwellings on this site will also help the Council with reducing its reliance on windfall development to meet housing need over the plan period.

3.7 Support for higher density development can also be taken from the Strategic Housing Market Assessment (SHMA) which, as identified in Paragraph 7.17 of the Draft Local Plan, **"concludes that there is a need for a higher proportion of two bedroom units to create a better housing offer and address the increasing need for smaller properties due to demographic and household formation change. Broadly, it recommends that future market housing delivery should be 65% one and two bedrooms while 35% should be larger units of three and four bedrooms."**

3.8 Draft Policy 7.2 'Housing Mix, Types and Tenure', encourages proposals to take account of the recommendations of the SHMA, whilst also acknowledging that **"the final housing, mix, type and tenure will be subject to negotiation at the planning application stage and account will also be taken of the nature, constraints, character and context of the site and development viability"**. We agree with this approach, and consider that a balance will need to be found when developing the proposals for the site at the planning application stage to ensure that efficient use of land is made to provide a mix of housing on site to meet a range of needs, whilst also delivering a development that is viable and appropriate to the character and context of the site and its surroundings.

3.9 Furthermore, an important consideration with respect to the density of development on this site will be the provision of public open space. A community green, including an area of children's play, has been included on the Illustrative Site Layout (Appendix 3) at the frontage of development with Roman Road for the use by both new and existing residents living in the local area. In accordance with Draft Policy 10.8, further discussions will be required at the planning application stage with respect to the type of facility provided. In view of the limited provision of existing recreational facilities in the village, particularly in the vicinity of the site, it is considered that this would provide a significant community benefit, and further justification to release the land from the Green Belt.

3.10 With respect to the timescales for delivery, we note that Appendix 3 'Housing Trajectory' of the Draft Local Plan identifies that the dwellings will come forward between 2018 and 2021 at a rate of 14 per annum.

3.11 We agree with the Council's decision to identify the site to come forward in years 1 to 5, which is supported by the conclusions reached in its SHLAA (2011) which identifies that there are no achievability concerns with the site, and no active uses that will affect its availability. In view of this, and the emerging development proposals for the site, we do however consider that the site is capable of delivering homes sooner and at a higher rate than currently anticipated by the Council. Taking account of the revised capacity of the site identified in our representations, the table below sets out our Client's estimated completion rate.

Year	Projected Completions
2017/18	26
2018/19	26
2019/20	5

Table 1: Housing Trajectory for Site 079A

3.12 We trust this is helpful in demonstrating that the development can be brought forward quickly in order to address the District's urgent shorter term needs, and we request that the Housing Trajectory is updated to reflect the above.

4 Technical Evidence to Support the Allocation

4.1 To support the Council's decision to allocate Site 079A in the Draft Local Plan and also inform the emerging development proposals for the site, a Transport Appraisal, Ecological Assessment and Noise Assessment have recently been carried out by a team of expert consultants. These are enclosed with our representations and the results summarised below.

Transport Appraisal (Appendix 4)

4.2 The Transport Appraisal, prepared by Conisbee, predicts the likely transport characteristics of the proposed development; considers any impacts on the surrounding highway network; and outlines what highway improvements would need to be made to accommodate the development.

4.3 The site is considered to be in a sustainable location, since Ingatestone has a range of retail, community, health and transport facilities, including a railway station, all of which are within walking distance of the site.

4.4 The Appraisal confirms that the development can be accessed from Roman Road, at the location of the existing field gate access. A simple priority junction will be sufficient to accommodate the traffic flows associated with the proposals and the visibility splays required for the surveyed speeds along Roman Road at the point of the proposed access can be achieved.

4.5 Based on the likely volumes of traffic to be generated by a development of the scale proposed, the Appraisal concludes that there is sufficient capacity on the local road network. Further capacity analysis will be required once the proposed development is fixed at the planning application stage in the form of a Transport Assessment.

4.6 With respect to mitigation, the Appraisal recommends that a Travel Information Pack be produced for all new residents to encourage sustainable travel habits. It also recommends that a footway be provided along the site frontage on Roman Road to provide pedestrian access with the existing footway to the south of the site and to the B1002 Roman Road to the north, where the nearest bus stops are located. This has been included in the emerging proposals for the site (see Appendix 3). It is also recommended that

a new uncontrolled pedestrian crossing of either Roman Road or B1002 Roman Road be provided to enable easier access to the bus stops.

Noise Assessment (Appendix 5)

4.7 The Noise Assessment, prepared by Cass Allen, considers the suitability of the site for residential development with regard to noise and vibration. The A12 is identified in the assessment as the primary source of noise on site, with locations on the western edge found to experience the highest noise levels. Based on the results of a site noise survey, a 3D noise model of the emerging development has been constructed, and used to predict the internal and external noise levels of the development when completed. It is established that acceptable internal noise levels can be achieved subject to the use of acoustically upgraded glazing and ventilation.

4.8 Externally, the recommended standards for amenity areas will be exceeded. However, the guidance acknowledges that it is not uncommon for noise levels in gardens in urban areas to be higher that recommended levels, and in such cases the development should be designed to achieve the lowest practical levels. In this case, Cass Allen, has advised that it considers the emerging development to provide the maximum protection from traffic noise from the A12, with the row of dwellings fronting the western edge providing protection to the rest of the development.

4.9 In terms of vibration, a qualitative assessment was undertaken during the site survey, and vibration levels found to be very low.

4.10 In view of the above, Cass Allen conclude that the site is suitable for residential development in terms of noise and vibration levels.

Ecological Assessment (Appendix 6)

4.11 The Ecological Assessment, prepared by Ethos Environmental Planning, considers the potential ecological constraints to the development of the site and also opportunities for ecological enhancement. The Appraisal identifies that the habitats on site are of low – moderate conservation value. Tall, ruderal habitat covers the majority of the site and was assessed as having a low botanical diversity. The hedgerows bounding the site were assessed as having moderate conservation value, with the exception of the defunct,

species poor hedgerow along the eastern boundary (from which vehicular access to the development would be taken from Roman Road).

4.12 The Ecological Assessment recommends replacing the defunct hedgerow along the eastern boundary with a native species rich hedgerow, and retaining and gapping up the hedgerows along the other boundaries to enhance their species diversity and structure. Bird and bat boxes can also be installed on retained hedgerow trees along the site boundaries to provide further ecological enhancements. The provision of a landscape buffer along the western boundary and area of public open space are also identified as a further opportunity to increase botanical diversity. These recommendations have been taken into account when developing the emerging proposals for the site as demonstrated by the Illustrative Site Layout (Appendix 3).

5 Conclusion

5.1 We have set out in these representations to explain the significant and valuable contribution that Site 079A can make towards meeting housing needs in the Borough. We are in strong support of the Council's decision to allocate the site as a Green Belt release in the Brentwood Draft Local Plan (January 2016). In view of the Spatial Strategy to meet local needs fully through limited releases of Green Belt for development within the A12 corridor, we consider the site to be in a particularly suitable and sustainable location for residential development.

5.2 These representations are accompanied by a number of technical studies which we trust the Council will find helpful in support of its decision to allocate the site. Through the technical work undertaken to date, it has been demonstrated that the site is sustainable; can be well integrated into the existing transport network; is suitable for development in terms of noise and vibration levels; and can be developed in a way that will enhance the ecological value of the site. We have also demonstrated through the design work undertaken that the site is capable of delivering approximately 57 market and affordable homes together with public open space and an area of children's play for the benefit of both new and existing residents living in the local area.

5.3 The emerging proposals therefore provide significant community benefits whilst delivering on the Council's aspiration to ensure the most efficient use of land is made in order to respond to the Borough's higher housing need and limited capacity. Furthermore, this development can be brought forward quickly in order to make an early and valuable contribution to the Council's housing land supply.

5.4 The table below provides a summary of our representations on the Draft Local Plan.

Policy / Paragraph	Support / Object / General Comment	Comment
Strategic Objective 1	Support	We support the objective of directing growth to the Borough's transport corridors.
Policy 5.1 (Spatial Strategy)	Support	We support the strategy of meeting local needs fully through limited releases of Green Belt for development within transport corridors.
Hierarchy of Place	Support	We support the placing of Ingatestone in the second tier of the Borough's 'Hierarchy of Place' and agree that it has an important role to play in helping to meet housing needs over the plan period.
Policy 7.2 (Housing Mix, Types and Tenures)	Support	We agree that the final housing, mix, type and tenure should be subject to negotiation at the planning application stage and take account of the SHMA but also the nature, constraints, character and context of the site and development viability.
Policy 7.3 (Residential Density) and Paragraphs 5.42 and 5.44	Support	We support the flexibility to allow higher residential densities in sustainable locations with good public transport accessibility.
Policy 7.4 (Housing Land Allocations) and Appendix 2	Support	We support the identification of Site 079A as a Green Belt release and proposed that the capacity of the allocation is increased in the interests of making the most efficient use of the site.

Policy 8.4 (Employment Land Allocations)	Support	We support the identification of Site 079C as a Green Belt release.
Appendix 2	Proposed Amendment	A development of 57 dwellings (41 dph) is considered to represent a more appropriate density for Site 079A, taking account of existing development in the local area; the site's sustainability and accessibility and the Council's aspiration to ensure the most efficient use of land is made in order to respond to the Borough's higher housing need and limited capacity.
Appendix 3	Proposed Amendment	Site 079A is capable of delivering homes sooner and at a higher rate than currently anticipated by the Council. See Table 1.

Table 2: Summary of Representations

JB/1250/JPD
22 March 2016

Appendix 1

Draft Local Plan
2013 - 2033
February 2016

COMMENT FORM

From 10 February to 23 March 2016 we are consulting on the Draft Local Plan for Brentwood Borough. You can view and comment on the Draft Local Plan online at **www.brentwood.gov.uk/localplan**

Alternatively, please use this form to share your views on the contents of the Draft Plan.

All responses should be received by Wednesday 23 March 2016

Please return forms to Planning Policy Team, Brentwood Borough Council, Town Hall, Brentwood, Essex CM15 8AY, or alternatively attach completed forms and email them to **planning.policy@brentwood.gov.uk**

Data Protection
All personal information that you provide will be used solely for the purpose of the Local Plan consultation. Please note whilst all addresses will be treated as confidential, comments will not be confidential. Each comment and the name of the person who made the comment will be featured on the Council's website.

By submitting this form you are agreeing to these conditions.

PERSONAL DETAILS					
Title:	Mr	First Name:	John	Last Name:	Boyd
Address:	[redacted]				
Post Code:	[redacted]			Telephone Number:	[redacted]
Email Address:	[redacted]				

YOUR COMMENTS

Please indicate which section(s) of the Draft Local Plan you are commenting on (where applicable please clearly state the Policy reference or paragraph number):

Please see our accompanying representations

Please specify if you Support, Object or are providing a General Comment:
(tick as appropriate)

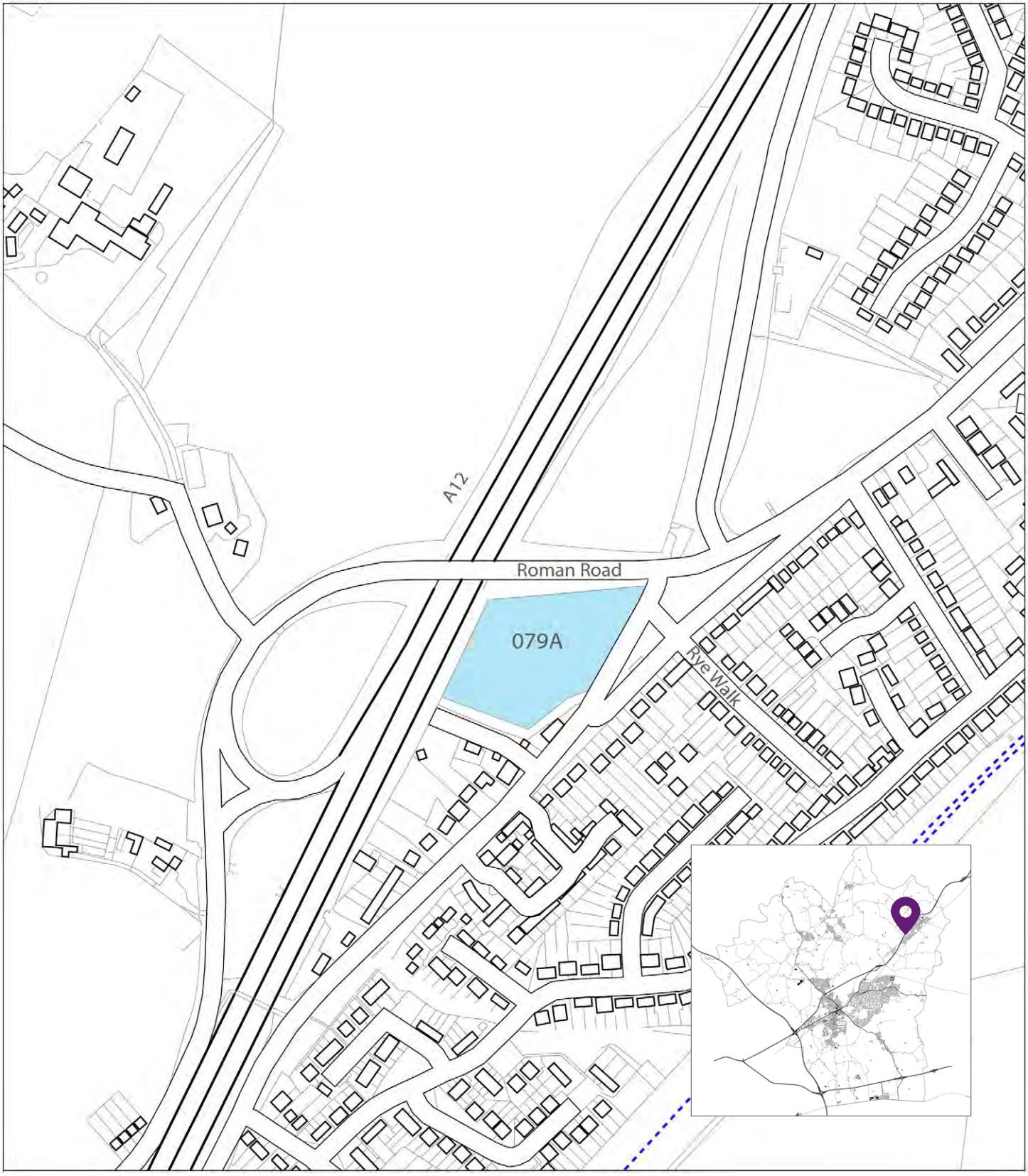
Support	☐
Object	☐
General Comment	☐

Comments (please use additional sheet if required):

Please see our accompanying representations

Thank you for taking the time to respond. Please return forms to Planning Policy Team, Brentwood Borough Council, Town Hall, Brentwood, Essex CM15 8AY, or alternatively attach completed forms and email to **planning.policy@brentwood.gov.uk**

Appendix 2



0 250 m

Site ref: 079A

Site Name: Land adjacent to Ingatestone by-pass (part bounded by Roman Road)

Area (ha): 1.39

Proposed use: Housing

Approximate Number of Dwellings: 42

Date: February 2016

BRENTWOOD BOROUGH COUNCIL

Appendix 3

CALA HOMES

Illustrative Layout Plan
Roman Road, Ingatestone

A2318 / SK08

Scale 1:500 @ A3 March 2016

OSP ARCHITECTURE

OSP Architecture, Broadmede House, Farnham Business Park, Weydon Lane, Farnham, Surrey, GU9 8QT, Tel: 01252 267878, www.osparchitecture.com

Appendix 4

conisbee | Consulting Structural Engineers
Consulting Civil Engineers

Roman Road, Ingatestone, Brentwood, Essex

Transport Appraisal

London
[redacted]

Norwich
2 Woolgate Court
St Benedicts Street
Norwich NR2 4AP
Telephone 01603 628 074

Cambridge
47 – 51 Norfolk Street
Cambridge CB1 2LD
[redacted]

Ref: 160104/H Jenkins

Approved By:

Date: 16 Mar 2016

Version: 1.4

Table of Contents

1.0 INTRODUCTION

1.1 Background

1.1.1 Conisbee has been appointed by Cala Homes to consider the transport implications associated with the development of land off Roman Road in Ingatestone, Essex. The emerging development proposals for the site provide 57 dwellings. The site is currently used as agricultural land.

1.1.2 The site is situated off Roman Road in Ingatestone, approximately 6.5km north east of Brentwood and 10.5km south west of Chelmsford.

1.1.3 The purpose of this statement is to provide initial transport advice, predict the likely transport characteristics of the proposed development, consider any impact on the surrounding highway network and identify any measures required to mitigate this impact.

1.2 Structure of the report

1.2.1 Following this introductory section, the report is structured as follows:

- Section 2 describes the existing transport conditions surrounding the site including accessibility by all modes of transport together with a review of personal accident data within the study area;
- Section 3 outlines the development proposals;
- Section 4 predicts the likely travel demand generated by the proposed development;
- Section 5 identifies any impact of the proposals on the surrounding transport network; and,
- Section 6 summarises the findings of the report.

2.0 EXISTING SITUATION AND ACCESSIBILITY

2.1 Site location

2.1.1 Ingatestone is classified as a 'District Centre' within Brentwood's Local Development Plan (2013-2033) and defined as a 'Settlement Category 2: Village Service Centre'. It is considered to play an important role providing a range of essential local services. The Local Development Plan describes Ingatestone as having good facilities including '*A district shopping centre with a good range of jobs, community and health facilities, Ingatestone currently provides the second category in the hierarchy. As the Borough's largest village, facilities here serve a significant catchment beyond the immediate area. Public transport accessibility is relatively good. The village has a rail station and secondary school.*'

2.1.2 The site is bounded by Roman Road to the east (including the rear of Heybridge Cottages), Roman Road B1002 to the north, A12 to the west and an un-named dead end lane to the south.

2.1.3 The location of the development site is shown in **Figure 2.1** below.

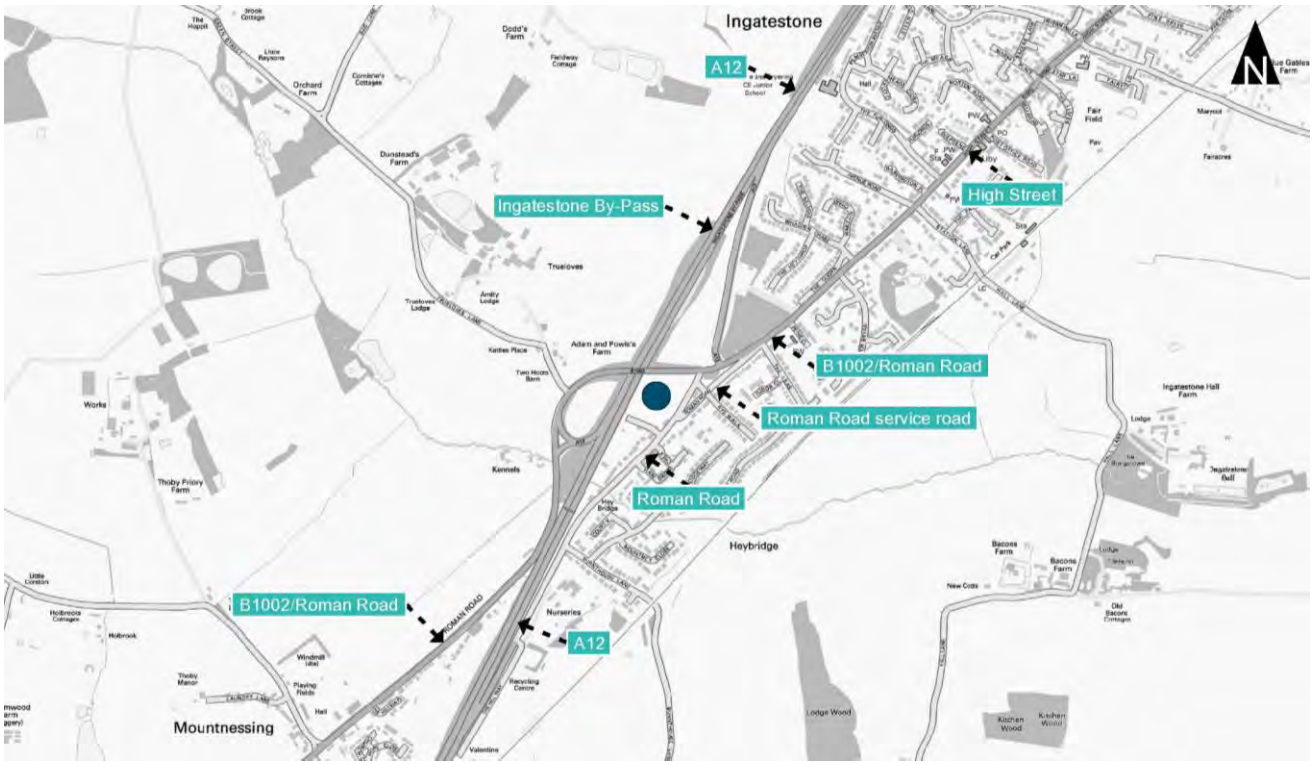


Figure 2.1 Site location and local highway network

2.2 Accessibility by walking and cycling

2.2.1 The site is accessible by walking and cycling as described in the following paragraphs.

Walking

2.2.2 The local footway network is comprehensive and the majority of the roads in the area surrounding the site include pedestrian footways on either one or both sides of the carriageway, providing links between the site and the local facilities.

2.2.3 Roman Road has good quality footways on both sides of the carriageway between the southern end of the site and Burntwood Lane. The footway continues south on the eastern side only to Ingatestone Garden Centre. There is an uncontrolled crossing with central pedestrian refuge approximately 300m south of the site connecting the eastern side of Roman Road to the subway under the A12. Roman Road outside the site does not have any footway provision, although at this point Roman Road branches to the east to provide access to a number of properties and this service road has a footway on the eastern side.

2.2.4 The B1002 Roman Road, to the north of the site, has a footway on the northern side only as it heads west over the A12. To the east of its junction with the Roman Road service road it has footways on both sides of the carriageway.

2.2.5 The Chartered Institution of Highways and Transportation (CIHT) guidelines 'Providing for Journeys on Foot' indicates that the desirable walking distance for commuting and school journeys is 500m, the acceptable walking distance is 1km and 2km is the preferred maximum.

2.2.6 The CIHT guidelines indicate that the desirable walking distance for 'Elsewhere', including local amenities, is 400m, the acceptable walking distance is 800m and 1.2km is the preferred maximum.

2.2.7 **Figure 2.2** overleaf shows the 2km isochrones (divided into 500m bands) from the centre of the proposed site, together with local amenities within walking distance. These local amenities within walking distance of the site include:

- Public transport services;
- Library;
- Post Office;
- Retail stores;
- Recreational ground; and,
- Schools.

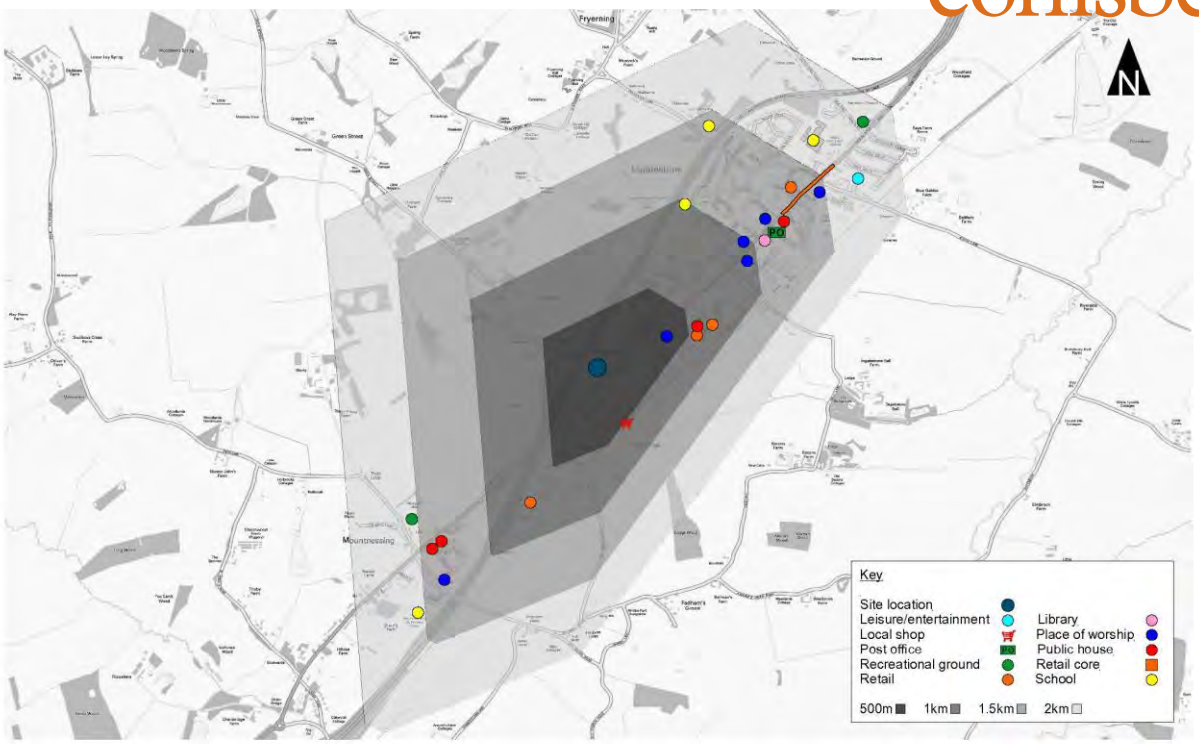


Figure 2.2 Local amenities within walking distance

Cycling

2.2.8 The development site is situated approximately 5km from the nearest cycle route. Cycle Route 13 is part of the National Cycle Network (NCN), and is located east of the site.

2.2.9 Route 13 will connect Tower Bridge in London with Fakenham in Norwich, via Basildon, Billericay, Chelmsford and Colchester. The route is currently under development but many sections are already open.

2.3 Accessibility by public transport

Bus services

2.3.1 The nearest bus stops to the site are on the B1002 Roman Road heading east (360m from the centre of the site) and west (300m from the centre of the site). Both bus stops have shelters. The Institute of Highways and Transportation provides guidelines on bus stop location and 400m is an acceptable walk distance to a bus stop in an urban area. Routes serving the bus stops on B1002 Roman Road are set out in **Table 2.1** overleaf:

Table 2.1 Summary of bus information

Route no.	Nearest bus stops to site (m)	Route	Weekday frequency
351	300/360	Brentwood – Ingatestone – Chelmsford	2 per hour
C4	300/360	Maldon – Danbury – Chelmsford – Margaretting – Brentwood	2 per day (school times)

2.3.2 The location of the bus stops, together with the routes that call at these stops, is shown in **Figure 2.3** below.

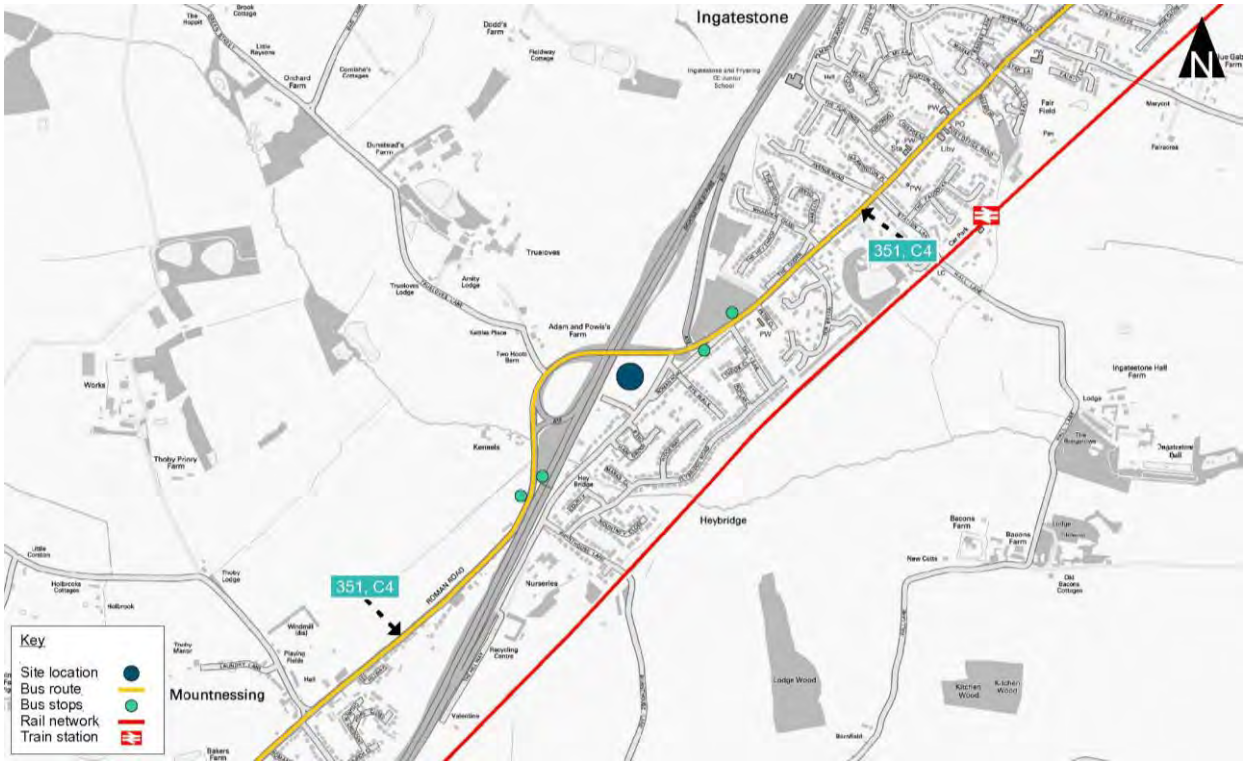


Figure 2.3 Local public transport infrastructure

Rail services

2.3.3 The nearest railway station is Ingatestone, less than 1.3km to the north east of the site. The station is on the Great Eastern Main Line with services running between London Liverpool Street (two per hour), via Shenfield and Stratford, and Clacton on Sea (one per hour) via Colchester, and Braintree (one per hour) via Chelmsford. The station has 18 secure cycle storage spaces and 333 chargeable car parking spaces.

2.4 Local highway network

Table 2.2 Description of local highway network

	Description
Roman Road	
Description	Single carriageway, local access road, with footways along both sides of the carriageway. North of the site the road continues for approximately 90m where the road then becomes B1002 Roman Road. South of the site the road continues for approximately 790m where the road merges with the A12 dual carriageway.
Width	7.5m
Speed limit	40mph
Street lighting	Along its length
Crossing facilities	Uncontrolled crossing with central pedestrian refuge
Bus route	No
Character	Residential road
On-street parking	Yes
B1002 Roman Road	
Description	Single carriageway, local distribution road, with footways along both sides of the carriageway. At the southern end of the road is the roundabout with the A12/Chelmsford Road and to the north the road becomes High Street.
Width	7m
Speed limit	40mph reduces to 30mph to the north (approx. 300m to the north of the junction with Roman Road)
Street lighting	Along its length
Crossing facilities	Zebra crossing near High Street
Bus route	Yes
Character	Rural road surrounded by residential properties
On-street parking	Parking allowed near Roman Road and parking restrictions introduced to the north

2.4.1 The highway network in the vicinity of the site is shown in Figure 2.1.

2.5 Car ownership levels

2.5.1 Census data for Ingatestone shows that car ownership for this area is typical for Essex. The car/van availability per household is 1.34 per property for properties off Hare Bridge Crescent on the opposite side of Roman Road.

2.6 Accident analysis

2.6.1 Personal injury accident data has been obtained for the period 2010 to 2014 (inclusive) for the study area and **Figure 2.4** below shows the location and severity of accidents that occurred during this period. The severity of accidents and number of casualties per year is summarised in Table 2.3 below.

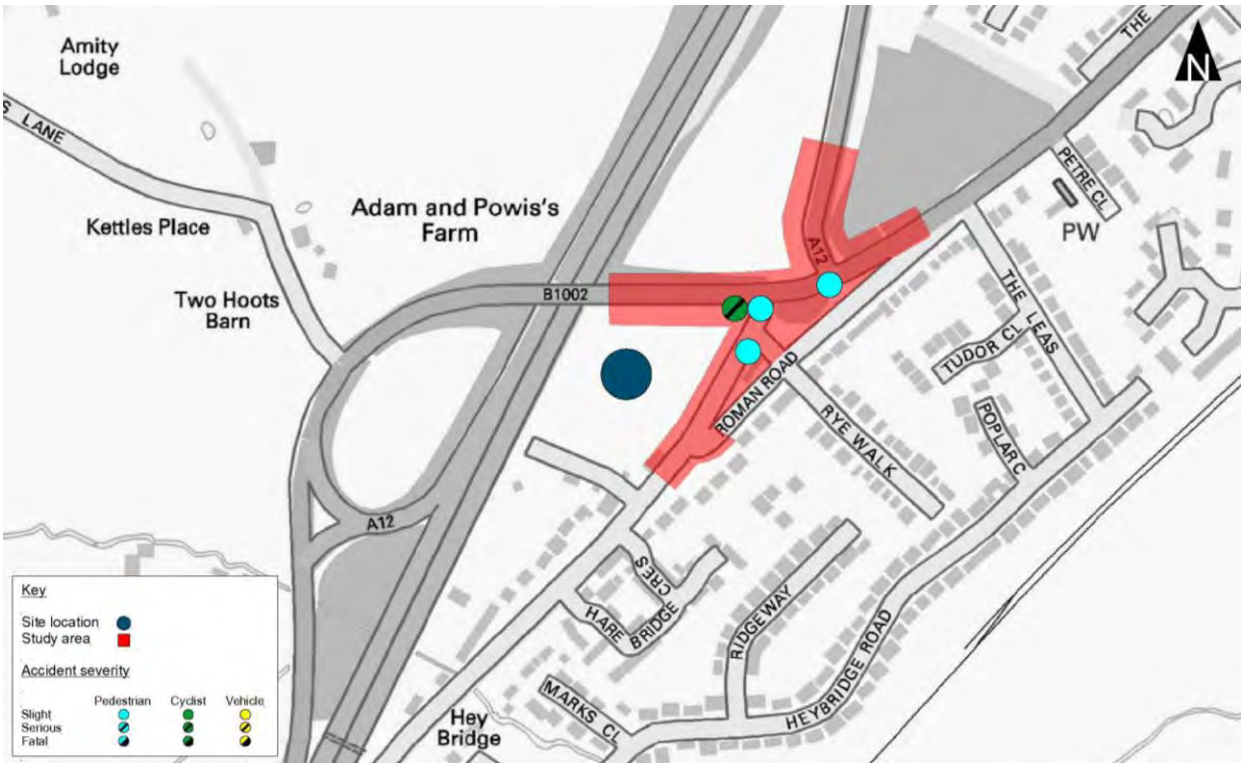


Figure 2.4 Personal Injury accident data

Table 2.3 Summary of personal injury accident data

	Personal injury			No. of casualties
	Fatal	Serious	Slight	
2010	0	0	0	0
2011	0	0	0	0
2012	0	1	1	3
2013	0	0	2	3
2014	0	0	0	0
Total	0	1	3	6

2.6.2 It can be seen from Table 2.3 and Figure 2.4 above that a total of four accidents (resulting in six casualties) occurred within the study area over the most recent five-year period, with three accidents resulting in slight injuries being sustained and one accident resulting in serious injuries being sustained. In total, the four accidents resulted in six casualties.

2.6.3 It is considered that the accident rate is below the anticipated accident rate for the type of junction and the existing volume of traffic along the B1002 Roman Road. It is therefore considered that there is no particular accident pattern on the local highway network, and that the proposed development will have no material impact on road safety.

3.0 DEVELOPMENT PROPOSALS

3.1.1 This section of the report sets out the development proposals and considers the proposed access arrangements and on-site parking provision.

3.1.2 The emerging development proposals for the site include 57 residential dwellings with a mix of houses and apartments. **Figure 3.1** shows an illustrative layout plan of the site.

Figure 3.1 Illustrative layout plan

3.2 Access to the site

3.2.1 As part of the development of the site, it is proposed to construct an access for vehicles, cyclists and pedestrians onto Roman Road in the location of the existing field access. **Figure 3.2** shows the design of the proposed access.

3.2.2 The proposed access is a simple priority junction, as shown in Figure 3.2 below. Technical Design Note 42/95 sets out the geometric design of priority junctions which notes that for new rural junctions right turn lanes should only be provided when the minor road traffic flow exceeds 300 vehicles per day and the major road traffic flow exceeds 13,000 per day. Upgrading to a ghost island right turn lane at priority junctions, should always be considered for minor road flows exceeding 500 vehicles per day. Even at flows of higher than 500 vehicles per day for the minor arm more recent guidance (Chartered Institution of Highways and Transportation 2010) acknowledges that junctions without ghost island provision are often able to cater for higher levels of turning traffic without resulting in significant congestion.

3.2.3 The nature of the junction design should take into account traffic flows as well as proportions of heavy goods traffic, which for this site will be very low. The impact on traffic delay to passing traffic should also be considered and in this case passing traffic is not significant. A one day automatic traffic count undertaken on Roman Road on Thursday 10th March 2016 showed that daily 24 hour two-way traffic flows along Roman Road were less than 3,500.

3.2.4 The travel characteristics of this site, including likely traffic generation, are set out in Section 4, and while daily vehicle movements on the minor arm are likely to be more than 300 vehicles per day, they do not justify the provision of a ghost island right turn lane. Provision of a ghost island right turn lane would also be out of character with the other junctions along this road.

3.2.5 The proposed access has been designed in accordance with the standards set out in the Essex Design Guide.

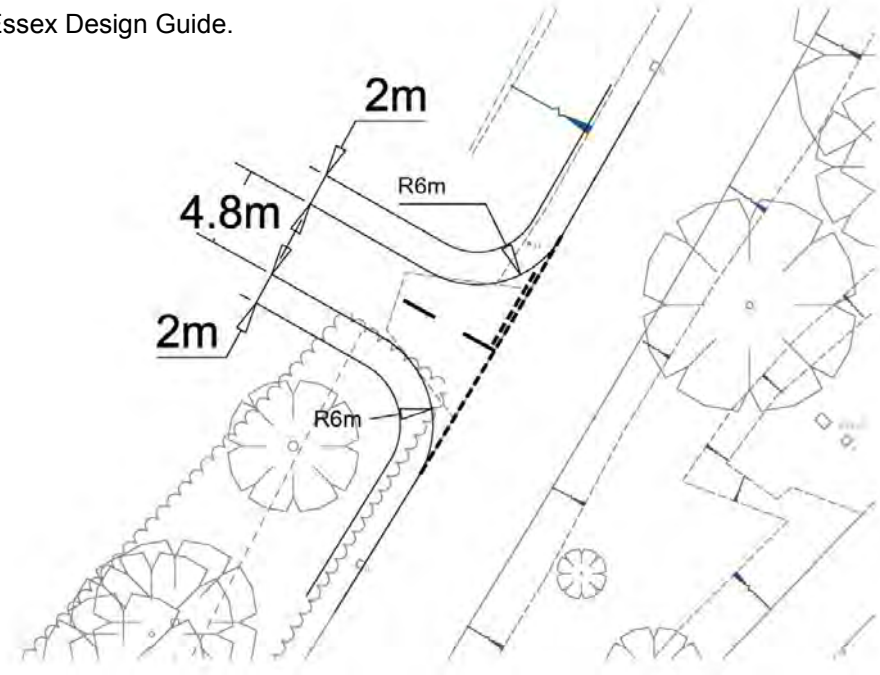


Figure 3.2 Site access layout

Visibility

3.2.6 The speed limit of Roman Road is 40mph and the desirable minimum sight stopping distance requirement for the posted speed of the road is 120m (as set out in Technical Design Note 9/93). A one day speed survey was carried out along Roman Road, just south of the site access which showed that 85th percentile dry weather speeds for northbound and southbound vehicles was 38.5mph. In accordance with design advice TA 22/81 (Speed Measurement on All Purpose Roads) this dry weather speed for single carriageway roads has been adjusted to wet weather speed, which equals 36mph. For non-trunk roads with a speed of less than 37mph, guidance set out in Manual for Streets applies. Based on Manual for Streets a visibility splay of 56m is required, which can be achieved easily. There is a clear visibility splay to the north (to the junction with B1002 Roman Road) and to the south a visibility splay of 97m can be achieved. The achievable visibility splay at the access is shown in Appendix A.

3.3 On-site parking provision

3.3.1 The level of on-site car and cycle parking provision is to be established at the planning application stage, when further detail is available on the proposed mix for the development. Regard will be had to Essex County Council Parking Standards 2009 at this time.

4.0 TRANSPORT CHARACTERISTICS

4.1.1 This section of the report predicts the likely volumes of traffic generated by the proposed development.

4.2 Vehicle trip generation for proposed use

4.2.1 The proposals are for 57 residential units including mixed private and affordable housing. The TRICS 7.1.3 trip generation database has been reviewed in order to predict the likely level of trips generated by the proposals. In order to consider a worst case scenario, 85th percentile rates have been used with sites in locations with the highest population densities excluded.

Residential use – mixed private and affordable housing

4.2.2 Sites have been selected within the following parameters:

- Land use: Residential – mixed private and affordable housing (no flats)
- Survey days: Monday – Friday
- Size of selected sites: 30 to 100 dwellings
- Regions selected: UK (except Greater London, Northern Ireland and Republic of Ireland)
- Locations: Excluding higher population density and town centres.

4.2.3 A total of 15 sites have been selected and the daily arrival and departure profile for these sites is summarised in **Table 4.1** below. The assessment is based on 85th percentile rates and a mix of private and affordable houses only to ensure it is robust.

Table 4.1 Summary of vehicle trip rates and trip generation – residential use

Time period	Arrival trip rate	No. of arrivals	Depart trip rate	No. of departs	Total trip rate	Total no. of trips
AM	0.246	14	0.386	22	0.632	36
PM	0.590	34	0.128	7	0.718	41
Daily 12hr	2.702	154	2.789	159	5.491	313

4.3 Distribution of traffic

4.3.1 Traffic generated by the development has been distributed on the basis of Census travel to work data (**Figure 4.1**) with traffic assigned on the local highway network as set out in **Figure 4.2** overleaf.

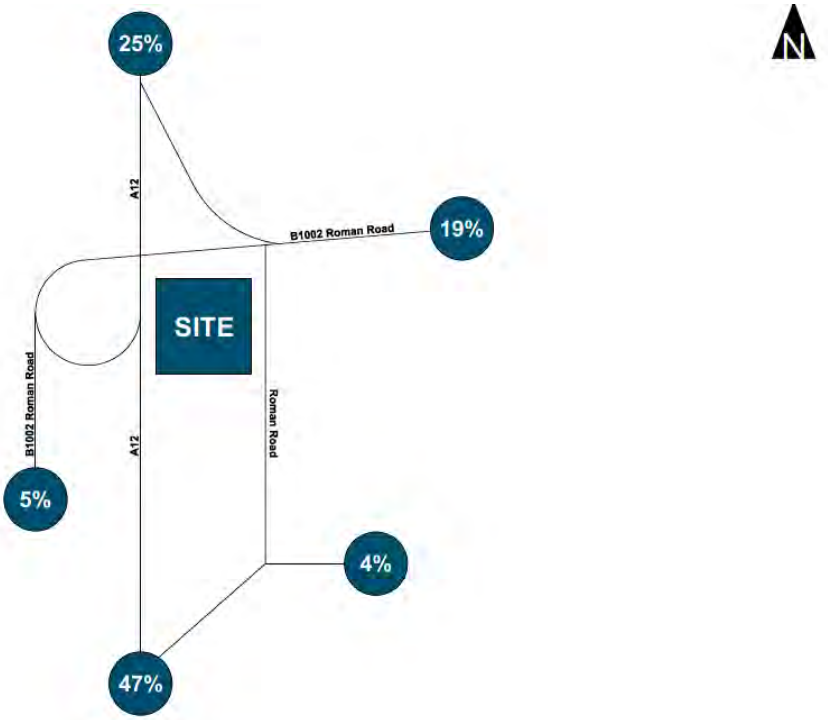


Figure 4.1 Distribution of development generated traffic

4.3.2 It can be seen from Figure 4.1 that the most popular destination for trips to work is to Brentwood in the south with 47% of journeys to work heading in this direction. Chelmsford is also a popular work destination as well as working in Ingatestone, with nearly 20% of people from Ingatestone working within Ingatestone.

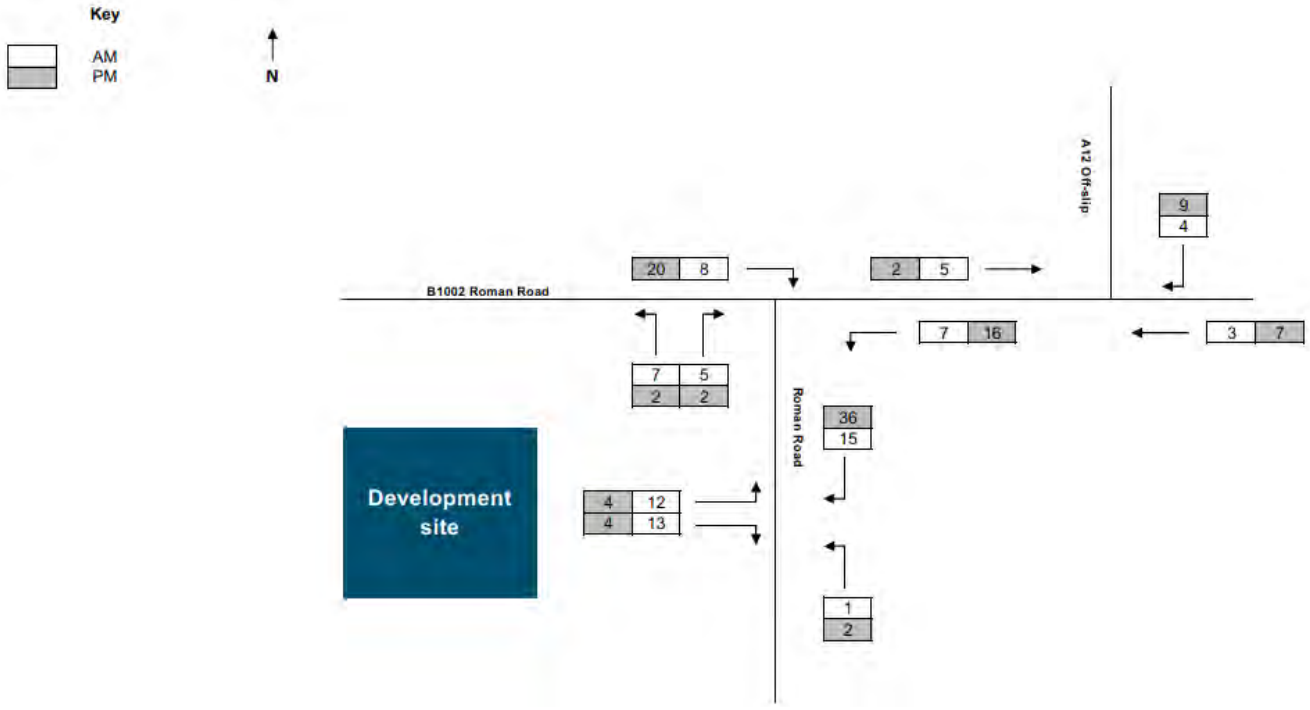


Figure 4.2 Assignment of development generated traffic

5.0 POTENTIAL IMPACT AND MITIGATION MEASURES

5.1.1 This section of the report considers the potential impact of the development proposals on the surrounding highway network and recommends mitigation measures to address this impact.

5.2 Potential impact on the highway network

5.2.1 Discussions have been held with Essex Highways regarding the extent of the local highway network to be considered in order to establish whether the highway network can accommodate the development generated traffic. It will be necessary to undertake a full capacity analysis using PICADY to assess the operation of the following junctions:

- Site access;
- Roman Road/B1002 Roman Road; and,
- B1002 Roman Road/A12 off slip.

5.2.2 Traffic surveys will need to be carried out at these junctions to establish existing traffic flows, background traffic growth will then need to be added to the anticipated year of opening of the development and traffic associated with any committed developments added. Traffic generated by the development will then need to be added to analyse the operation of the junctions listed above. Given the level of traffic generated, it is considered that there is likely to be sufficient capacity at these junctions to accommodate this traffic.

5.3 Mitigation measures

5.3.1 It is recommended that a footway (approximately 2m wide) be provided along the site frontage on Roman Road. This will connect with the footway at the southern corner of the site and, to the north, with the B1002 Roman Road and, as shown on Figure 3.1the illustrative layout plan, has been included in the emerging proposals. It is also recommended that pedestrian routes to the bus stop and into the centre of the village are considered with a view to providing crossing facilities (probably in the form of an uncontrolled crossing with or without central pedestrian refuge). Potential locations for a pedestrian crossing are either to the east of the site across Roman Road to connect with the footway on the eastern side of the Roman Road service road or to the north of the site on B1002 Roman Road.

Residential Travel Information Pack

5.3.2 The provision of a Travel Information Pack for new residents can improve the sustainability of the site through the promotion of more sustainable modes of travel. Essex County Council has developed a pre-assembled Travel Information Pack which can be purchased and provides information and links to public transport timetables and ticketing, as well as guidance on other sustainable modes of travel.

6.0 SUMMARY AND CONCLUSIONS

6.1 Background

6.1.1 This Transport Appraisal has been produced to consider the transport implications of the development of land off Roman Road in Ingatestone for residential use.

6.2 Development proposals

6.2.1 As part of the development of the site, it is proposed to provide 57 residential dwellings. The development will be accessed from Roman Road, at the existing field gate access. A simple priority junction will be sufficient to accommodate the traffic flows associated with the proposals and the visibility splays for the surveyed speeds can be achieved.

6.3 Travel characteristics

6.3.1 It is likely that the proposed development will generate 41 vehicle movements in the AM peak period and 46 vehicle movements in the PM peak period and 357 daily vehicle movements.

6.4 Potential impact

6.4.1 It is considered that the traffic generated by the development can be accommodated on the local highway network although a full capacity analysis of the site access, Roman Road/B1002 Roman Road and B1002 Roman Road/A12 off slip junctions will need to be carried out.

6.5 Conclusions

6.5.1 Based on the results of the Transport Appraisal, it is considered that the emerging development proposals can be accommodated on the surrounding transport network. Further work will be required once the proposed development is fixed at the planning application stage in the form of a Transport Assessment.

6.5.2 The site is considered to be in a sustainable location. Ingatestone has a range of retail, community and health facilities and the site is within walking distance of public transport facilities.

6.5.3 The impact of the development can be reduced by the following measures:

- Production of a Travel Information Pack for all new residents to encourage sustainable travel habits;

- Provision of a footway along the site frontage on Roman Road to connect the site access with the start of the existing footway at the southern corner of the site on Roman Road and to the B1002 Roman Road;
- Consider providing new uncontrolled pedestrian crossing to enable easier access to the bus stops.

Appendix A

Visibility splay at site access

Appendix 5

cass allen

NOISE ASSESSMENT

ROMAN ROAD, INGATESTONE

CALA HOMES LTD

RP01-16139

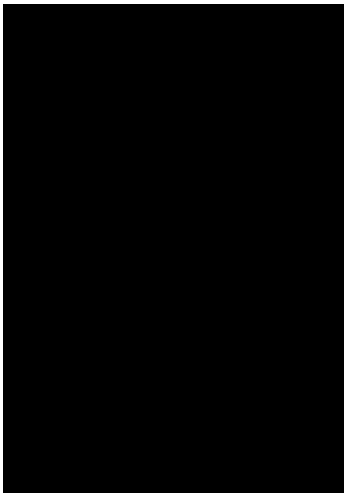
NOISE ASSESSMENT

PROJECT: ROMAN ROAD, INGATESTONE

CLIENT: CALA HOMES LTD

CLIENT ADDRESS:

COMPANY ADDRESS:



DOCUMENT CONTROL:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	07 March 2016	Tim Coombes, BMus AMIOA, Acoustic Consultant	Sam Bryant, MPhys MIOA, Senior Acoustics Consultant	Initial issue
1	18 March 2016	Tim Coombes, BMus AMIOA, Acoustic Consultant	Sam Bryant, MPhys MIOA, Senior Acoustics Consultant	Initial issue
2	22 March 2016	Tim Coombes, BMus AMIOA, Acoustic Consultant	Sam Bryant, MPhys MIOA, Senior Acoustics Consultant	Minor amendments

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Cass Allen Associates has been instructed by CALA Homes Ltd to assess the suitability of a proposed new development at Roman Road, Ingatestone, Essex in terms of noise and vibration.

1.2 The assessment has been carried out in accordance with relevant local and national planning guidance.

1.3 The aims of the assessment were:

- To establish the suitability of existing noise and vibration levels at the site for the proposed development;
- Where required, identify appropriate mitigation measures to achieve acceptable noise and vibration levels in the finished development;

1.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

2. PROJECT DESCRIPTION

2.1 The site is located on the western edge of an existing residential area. The site is bounded to the west by the A12 (Ingatestone Bypass), to the north by Roman Road B1002 and to the east by Roman Road.

2.2 An annotated aerial photo of the site is shown in Figure 1 below.

Figure 1 Annotated Aerial Photo

2.3 The proposal is to development the site into residential properties, comprising a total of 57 houses and flats. A current drawing of the proposed development layout is shown in Appendix 1.

3. PLANNING POLICY

National Policy

3.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Section 109 of the NPPF states:

> *The planning system should contribute to and enhance the natural and local environment by…preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…noise pollution.*

and in section 123:

> *Planning policies and decisions should aim to:*
>
> - *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
> - *mitigate and reduce… other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
> - *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;*
> - *and identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

Local policy

3.2 Chapter 11 of Brentwood Borough Council's Local Plan 2005, 'Pollution Control', provides outline guidance and considerations regarding noise affecting new residential development in the borough. The policy contains reference to PPG24 and BS8233 and states that "noise sensitive developments such as housing, hospitals and schools should be located away from existing sources of significant noise such as heavily trafficked roads and railways" and "applications for developments that have the potential to have a detrimental impact on noise levels experienced by existing or proposed occupiers will need to detail noise attenuation methods to be employed and demonstrate that the resultant noise levels will not have a detrimental impact on nearby occupiers".

3.3 To address the requirements of the national and local policies, the following key acoustic matters have been assessed:

- Noise affecting the habitable areas of the proposed development;
- Ground-borne vibration affecting the habitable areas of the proposed development;

3.4 The above matters are discussed in turn in the following sections of this report.

4. NOISE AND VIBRATION AFFECTING THE DEVELOPMENT

4.1 The noise levels that will exist within the habitable areas of the finished development have been predicted based on the existing noise environment at the site and outline details for the design of the development. The predicted noise levels have then been compared with appropriate design criteria. Where the criteria have been predicted to be exceeded, suitable mitigation measures have been identified.

Design criteria – Internal noise levels

4.2 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'.

4.3 Relevant BS8233 design criteria are summarised in Table 1 below.

Table 1 BS8233:2014 Internal Noise Criteria

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour

4.4 It is also considered appropriate in this case to assess the potential impact of noise emissions from individual vehicle passes on the bedrooms of the development during the night-time. This is in line with guidance given in BS8233:2014, which points out that regular individual noise events during the night have the potential to cause sleep disturbance.

4.5 Appropriate design criteria for acceptable maximum noise levels in habitable rooms of new residential developments are given in the World Health Organisation (WHO) document 'Guidelines for community noise', which recommends that "noise exceeding 45dB LAFmax should be limited, if possible" and that "for a good sleep, it is believed that indoor sound pressure levels should not exceed 45dB LAmax more than 10-15 times per night".

4.6 BS8233 also states that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as a upper guideline value. BS8233 recognises however that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, BS8233 states that the development should be designed to achieve the lowest practical noise levels in the amenity spaces.

4.7 The following acoustic design criteria have therefore been adopted for the development:

- Average noise levels in living rooms and dining rooms during the day should not exceed 35 dB LAeq,0700-2300hrs and 40 dB LAeq,0700-2300hrs respectively;
- Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
- Maximum noise levels should not regularly exceed 45 dB LAmax in bedrooms during the night;

- Where possible, average noise levels in external amenity areas during the day should be lower than 50-55 dB LAeq,0700-2300hrs.

Existing site noise and vibration levels

4.8 A noise survey was carried out at the site between 11th and 12th January 2016 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.

4.9 Noise levels across the site were generally dictated by road traffic on the surrounding road networks. The A12 was the primary source of road traffic noise with secondary contributions from Roman Road B1002 and Roman Road.

4.10 During the night-time period of the noise survey, road works were being undertaken on the A12. Due to the construction work, elevated noise levels were observed between the hours of 9pm and 11pm and between midnight and 4am. Average noise levels from road traffic on the A12 have therefore been interpolated from the data excluding the influence of construction work. The night-time average noise level (LAeq,2300-0700hrs) is largely dictated by traffic flow between 5am and 7am, which was unaffected by construction noise, and therefore this is considered to be representative of a typical night-time period.

4.11 Noise was also identified from trains on the nearby railway lines however noise from the trains was generally insignificant when compared with noise from road traffic noise.

4.12 Areas of the development at the western edges of the site will be subject to the highest noise levels. The noise survey results show that noise levels at these positions are as follows:

- Western edge of the site facing A12:
    - Average noise levels during the daytime - 73 dB LAeq,0700-2300hrs;
    - Average noise levels during the night-time - 69 dB LAeq,2300-0700hrs;
    - Typical maximum noise levels during the night-time – 78 dB LAmax.

4.13 During the site survey, vibration levels were qualitatively assessed and found to be very low. Vibration from the surrounding road networks is therefore not expected to have an adverse impact on the proposed development. Ground-borne vibration has therefore not been considered further in this assessment.

4.14 Based on the results of the site noise survey, a 3D computer noise model was developed to predict and assess the noise levels that will exist across the entire development.

4.15 The 3D noise model was developed using Cadna/A v4.6 environmental noise modelling software. Cadna/A incorporates the calculation methodology outlined in the Department of Transport Welsh Office - *Calculation of Road Traffic Noise* (CRTN) for the assessment of road traffic noise propagation.

4.16 The layout of the development and surrounding area was input into the model. To calculate the spread of noise levels around the site, day-time average noise levels were input for the surrounding roads (e.g. A12, Roman Road B1002 and Roman Road) and calibrated to the results of the on-site noise measurements. The methodology and results of the noise modelling are provided in Appendix 3.

Internal noise levels in noise-sensitive rooms

4.17 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design). Consequently, internal noise levels would be dictated by external noise ingress via glazing and ventilators.

4.18 The ventilation scheme for the project has not yet been decided and therefore, for the purpose of the assessment, it has been assumed that where possible units will be ventilated via trickle ventilators in the external facades with openable windows for the provision of purge ventilation (as per System 1 or System 3 from Building Regulations Part F).

4.19 Where noise levels are highest, a whole-house ventilation system with mechanical supply will be required, such as Mechanical Ventilation with Heat Recovery (MVHR) i.e. System 4 from Building Regulations Part F. This eliminates the need for background ventilators in the external façades (e.g. trickle ventilators) and therefore for these areas internal noise levels would be dictated by external noise ingress via the glazing. The MVHR system should be specified such that suitable ventilation rates to achieve thermal comfort during hotter periods will be achievable without residents having to rely on open windows.

4.20 The façade specification detailing which houses/flats will require whole-house ventilation is given in Appendix 4.

4.21 Calculations were carried out using façade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation to achieve the nominated internal noise criteria in the 'worst-case' habitable rooms of the development (i.e. the habitable rooms for each glazing/ventilation specification that will be subject to the highest external noise levels). The calculations included a 3 dBA design margin.

4.22 If acceptable internal noise levels can be achieved in 'worst case' habitable rooms then it follows that acceptable internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.

4.23 The calculations were carried out based on the following typical dimensions/details for facade elements:

- Glazing – 1.5m^2 for bedrooms and 2m^2 for living rooms;
- External walls – 8m^2 for bedrooms and 15m^2 for living rooms; and
- 2 in-frame trickle ventilators in bedrooms and 3 in-frame trickle ventilators in living rooms.

4.24 The results of the calculations are shown in Appendix 5 and the required glazing and ventilator performance is summarised in Table 2 below.

Table 2 Acoustic Requirements for 'Worst Case' Habitable Rooms

Façade Specification (see Appendix 4)	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements
FC01	40 dB Rw+Ctr	N/A
FC02	38 dB Rw+Ctr	42 dB Dne,w + Ctr
FC03	33 dB Rw+Ctr	40 dB Dne,w + Ctr

Note The requirements given are based on preliminary calculations and should be confirmed at the detailed design stage when full design details are available.

4.25 The required sound insulation performance values in Table 2 could typically be achieved by the glazing and ventilator types shown in Table 3.

Table 3 Typical Glazing / Ventilator Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
8.8mm/16/4mm acoustically upgraded thermal double glazing	33
10mm/16/8.8mm acoustically upgraded thermal double glazing	38
8.8 / 6to20 / 12.8mm acoustically upgraded thermal double glazing	40
Ventilators	Typical Acoustic Performance (Dnew + Ctr)
Passivent AL-dB 450 in-frame trickle ventilator	40
Passivent AL-dB 800 in-frame trickle ventilator	42

4.26 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the specification of suitable glazing and ventilation systems, as specified in Appendix 4 at the detailed design stage (which could be secured with a suitable planning condition). It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.

Noise levels in external amenity areas

4.27 The layout of the development has also been reviewed in relation to the BS8233 recommendation that noise levels in external amenity areas should ideally not exceed 50 – 55 dB LAeq,T.

4.28 It can be seen from the 3D noise modelling that the development is arranged in a way that provides the gardens with the maximum protection from road traffic noise from the A12, with the row of houses along western edge of the site providing protection to the associated gardens and the rest of the development. This provides an effective method of reducing noise levels within these gardens and is considered 'best practice' in terms of noise control via site layout.

4.29 The site also benefits from the existing height difference between it and the A12 as well as the proposed landscape buffer to along the western site boundary. Also proposed at the north eastern

corner of the site is a public open space, this also provides beneficial separation for a number of the dwellings from the northern section of Roman Road.

4.30 Based on the proposed layout of the development, the average noise level in the gardens is calculated to range between 57 and 63 dB LAeq,T. Although this exceeds the 55 dB LAeq,T limit, BS8233 states that it is not uncommon for noise levels in gardens in urban areas to be higher than the recommended levels and the development should be designed to achieve the lowest practical noise levels in the amenity spaces. Given the reduction in external noise levels provided by the site layout itself, it is our view that the proposed scheme achieves the lowest practical noise levels and suitably mitigates noise impact.

5. CONCLUSIONS

5.1 Cass Allen Associates was instructed by CALA Homes Ltd assess the suitability of the site for the proposed development with regards to noise and vibration.

5.2 The assessment was carried out in accordance with relevant local and national planning guidance.

5.3 A noise and vibration survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from A12, Roman Road B1002 and Roman Road.

5.4 A 3D noise model of the development was constructed based on the results of a site noise survey. The noise model was used to calculate road traffic noise levels at all facades of the development.

5.5 Acceptable internal noise levels are predicted to be achieved in habitable rooms of the development subject to the adoption of acoustically upgraded glazing and ventilation in the development design. This will be investigated further at the detailed design stage and may be secured by the imposition of a noise related planning condition if deemed necessary by the Local Planning Authority.

5.6 Noise levels in external amenity areas exceed the upper limit given in BS8233 however, in line with the guidance given in BS8233, the lowest practicable external noise levels will be achieved. The layout of the development is well considered from an acoustic point of view, with protection offered to the gardens by the positioning of the buildings and overall site layout design.

5.7 Ground-borne vibration levels at the site have been qualitatively assessed and are considered to be acceptable for the development.

5.8 In summary of the above it is our view that the site is suitable for the development in terms of noise and vibration levels.

Appendix 1 Proposed Site Layout

CALA HOMES

Illustrative Layout Plan
Roman Road, Ingatestone
A2318 / SK08
Scale 1:500 @ A3 March 2016

CSP ARCHITECTURE

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on A12 and Roman Road. Vibration levels at the site were low.

Survey Period:

11/02/2016 to 12/02/2016

Survey Objectives:

- To identify noise and vibration sources that contribute to ambient noise levels at the site;
- To measure noise and vibration levels around the site over a typical day and night-time period.

Equipment Used:

Type	Manufacturer	Model	Serial Number
Sound level meter[1]	Bruel & Kjaer	2250	2630237
Calibrator	Bruel & Kjaer	4231	2115551
Sound level meter[1] (noise logger)	Rion	NL-32	00530374

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Free-field. 15m from Roman Road
N2	Attended noise monitoring position. 1.5m above ground. Free-field. 15m from Roman Road
L1	Unattended noise logging position. 1.5m above ground level. 15m from A12

Site Plan showing Measurement Positions:

Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmax, dB	LA90, dB	Observations
12.02.16	N1	11:58	5 mins	60	72	54	Noise levels dictated by constant road traffic on the A12 and more occasional road traffic on the other adjacent roads. Train passes and horns were occasionally audible from the railway lines to the east of the site however did not contribute to overall noise levels.
12.02.16	N1	12:04	5 mins	60	70	55	
12.02.16	N1	12:13	5 mins	60	67	55	
12.02.16	N2	12:21	5 mins	59	67	52	
12.02.16	N2	12:26	5 mins	59	68	54	
12.02.16	N2	12:32	5 mins	59	71	53	
12.02.16	N1	12:39	5 mins	60	68	52	
12.02.16	N1	12:45	5 mins	59	71	52	
12.02.16	N1	12:51	5 mins	59	66	53	
12.02.16	N2	12:58	5 mins	60	70	55	
12.02.16	N2	13:06	5 mins	59	68	53	
12.02.16	N2	13:12	5 mins	60	70	54	

Unattended Noise

Monitoring Summary:

Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB[1]	LAeq,8hr, dB	LA90,5mins, dB[1]	LAmax, dB[2]
11.02.16 to 12.02.16	L1	73	69	69	55	78

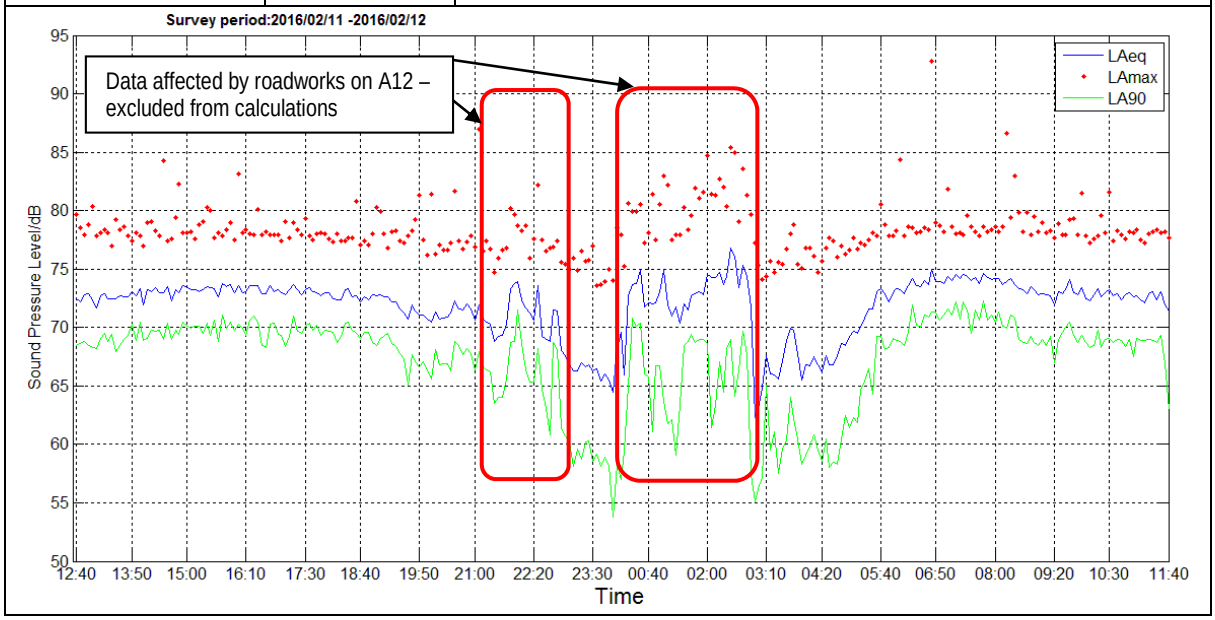
Note 1: Lowest measured during the period shown.

Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise

Monitoring Graphs:

Meas. Period	Position
11.02.16 to 12.02.16	L1



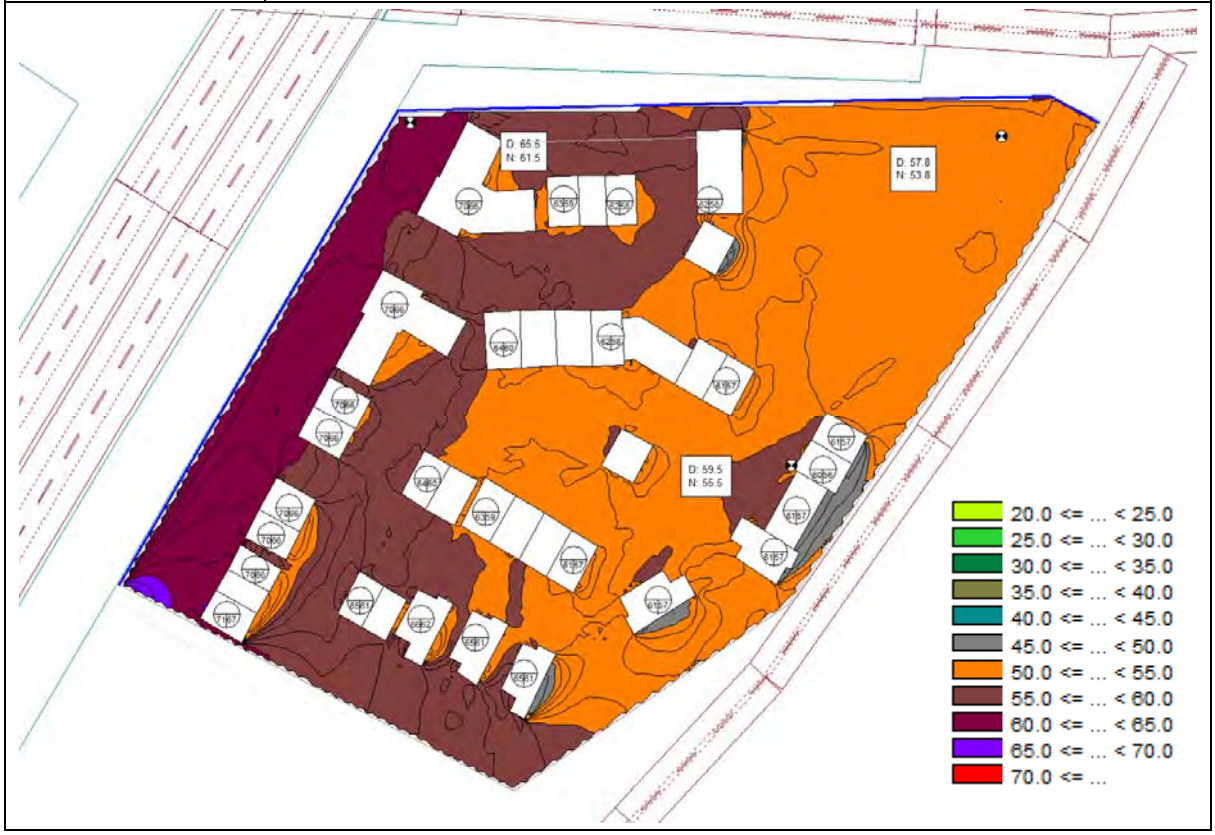
Appendix 3 Modelling Results

Modelling Software:	CADNA/A Version 4.6
Modelled Scenarios:	Day and night-time average noise levels across the site
Data inputs:	• Noise survey results • Topographical data for the site • Proposed development layout
Calculation Algorithms Used:	• Calculation of Road Traffic Noise 1988 – Department of Transport • ISO 9613-1:1993 Acoustics-Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere • ISO 9613-2:1996 Acoustics-Attenuation of sound during propagation outdoors – Part 2: General method of calculation

Modelling Printouts:

Scenario	Daytime noise levels (LAeq,16hr) at 1.2m above ground level

Scenario	Night-time noise levels (LAeq,8hr) at 1.5m above ground level

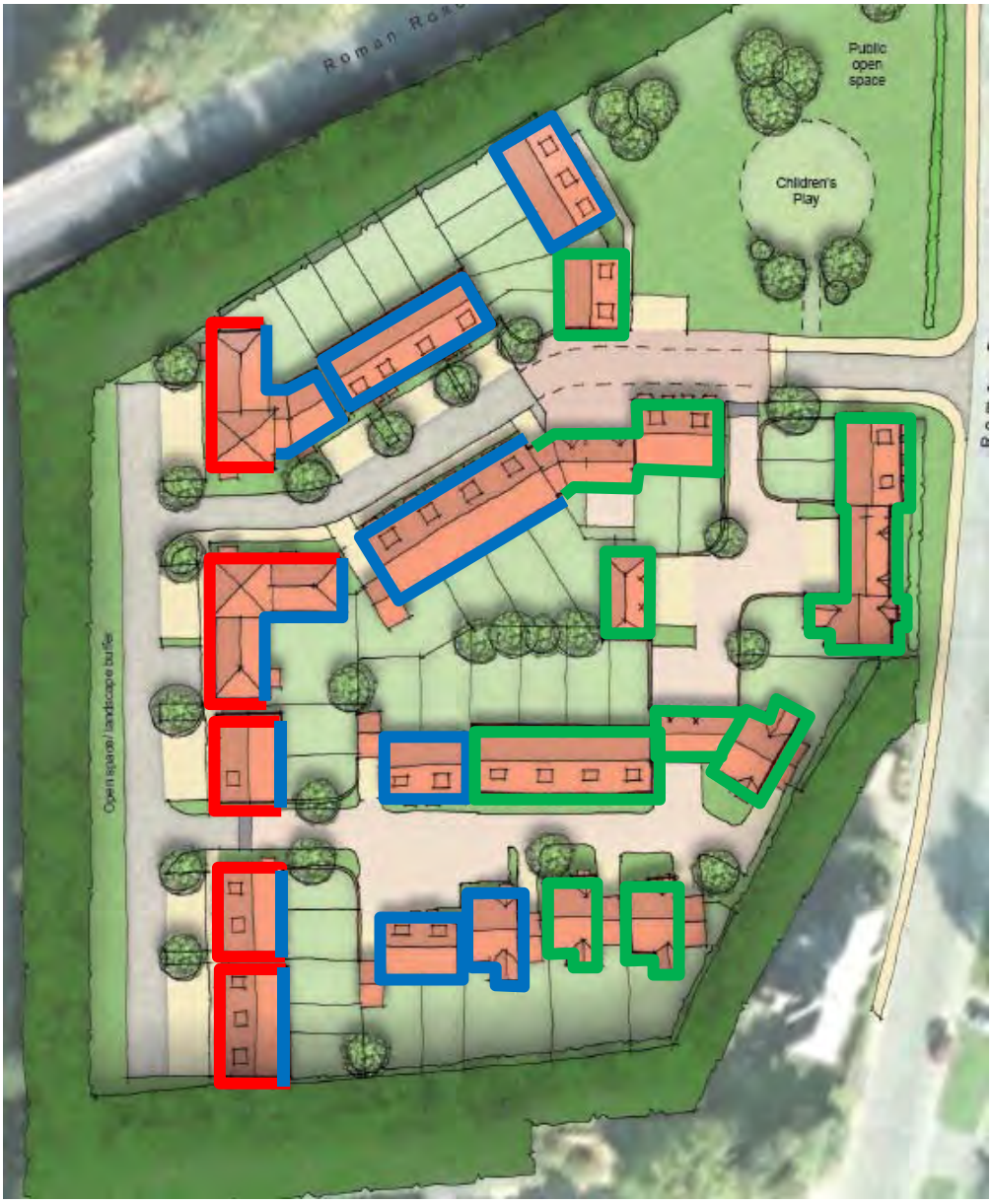


Appendix 4 Outline Acoustic Facade Specification

Reference	Colour	Glazing Specification	Ventilator Specification
FC01		40 dB Rw+Ctr	N/A
FC02		38 dB Rw + Ctr	42 dB Dnew
FC03		33 dB Rw+Ctr	40 dB Dnew

NOTES: Values must include the Ctr correction. Manufacturers or suppliers should provide laboratory test data demonstrating that the proposed systems are capable of achieving the values given. Windows should be tested as complete systems (rather than just the glazing in isolation).

All floors:



Appendix 5 FACSIM v2.7 Façade Modelling

FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

CLIENT:	CALA HOMES LTD
PROJECT:	ROMAN ROAD, INGATESTONE
ROOM:	Bedroom
RUN REF:	FC01
VARIANT:	Night LAmax

Room Dimensions [m] W 4.0 X L 3.0 X H 2.4

Room Volume = 28.4 m3
Partition Area = 9.5 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>> Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	78.0	61.7	64.9	68.4	70.7	73.9	70.2	66.3	
Road traffic spectrum (according to BS 8233:1999 section 6)		61.7	64.9	68.4	70.7	73.9	70.2	66.3	**Direct input**

REVERBERATION TIME

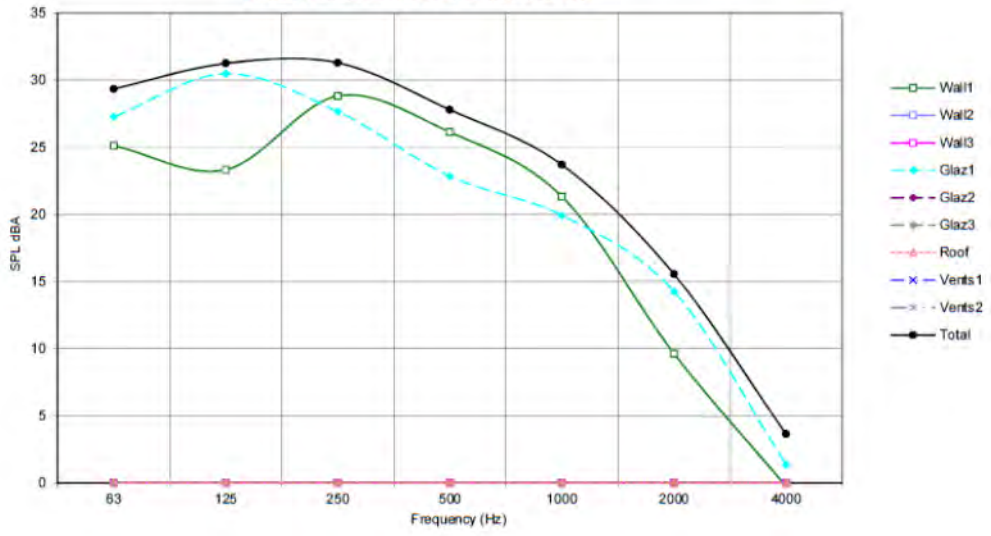
DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	39	44	42	47	55	63	69	42%	53	0	0
ATTENUATION			0	0	0	0	0	0	0	0%			
Wall 2	WALLS												
ATTENUATION			0	0	0	0	0	0	0	0%			
Wall 3	WALLS												
ATTENUATION			0	0	0	0	0	0	0	0%			
Glazing 1	40 dB Rw + Ctr - Very High Performance Double Glazing - SEE NOTE 1	1.5	30	30	36	43	49	51	60	58%	40 (inc Ctr)	-	-
ATTENUATION			0	0	0	0	0	0	0	0%			
Glazing 2	GLAZING												
ATTENUATION			0	0	0	0	0	0	0	0%			
Glazing 3	GLAZING												
ATTENUATION			0	0	0	0	0	0	0	0%			
Roof	ROOF / FLOOR												
ATTENUATION			0	0	0	0	0	0	0	0%			
Resultant composite Façade SRI			36	37	40	46	53	58	66				
Resultant SPL inside room excluding ventilators dB		36.5	29	31	31	28	24	16	4	100%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	VENTS	0	0	0	0	0	0	0	0	0%			
ATTENUATION			0	0	0	0	0	0	0	0%			
Ventilation	VENTS												
ATTENUATION			0	0	0	0	0	0	0	0%			
Resultant SPL inside room through ventilators dB		-99.0	-96	-96	-96	-96	-96	-96	-96	0%			

Total SPL inside room	**36.5**	29	31	31	28	24	16	4

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

			W		L		H
CLIENT:	CALA HOMES LTD	Room Dimensions [m]	4.0	X	3.0	X	2.4
PROJECT:	ROMAN ROAD, INGATESTONE						
ROOM:	Bedroom	Room Volume =	28.4	m3			
RUN REF:	FC01	Partition Area =	9.5	m2			
VARIANT:	Night LAeq	Ventilation ref area =	10.0	m2			
	SELECT Free Field or Façade SPL for model input >>>	Free Field SPL K =	3	dB			

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								**No data**
Road traffic spectrum (according to BS 8233:1999 section 6)	70.0								
		51.8	55.9	59.4	62.8	66.0	63.2	58.0	**Reference spectrum**

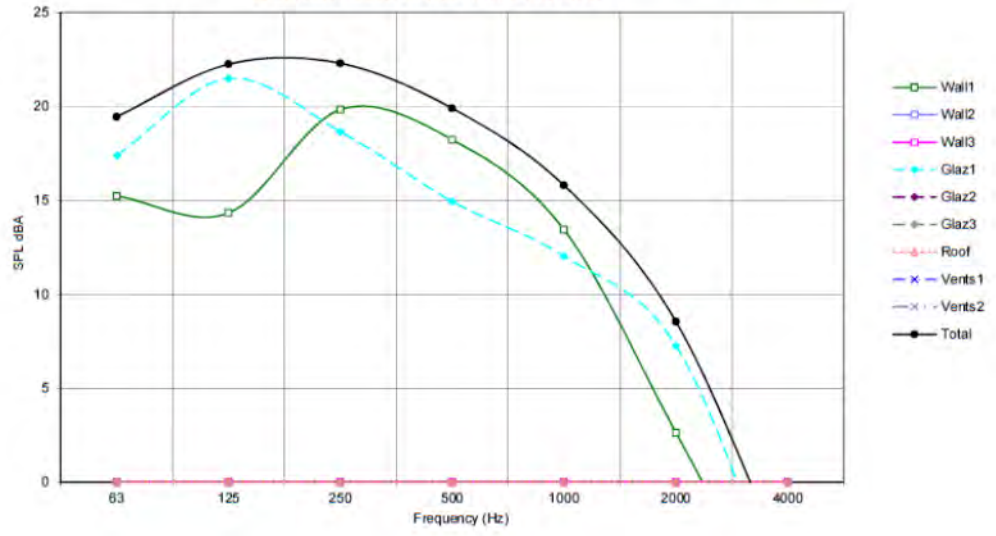
REVERBERATION TIME

DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	39	44	42	47	55	63	69	43%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	40 dB Rw + Ctr - Very High Performance Double Glazing - SEE NOTE 1	1.5	30	30	36	43	49	51	60	56%	40 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		36	37	40	46	53	58	66				
	Resultant SPL inside room excluding ventilators dB	27.5	19	22	22	20	16	9	-5	100%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	VENTS	0	0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	-99.0	-96	-96	-96	-96	-96	-96	-96	0%			
	Total SPL inside room	**27.5**	19	22	22	20	16	9	-5				

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

CLIENT:	CALA HOMES LTD
PROJECT:	ROMAN ROAD, INGATESTONE
ROOM:	Living Room
RUN REF:	FC01
VARIANT:	Day LAeq

Room Dimensions [m]: W 4.0 X L 4.0 X H 2.4

Room Volume = 37.9 m3
Partition Area = 17.0 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>>
Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								**No data**
Road traffic spectrum (according to BS 8233:1999 section 6)	74.0								
		55.8	59.9	63.4	66.8	70.0	67.2	62.0	**Reference spectrum**

REVERBERATION TIME

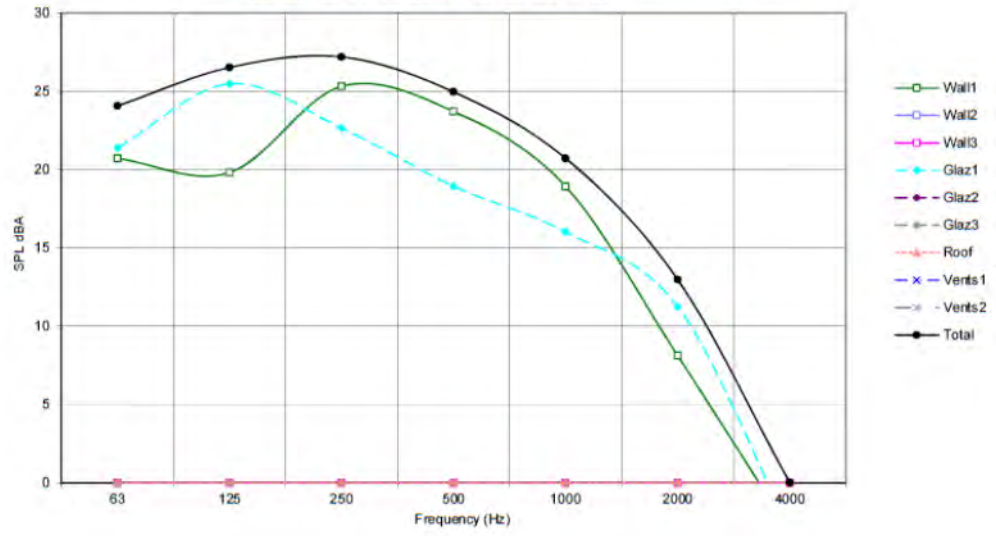
DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	15.0	39	44	42	47	55	63	69	52%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	40 dB Rw + Ctr - Very High Performance Double Glazing - SEE NOTE 1	2.0	30	30	36	43	49	51	60	48%	40 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		36	38	41	46	54	59	66				
	Resultant SPL inside room excluding ventilators dB	32.3	24	27	27	25	21	13	0	100%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	-99.0	-96	-96	-96	-96	-96	-96	-96	0%			

Total SPL inside room	**32.3**	24	27	27	25	21	13	0

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

			W		L		H
CLIENT:	CALA HOMES LTD	Room Dimensions [m]	4.0	X	3.0	X	2.4
PROJECT:	ROMAN ROAD, INGATESTONE						
ROOM:	Bedroom	Room Volume =	28.4	m3			
RUN REF:	FC02	Partition Area =	9.5	m2			
VARIANT:	Night LAmax	Ventilation ref area =	10.0	m2			
	SELECT Free Field or Façade SPL for model input >>>	Free Field SPL K =	3	dB			

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	74.0	57.7	60.9	64.4	66.7	69.9	66.2	62.3	
Road traffic spectrum (according to BS 8233:1999 section 6)									
		57.7	60.9	64.4	66.7	69.9	66.2	62.3	**Direct input**

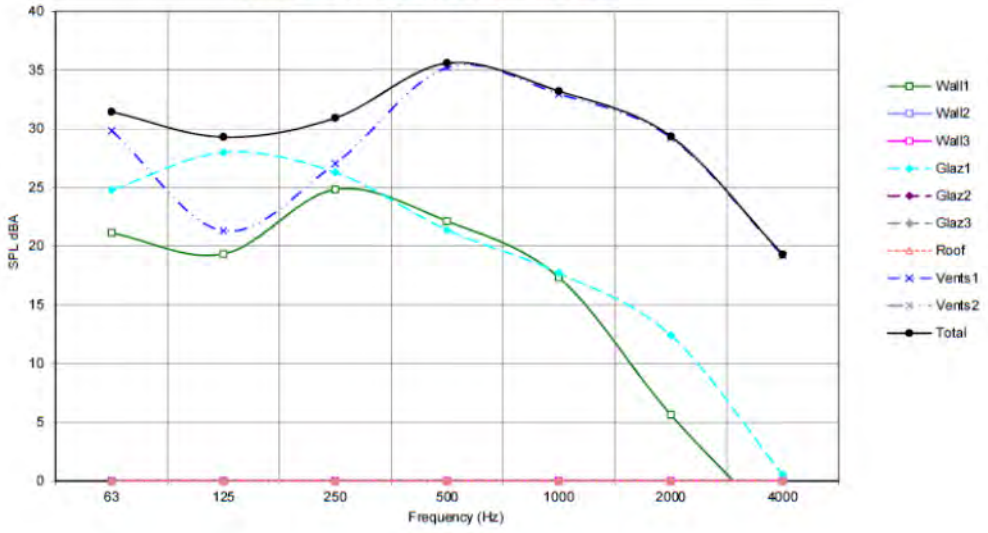
REVERBERATION TIME

DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	39	44	42	47	55	63	69	7%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	38 dB Rw + Ctr - Very High Performance Double Glazing	1.5	28	28	33	40	47	49	57	15%	38 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		35	36	39	45	53	56	64				
	Resultant SPL inside room excluding ventilators dB	33.6	26	29	29	25	21	13	2	23%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Passivent AL-dB 800 Air supply window vent	2	34	46	44	38	43	43	50	77%	42	0	0
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	38.9	30	21	27	35	33	29	19	77%			
	Total SPL inside room	**40.1**	31	29	31	36	33	29	19				

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

			W		L		H
CLIENT:	CALA HOMES LTD	Room Dimensions [m]	4.0	X	3.0	X	2.4
PROJECT:	ROMAN ROAD, INGATESTONE						
ROOM:	Bedroom	Room Volume =	28.4	m3			
RUN REF:	FC02	Partition Area =	9.5	m2			
VARIANT:	Night LAeq	Ventilation ref area =	10.0	m2			
	SELECT Free Field or Façade SPL for model input >>>	Free Field SPL K =	3	dB			

NOTES:

EXTERNAL SPECTRUM (A weighted)	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								**No data**
Road traffic spectrum (according to BS 8233:1999 section 6)	62.0								
		43.8	47.9	51.4	54.8	58.0	55.2	50.0	**Reference spectrum**

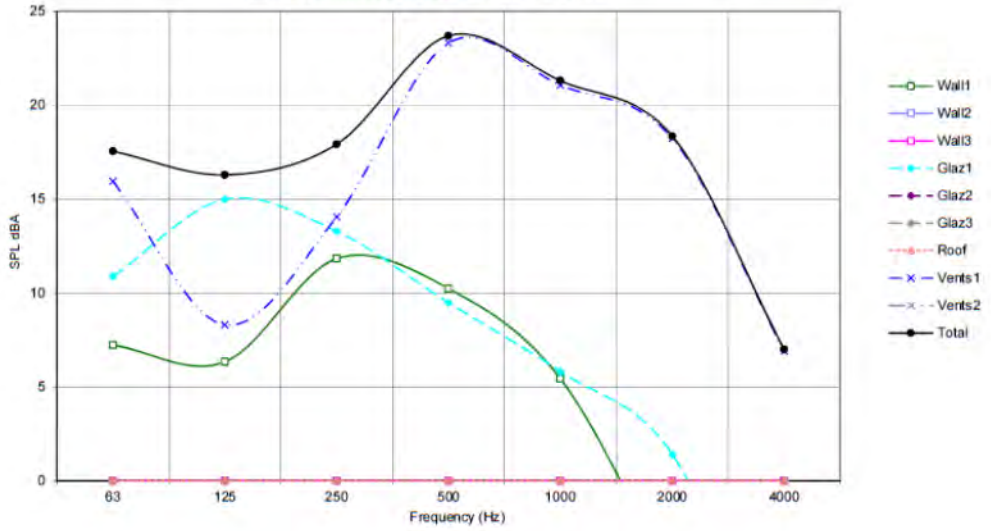
REVERBERATION TIME								
DIRECT INPUT ---->								**No data**
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	39	44	42	47	55	63	69	6%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	38 dB Rw + Ctr - Very High Performance Double Glazing	1.5	28	28	33	40	47	49	57	13%	38 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		35	36	39	45	53	56	64				
	Resultant SPL inside room excluding ventilators dB	20.7	12	16	16	13	9	2	-11	20%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Passivent AL-dB 800 Air supply window vent	2	34	46	44	38	43	43	50	80%	42	0	0
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	26.9	16	8	14	23	21	18	7	80%			

Total SPL inside room	**27.8**	18	16	18	24	21	18	7

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

CLIENT:	CALA HOMES LTD
PROJECT:	ROMAN ROAD, INGATESTONE
ROOM:	Living Room
RUN REF:	FC02
VARIANT:	Day LAeq

Room Dimensions [m]: W 4.0 X L 4.0 X H 2.4

Room Volume = 37.9 m3
Partition Area = 17.0 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>>
Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)	67.0								
		48.6	52.9	56.4	59.6	63.0	60.2	55.0	Reference spectrum

REVERBERATION TIME

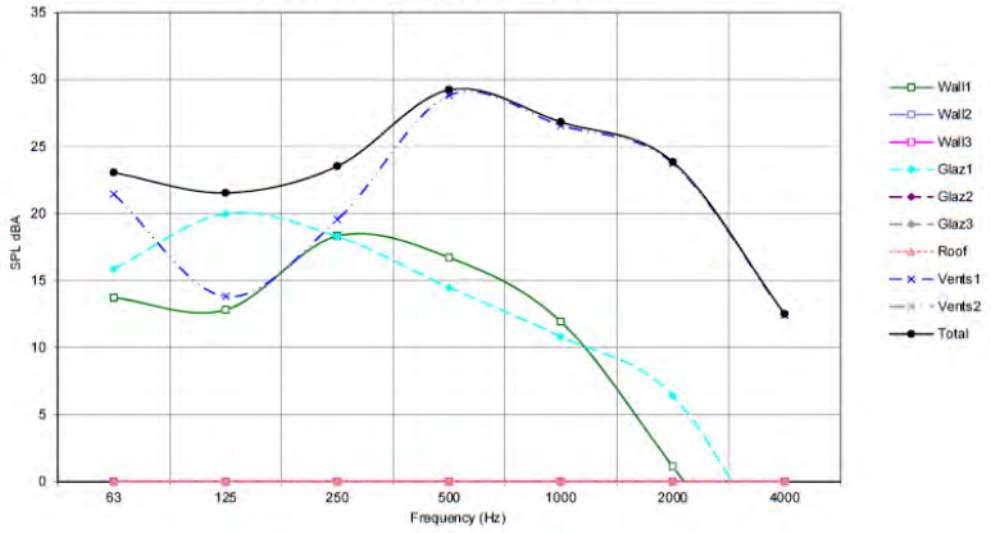
DIRECT INPUT ---->								No data
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	15.0	39	44	42	47	55	63	69	8%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	38 dB Rw + Ctr - Very High Performance Double Glazing	2.0	28	28	33	40	47	49	57	12%	38 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		35	37	40	46	53	57	65				
	Resultant SPL inside room excluding ventilators dB	26.3	18	21	21	19	14	8	-5	20%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Passivent AL-dB 800 Air supply window vent	3	34	46	44	38	43	43	50	80%	42	0	0
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	32.4	21	14	20	29	27	24	12	80%			

Total SPL inside room	**33.3**	23	22	24	29	27	24	12

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

CLIENT:	CALA HOMES LTD
PROJECT:	ROMAN ROAD, INGATESTONE
ROOM:	Bedroom
RUN REF:	FC03
VARIANT:	Night LAmax

Room Dimensions [m] W 4.0 X L 3.0 X H 2.4

Room Volume = 28.4 m3
Partition Area = 9.5 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>>
Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ——>	70.0	53.7	56.9	60.4	62.7	65.9	62.2	58.3	
Road traffic spectrum (according to BS 8233:1999 section 6)									
		53.7	56.9	60.4	62.7	65.9	62.2	58.3	**Direct input**

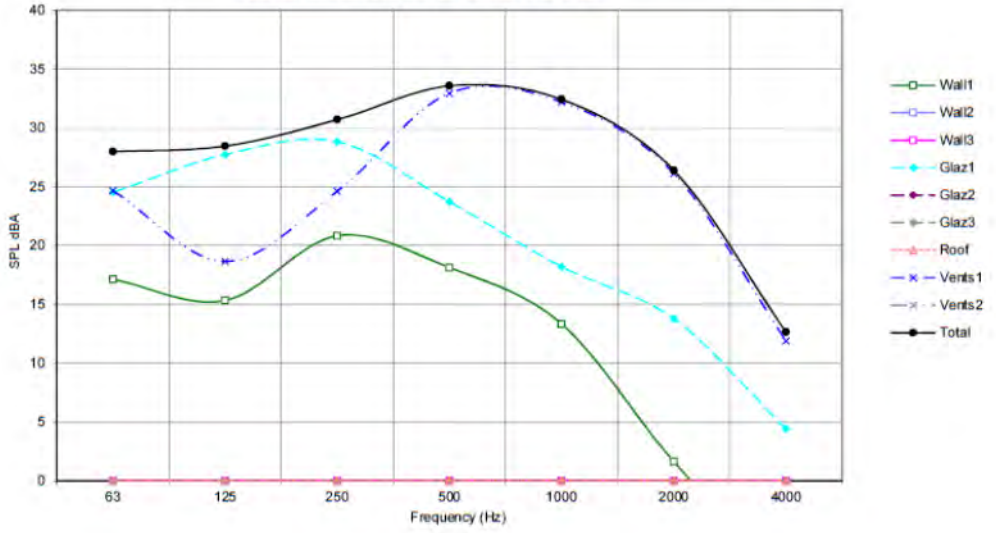
REVERBERATION TIME

DIRECT INPUT ——>								**No data**
EQUAL RT for all bands ——>								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**Default - RT set to 0.5s**

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	39	44	42	47	55	63	69	4%	53	0	0
ATTENUATION													
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION													
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION													
Glazing 1	33 dB Rw + Ctr - High Acoustic Performance Double Glazing	1.5	24	24	27	34	43	44	49	28%	33 (inc Ctr)	-	-
ATTENUATION													
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION													
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION													
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION													
	Resultant composite Façade SRI		32	32	34	41	50	51	57				
	Resultant SPL inside room excluding ventilators dB	33.5	25	28	29	25	19	14	5	32%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Passivent AL-dB 450 Air supply window vent	2	35	45	42	36	40	42	53	68%	40	0	0
ATTENUATION													
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION													
	Resultant SPL inside room through ventilators dB	36.7	25	19	25	33	32	26	12	68%			
	Total SPL inside room	**38.4**	28	28	31	34	32	29	13				

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

CLIENT:	CALA HOMES LTD
PROJECT:	ROMAN ROAD, INGATESTONE
ROOM:	Bedroom
RUN REF:	FC03
VARIANT:	Night LAeq

Room Dimensions [m]: W 4.0 X L 3.0 X H 2.4

Room Volume = 28.4 m3
Partition Area = 9.5 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>>
Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)	59.0								
		40.6	44.9	48.4	51.8	55.0	52.2	47.0	Reference spectrum

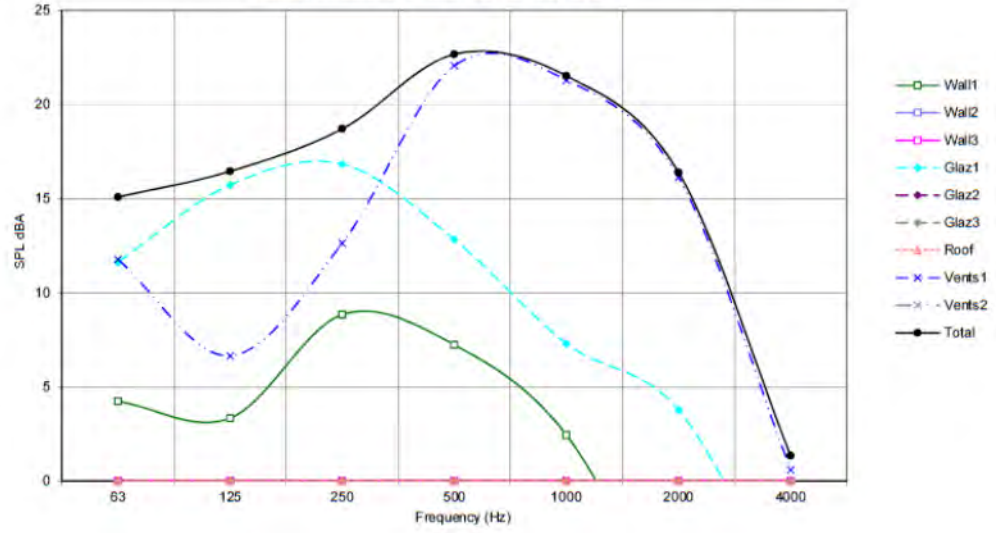
REVERBERATION TIME

DIRECT INPUT ---->								No data
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	39	44	42	47	55	63	69	4%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	33 dB Rw + Ctr - High Acoustic Performance Double Glazing	1.5	24	24	27	34	43	44	49	24%	33 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		32	32	34	41	50	51	57				
	Resultant SPL inside room excluding ventilators dB	21.7	12	16	17	14	9	4	-7	28%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Passivent AL-dB 450 Air supply window vent	2	35	45	42	36	40	42	53	71%	40	0	0
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	25.7	12	7	13	22	21	16	1	72%			
	Total SPL inside room	**27.2**	15	16	19	23	22	16	1				

Element contribution to total internal noise level



FACSIM V2.7.1 - MODELLING OF FACADE ACOUSTIC INSULATION TO BS12354-3 and BS8233

CLIENT:	CALA HOMES LTD
PROJECT:	ROMAN ROAD, INGATESTONE
ROOM:	Living Room
RUN REF:	FC03
VARIANT:	Day LAeq

Room Dimensions [m]: W 4.0 X L 4.0 X H 2.4

Room Volume = 37.9 m3
Partition Area = 17.0 m2
Ventilation ref area = 10.0 m2
SELECT Free Field or Façade SPL for model input >>>
Free Field SPL K = 3 dB

NOTES:

EXTERNAL SPECTRUM (A weighted)

	dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ---->	-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)	63.0								
		44.8	48.9	52.4	55.8	59.0	56.2	51.0	Reference spectrum

REVERBERATION TIME

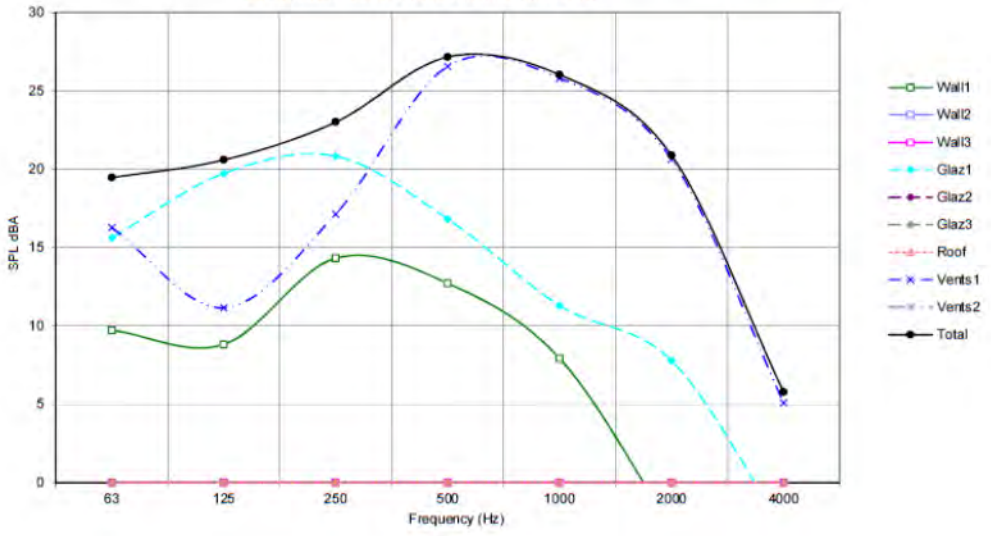
DIRECT INPUT ---->								No data
EQUAL RT for all bands ---->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	15.0	39	44	42	47	55	63	69	5%	53	0	0
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	33 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.0	24	24	27	34	43	44	49	22%	33 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant composite Façade SRI		33	33	35	42	51	53	58				
	Resultant SPL inside room excluding ventilators dB	25.9	17	20	22	18	13	8	-3	27%			

Ventilator Type		Num	$D_{n,e}$ dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation	Passivent AL-dB 450 Air supply window vent	3	35	45	42	36	40	42	53	73%	40	0	0
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
	Resultant SPL inside room through ventilators dB	30.3	16	11	17	27	26	21	5	73%			

Total SPL inside room	**31.6**	19	21	23	27	26	21	6

Element contribution to total internal noise level



Appendix 6

Ethos Environmental Planning

Ecological Assessment

Land to the West of Roman Road, Ingatestone

October 2015

Ethos Environmental Planning
Studio 11a Greenway Farm
Wick
Bristol
BS30 5RL

[redacted]

CONTENTS

1.0 INTRODUCTION

Ethos Environmental Planning (Ethos) have undertaken this ecological assessment of land to the West of Roman Road, Ingatestone (central grid reference: TQ 63991 98709).

1.1 Aims and objectives of the appraisal

The assessment has been informed by guidelines provided in the *'CIEEM Guidelines for Ecological Report Writing, 2015'.* Further guidance in relation to surveys for protected species are detailed in the relevant sections within this report. The survey has the following objectives:

- to identify the existing habitats on site;
- to assess the potential and presence of notable species;
- to establish baseline conditions and determine the importance of ecological features present (or those that could be present) within the specified area;
- to establish any requirements for further surveys or licensing;
- to identify key constraints to the project and make recommendations for design options to avoid significant effects on important ecological features/resources;

1.2 Site location

The site is located in the south west of the town of Ingatestone, approximately 5 miles north east of Brentwood. The site is surrounded by roads - the Ingatestone By-Pass (A12) is directly adjacent to the western boundary and Roman Road is adjacent to the northern and eastern boundaries. There is also a Cul-de-sac adjacent to the southern boundary, with housing beyond this and to the east of the site.

Figure 1 Site location

1.3 Development Proposals

The emerging development proposals include the construction of up to 57 units, which includes houses and apartments. The development plans also include associated gardens, parking spaces, access road and public open space. Vegetation on the northern, southern and western boundaries is being retained.

Figure 2 Illustrative layout plan

1.4 Structure of the report

The following is included within this report:

- Legislative and planning context.
- Methodology;
- Background data search;
- Phase 1 habitat survey;
- Assessment for protected species;
- Discussion
- Conclusions; and
- Recommendations.

2.0 LEGISLATIVE AND POLICY CONTEXT

This section provides a summary of the legislative and planning context which has been used to inform the ecological assessment and subsequent recommendations made in this report. Appendix 1 sets out further details in relation to the most relevant legislation and policy.

2.1 Legislation

The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all the directive protects over 1,000 animals and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance.

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Badgers and their setts are protected under the **Protection of Badgers Act 1992** as amended by the Hunting Act 2004.

The **Natural Environment and Rural Communities Act 2006** (the NERC act) places a duty on all public authorities, including local planning authorities, to consider biodiversity in their work. Local planning authorities are to ensure that there is no net loss of biodiversity on a site, no net loss in habitat connectivity and aims to enhance biodiversity.

The **Hedgerows Regulations 1997** protect 'important hedgerows' from being removed (uprooted or destroyed). Hedgerows are protected if they are at least 30 years old and meet at least one of the criteria listed in part II of schedule 1.

Specific legislation related to different species such as bats, birds and reptiles is outlined in appendix 1.

2.2 Policy

The **National Planning Policy Framework (NPPF)** aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including the establishment of coherent ecological networks more resilient to current and future pressures.

The **UK Biodiversity Action Plan (UK BAP)** sets out a programme for conserving the UK's biodiversity. It led to the production of 436 action plans between 1995 and 1999 to help many of the UK's most threatened species and habitats to recover. A review of the UK BAP priority list in 2007 led to the identification of 1,150 species and 65 habitats that meet the BAP criteria at UK level.

Local policy

The Brentwood Borough Council Local Plan (adopted August 2005) sets out a number of policies for conservation and the protection of the natural environment. The following highlights the key policy from this document and assesses the development proposals against it.

C1 – Sites of Special Scientific Interest

C3 - County Wildlife Sites, Local Nature Reserves and Other Habitats and Natural Features of Local Value

C5 – Retention and provision of landscaping and natural features in development

3.0 METHODOLOGY

3.1 Phase 1 habitat survey

The phase 1 habitat survey and mapping has drawn on guidance provided in the *Handbook for Phase 1 Habitat Survey - a technique for environmental audit* (JNCC 2010). The survey was undertaken on the 23rd September 2015 by the survey team (see section 3.4 below). The survey incorporated detailed assessment of the land within the development boundary, including a description and mapping of all key features and habitat types. The survey was carried out to identify the range of habitats within the site and the predominant and notable species of flora. All hedgerows on site were assessed using the *Hedgerow Survey Handbook: A standard procedure for local surveys in the UK (defra, 2007)* as a guide.

3.2 Background data search

A data search was obtained from The Essex Biological and Geological Records Centre Service - The Essex Field Club. A search radius of 1km was requested. Information on Local Wildlife Sites could not be provided as part of this search, and therefore the Brentwood Borough Local Wildlife Site Review (2012) was consulted.

3.3 Protected Species

The assessment has considered the potential for protected species drawing on information gathered from the background data search and an assessment of habitat suitability. Further details on the methodology used is outlined in section 6.

3.4 Personnel

The survey was led by Jim Phillips, BSc (Hons), MA, MCIEEM who was assisted by Kate Spencer, BSc (Hons). Jim is a Director of Ethos and a qualified and experienced ecologist with over 8 year's field work experience and a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Kate is a qualified ecologist with over 3 years' experience. The survey team have worked together on numerous similar projects and have a complimentary range of skills and experience which are considered to have provided a robust ecological appraisal of the site.

3.5 Limitations

The surveys were carried out in September 2015, which is within the optimal period for undertaking Phase 1 Habitat Surveys. The vegetation in the field was dense and overgrown and it was not possible to access all areas of the site. Overall, it was assessed that this limitation did not affect the results of the survey and the conclusions are robust.

4.0 BACKGROUND DATA REVIEW

4.1 Notable Sites

There are no designated sites within a 1km radius.

The following statutory designated sites (Sites of Special Scientific Interest and Local Nature Reserves) are located approximately 5km from the site (with the exception of Hutton Country Park):

- Hanningfield Reservoir SSSI – The second largest reservoir in Essex with nationally important numbers of breeding and wintering wildfowl including Gadwall.
- Mill Meadows SSSI and LNR, Billericay – Notified for its unimproved neutral grassland.
- Norsey Wood SSSI and LNR – a large mixed chestnut coppice derived from acid oak woodland. Ancient woodland with springs and flushes and a good variety of habitats, a rich flora and fauna and is one of the best woods of its type in Essex.
- The Coppice SSSI, Kelvedon Hatch – Ancient semi-natural broad-leaved wood with base-rich springline Alder woodland and Oak-Hornbeam Woodland.
- Galleywood Common LNR – dominated by low growing shrubs, heathers and grasses with wetland and scrub habitats.
- Hutton Country Park LNR (approximately 3km from the site) – grassland, ancient woodland, ponds, wetland and River Wid. Supports a diversity of native wildlife in an area otherwise dominated by arable land and urban expansion.

The Ancient Woodland Inventory shows one woodland (Lodge Wood) within 1km of the site (approx. 700m to the south east).

The Brentwood Borough Local Wildlife Site (LWS) Review document (2012) did not identify any LWS's on or adjacent to the site.

4.2 Notable Species

Protected and notable species records returned within a 1km radius are:

Water vole *(Arvicola amphibious)*
Hazel Dormouse *(Muscardinus avellanarius)*
Badger *(Meles meles)*
Bats – Daubentons *(Myotis daubentonii)*, Common Pipistrelle *(Pipistrellus pipistrellus)* and Pipistrelle sp.
Reptiles – Adder *(Vipera berus)* and Grass Snake *(Natrix natrix)*
Hedgehog (*Erinaceus europaeus)*
Common Toad *(Bufo bufo)*

4.3 Relevance of the background data search

4.3.1 Notable Sites

The site is significantly isolated from all designated and local wildlife sites by the surrounding infrastructure: the A12 along the west, Roman Road along the north and east and a cul-de-sac and housing to the south. Therefore, it is assessed that changes to the proposed site will have negligible effects on any notable sites.

4.3.2 Notable Species

Considering the habitats present on the proposed site (hedgerows/scrub and tall ruderals), the most significant nearby protected species records are bats, dormouse, badger, reptiles, hedgehog and common toad.

5.0 PHASE 1 HABITAT SURVEY

5.1 General site description

The site is located off Roman Road in the south west of Ingatestone. The wider environment is predominantly farmland to the north and west (separated by busy roads – the A12 and Roman Road), with residential housing to the east and south (again, separated by roads). There is an area of woodland approximately 100m to the north east of the site and a small area of amenity grassland and trees adjacent to the eastern boundary (both are separated by roads). The site is approximately 1.39ha in size and is screened by mature hedgerows. The field interior is deeply furrowed from ploughing (possibly within the last 2-3 years), and has been colonised by tall ruderal plants.

5.2 Habitat description

Figure 3 shows the key habitats using the phase 1 habitat classifications. The key features described within this section are:

- Hedgerows
- Tall ruderal

Figure 3 Phase 1 Habitats on site

5.2.1 Hedgerows

Photograph 1: Boundary hedgerow

Photograph 2: Boundary hedgerow

The site is surrounded to the north, west and south by mature moderately species rich hedgerows consisting of abundant common hawthorn *(Crataegus monogyna)*, blackthorn *(Prunus spinosa)*, oak sp. *(Quercus sp.)* and occasional field maple *(Acer campestre)*, hazel *(Corylus avellana)*, ash *(Fraxinus excelsior)*, hornbeam *(Carpinus betulus),* apple sp. *(Malus sp.)*, rose sp. *(Rosa sp.)*, cherry sp. *(Prunus sp.)*, goat willow *(Salix caprea)* and crack willow *(Salix fragilis).*

5.2.2 Tall ruderals

Photograph 3: Tall ruderal

Photograph 4: Tall ruderal

The field interior was deeply furrowed from ploughing and was colonised by tall ruderal plant species (plants that are first to colonise disturbed land). Abundant species were spear thistle (Cirsium vulgare) and common fleabane *(Pulicaria dysenterica) with frequent willow herb sp. (Epilobium sp.), ragwort (Senecio jacobaea),* yarrow *(Achillea millefolium),* Michaelmas daisy *(Aster pyrenaeus), bristly ox-tongue (Helminthotheca echioides),* cocks foot *(Dactylis glomerata)*, meadow buttercup (*Ranunculus acris)*, perennial rye grass *(Lolium perenne)* and teasel *(Dipsacus fullonum)*. Occasional species included oxeye daisy *(Leucanthemum vulgare)*, ribwort plantain *(Plantago lanceolate)*, greater plantain *(Plantago major)*, self-heal *(Prunella vulgaris)* and creeping cinquefoil *(Potentilla reptans).*

6.0 ASSESSMENT FOR PROTECTED SPECIES

The background data search and phase 1 habitat assessment have been used to inform the assessment for protected species outlined in the following sections.

6.1 Methodology

6.1.1 Badger (and other terrestrial mammals)

The survey for badgers included a search of the development site for any evidence of badgers, including setts, foraging signs (snuffle holes), runs and latrines.

6.1.2 Hedgehog

There is no standardised survey technique for this BAP species however, hedgerows and other habitats within the site were assessed for their potential to support hedgehogs, and visually for evidence of hedgehogs themselves or their droppings.

6.1.3 Hazel dormouse

The survey included an assessment of the potential of the site for hazel dormice, focusing on the connectivity and suitability of the habitat on site, as well as a search for nuts with evidence of hazel dormouse feeding signs.

6.1.4 Amphibians

The habitats on site were assessed for their potential to support amphibian species, including great crested newts (GCN) *Triturus cristatus*. Surveys for GCN were informed by the *Great Crested Newt Conservation Handbook,* Froglife 2001. The site was examined for suitable waterbodies and for breeding terrestrial habitat. In addition to the on site assessment, a desktop analysis of ponds within 500 metres of the site was undertaken, to identify any potential breeding ponds which may require further survey.

6.1.5 Birds

Due to the small size of the site, and the habitats present, it was not considered necessary to conduct targeted breeding bird surveys.

6.1.6 Invertebrates

Due to the many invertebrate groups that exist, the often large differences in invertebrate diversity between habitats and the many survey techniques available, invertebrate surveys are highly specific to the site in question. Therefore, an assessment of the potential site for invertebrates was undertaken, including the need for any targeted surveys.

6.1.7 Reptiles

An assessment of the habitats on site for their potential to support reptiles was undertaken, including the need for a reptile survey.

6.1.8 Bats

The habitats on site were assessed for their suitability for foraging and commuting bats and the potential for roosting bats, including the need for bat activity surveys in accordance with the Bat Conservation Trust *Bat Surveys Good Practice Guidelines 2012.*

6.2 Protected Species Survey Results

6.2.1 Badger

The background data search returned records of badger within 1km. The site survey found no evidence of badgers on site, therefore no further surveys or actions in relation to badgers are required.

6.2.2 Hedgehog

No evidence of hedgehogs was found on site, although habitat on site was assessed to be moderately suitable – with hedgerows providing habitat for shelter and foraging. The development proposals involve the retention of the majority of hedgerows, apart from a section of the defunct hedgerow along the eastern boundary where the site access is proposed. Recommendations in relation to this species are made in section 8.

6.2.3 Hazel dormouse

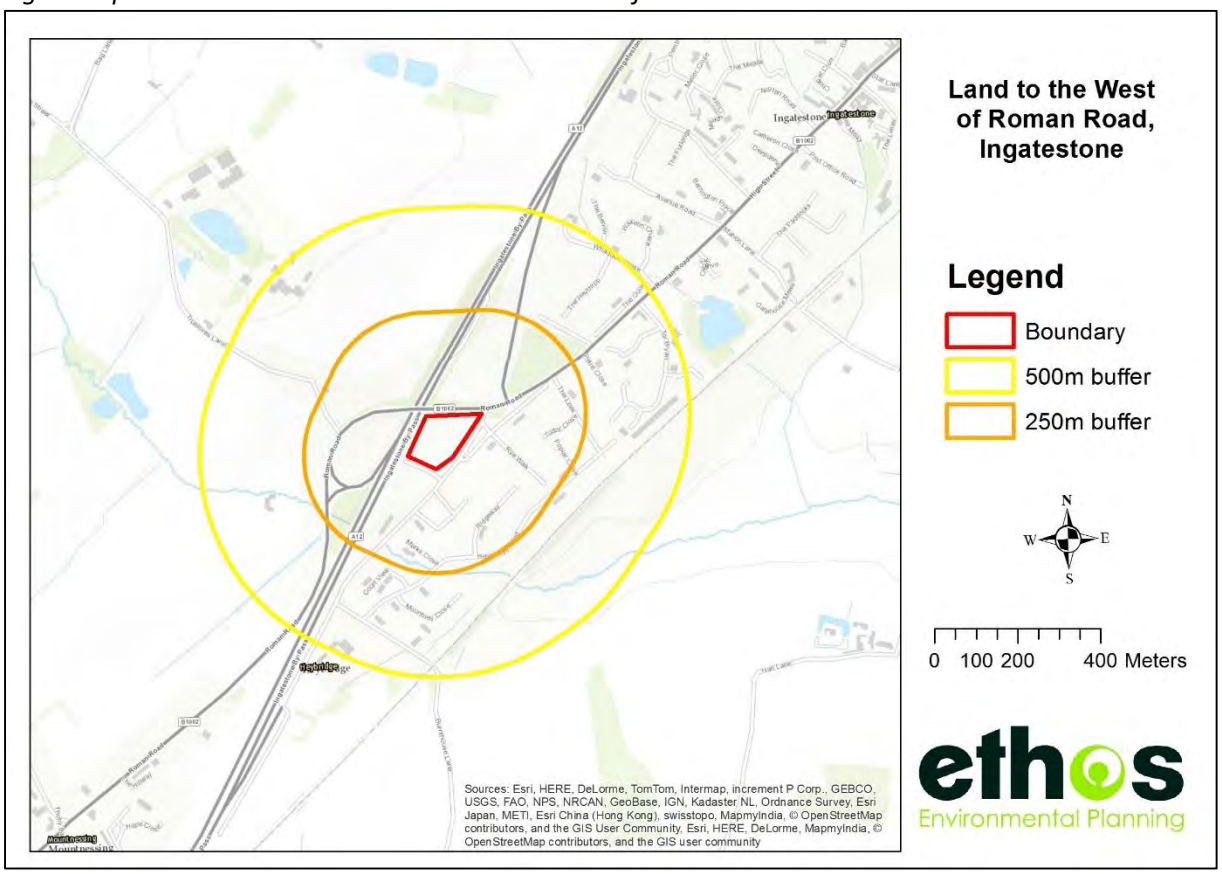
No evidence of hazel dormice was found on site. Although the data search returned records of hazel dormice within 1km of the site, the hedgerows on site are isolated from the surrounding hedgerow network and the nearby woodland by busy roads. It was therefore assessed that there was negligible potential for this species on site.

6.2.4 Great crested newt

There are no water bodies on site and therefore there is no breeding habitat on site for great crested newts. There is some limited potential terrestrial habitat for great crested newts and other common amphibian species along the hedgerows, however the site is isolated from surrounding habitat by roads.

There are no ponds located within 500 metres of the site. There is a stream (slow running streams may be used by GCN) within 250 metres, as shown on figure 4. As already discussed, the site is surrounded by significant barriers (busy roads) which means it is isolated from surrounding suitable habitat. The data research returned no records of GCN within 1km. It was therefore assessed that it is highly unlikely that GCN are present on site, and no further surveys are required.

Figure 4: ponds and waterbodies within 500 metres of the site



6.2.5 Birds

The hedgerows were assessed as providing potential habitat for nesting and foraging birds. Overall, it was assessed that the potential for the presence of breeding birds on site was high, and although no further surveys are required, recommendations in relation to protecting birds on site should be put in place.

6.2.6 Invertebrates

Hedgerows and tall ruderals can provide habitat for invertebrates. However, it was assessed that the limited extent of the habitat on site had minimal value for invertebrate species. Furthermore, as the majority of hedgerows on site are being retained with a landscape buffer adjacent to the A12, it is considered that no further survey of invertebrates is required.

6.2.7 Reptiles

Although the hedgerows could provide suitable shelter/hibernation habitat for reptiles, the tall ruderal habitat within the field interior has negligible potential for reptiles, with no areas for basking and evidence of being recently disturbed (ploughed). The data search returned records of grass snake and adder within 1km of the site, but the habitats on site are isolated from surrounding habitat by roads. It is therefore highly unlikely that reptiles are present on site.

6.2.8 Bats

6.2.8.1 Habitat

The boundary hedgerows could provide potential foraging and commuting habitat for bats on site. The trees within the hedgerows were all classified as Category 3 *Negligible potential for roosting bats* as they were all young and had no features suitable for roosting bats.

Development proposals include the retention of the hedgerows (except for part of the defunct hedgerow along the eastern boundary), with a landscape buffer alongside the A12, an area of public open space and gardens backing onto the hedgerows along the northern and southern boundaries. This will allow continued use of the site by foraging and commuting bats.

7.0 DISCUSSION

7.1 Habitats

Hedgerows are listed in section 42 of the NERC act 2006 as being a boundary and linear feature considered to be of Principle Importance for Nature Conservation. The hedgerows have been assessed as having moderate conservation value, as they are tall, thick and dense (with the exception of the defunct eastern hedgerow which has been assessed as having low conservation value), providing shelter, nesting habitat and foraging habitat (with species such as hawthorn and blackthorn providing flowers and fruits) for a diversity of species. The majority of hedgerows on site are being retained, aside from a section of defunct hedgerow along the eastern boundary for the proposed site access and frontage onto Roman Road. It is assessed that the loss of this section of defunct, species poor hedgerow will not have a significant impact on the ecological value of the site. Specific recommendations relating to the protection and enhancement of hedgerows during development are made in section 9.

The tall ruderal habitat will be lost through the proposed development. This habitat was assessed as having low botanical diversity, and is not afforded any special protection in terms of BAP/NERC habitats. Due to the low botanical diversity of this habitat, it has been assessed as having low conservation value. The loss of this relatively small area of common floral habitat will not have a significant negative impact on biodiversity at a local level.

Overall, the assessment has concluded that the proposed development plans would not have a negative impact on biodiversity at a local level. The retention and enhancement of the hedgerows on site and creation of an ecological/landscape buffer also provide opportunity for ecological enhancement.

7.2 Protected and Notable Species

Birds – There is suitable habitat for breeding birds within the hedgerows on site. The majority of hedgerows are being retained, aside from a small section of the defunct hedgerow along the eastern boundary. Therefore, mitigation is required to ensure that nesting birds are not disturbed during the clearance of the hedgerow.

Reptiles – The tall ruderal habitat has negligible potential to support reptiles. The hedgerows could provide potential for hibernating/sheltering reptiles, and these are being retained with a landscape buffer. The site is isolated from surrounding habitat by roads and therefore it is considered highly unlikely that reptiles are present on site and no further survey or mitigation is required.

Bats – It was assessed that no bats are roosting on site but that the hedgerows have the potential to be used by bats for foraging and/or commuting. Considering the location of the site, surrounded by roads and housing, bat species that are tolerant to light e.g. pipistrelle sp. are likely to utilise the site. As the majority of hedgerows on site are being retained with either a landscape buffer or gardens backing onto them, it is considered that bat activity surveys are not required as the site will remain suitable for foraging and/or commuting bats. Enhancements are recommended for bats in section 9.

Invertebrates – The habitats on site have low – moderate value for invertebrates. The majority of hedgerows on site are being retained and tall ruderal habitat will be lost as part of the development. Recommendations to mitigate for the loss of invertebrate habitat are made in the following section.

Badger – The habitats on site have low potential for badger, no evidence of badger was found on site and there are no further recommendations in relation to this species.

Amphibians/ Great crested newt – There are no ponds on site, and no ponds within 500metres that have connections to the site with suitable habitat because there are too many barriers (e.g. main roads and housing) to amphibians. The hedgerows on site have moderate potential for common amphibians, and the majority of this habitat is being retained. Part of the eastern hedgerow is being removed, and the recommendation in relation to hedgehog (pre-clearance check by a suitably qualified ecologist) will protect common amphibians. There are no further recommendations in relation to great crested newts.

Hazel dormice – The hedgerows on site are isolated from the surrounding hedgerow network and nearby woodland by busy roads. It is therefore assessed that it is highly unlikely that this species is present on site. No evidence of dormouse was found on site and there are no further recommendations for this species.

Hedgehog - No evidence of this species was found on site, however, hedgerows can provide suitable habitat for shelter and foraging. Hedgehogs are UK BAP species, and therefore, any opportunities to retain and enhance features for this species should be taken. The hedgerows are the key habitat feature for this species and they are being retained within the development proposals with the exception of a relatively small section along the eastern hedgerow.

8.0 CONCLUSIONS

8.1 Habitats

The habitats on site were assessed as being of low - moderate conservation value. The majority of hedgerows on site are being retained and the loss of a defunct section of hedgerow on the eastern boundary and relatively small area (approx. 1.39ha) of tall ruderal habitat to development is considered not to be significant, although opportunities for enhancing retained hedgerows and a landscape buffer alongside the hedgerow adjacent to the A12 are recommended.

8.2 Protected Species

The site has the potential to be used by breeding birds and foraging bats and therefore mitigation, compensation and enhancement measures for these species will be required as part of the development proposals. The assessment has also identified the potential for invertebrates, hedgehog and common toad and the incorporation of enhancement measures for these species are also recommended.

9.0 RECOMMENDATIONS

This section makes recommendations for mitigation, compensation and enhancement measures for ecology on the site. The key measures are detailed below:

9.1 Habitats

The development proposals would result in the loss of a relatively small section of defunct species-poor hedgerow. However, there is the opportunity to compensate for the loss of hedgerow habitat through replanting a native species rich hedgerow along the frontage of the development with Roman Road (with a gap for the access road and visibility splay if required). This has been included in the emerging development proposals for the site. Existing hedgerows should also be gapped up where required, with local provenance native species, to enhance the species diversity and structure of these hedgerows.

All hedgerows that are being retained should be protected by Heras fencing erected at least 1m from the hedge.

The loss of an area of tall ruderal habitat (approx. 1.39ha) of low botanical diversity is not considered to have a significant negative impact on biodiversity. Ecological enhancement will be achieved through the incorporation of a landscape buffer, which has the potential to provide habitat for a diversity of invertebrates (and other faunal species). It is therefore recommended that the landscape buffer is sown with a suitable wildflower mix (such as Emorsgate seed mix EM3) to increase botanical diversity and provide improved habitat for insects and other faunal species. This area should be managed by an annual hay cut in September, with the arisings removed in order to maintain floral diversity. Part of the landscape buffer (approx. 1/3) should also be left uncut each year to provide refuge for overwintering species.

The development proposals provide opportunity for habitat enhancement within the proposed area of open space through planting of species rich grass mixes, native shrubs and trees. There is also opportunity for habitat creation and planting within the gardens and the landscape within the built environment. Any planting should include native berry and nectar rich species where possible, as this provides the greatest enhancement for biodiversity.

9.2 Protected Species

9.2.1 Birds

The proposals include the retention of the hedgerows, with the exception of part of the defunct hedgerow along the eastern boundary. These activities have the potential to disturb nesting birds. In order to protect breeding birds on site, these areas must cleared outside of the bird nesting season (March to September inclusive) or else be subject to a pre-works check by an ecologist.

To compensate for the loss of the suitable nesting habitat, it is recommended that a native (local provenance) species-rich hedgerow is planted along the eastern boundary frontage with

Roman Road - with a gap for the access road and visibility splay. In addition to the new hedgerow as a biodiversity enhancement, 6 bird boxes (suitable for a variety of species) should be installed onto retained hedgerow trees within the site boundaries.

9.2.2 Bats

The development proposals include the retention of the majority of hedgerows on site, apart from a section of the defunct eastern hedgerow. These hedgerows have the potential to be used by commuting and foraging bat species that are tolerant of light, due to the fact that the site is surrounded by roads and housing, including the busy A12 and Roman Road. There will also be the loss of approximately 1.39ha of tall ruderal habitat, which could have potential for foraging bats. However, it is assessed that the loss of this relatively small area of foraging habitat will not have a significant negative impact on bat populations at a local level as the provision of a landscape buffer and gardens will continue to provide foraging habitat.

It will be important to ensure that there is no direct illumination of the hedgerows on site. The dwellings are set back from the retained hedgerows apart from at two points where the gable end of dwellings face the hedgerow, it is therefore assessed that lighting from the dwellings will not have a negative impact on bats using the hedgerows. If any lighting is to be installed along the access road, the following recommendations should be put in place to reduce light spill:

- Ensuring the use of controlled light distribution, optimised optics (flat glass - controlled light distribution below the horizontal), shielding accessories and careful luminaire positioning / minimal heights are employed in the scheme design;
- Adopting a light quality of colour rendering in excess of Ra60 allows a notable reduction in light levels due to increased visual acuity. The scheme design should consider the use of high colour rendering lamp sources (white light) to minimise design criteria, energy usage and reduce resultant impacts;
- Adopting a light quality that minimises disruption to existing ecological systems. Possibly in the form of 'sodium' or 'LED' light sources which emit minimal UV light.
- Adopting an appropriate control strategy for the operational lighting so that, when not required and subject to Health and Safety assessment, non-essential lighting is dimmed or switched off in order to further reduce the impact;
- Column and luminaires to be of a colour and finish to 'blend' in to the day time landscape view;

In addition to this, there is also an opportunity for a number of enhancement measures for bats, this could be achieved simply through including bat bricks within each of the new build houses, and/or erecting bat boxes within suitable hedgerow trees.

9.2.3 Other protected species

- The new area of grassland in the landscape buffer will benefit a range of invertebrate species. The recommended seed mix (Emorsgate Seeds EM3) contains four grassland species and 24 herb species and would increase the value of this boundary for a range of pollinators;

- Any excavations or trenches created during construction should either be covered at night time, or include ramps to allow animals to escape if they would fall in; and
- Any proposed fencing (including garden fencing) should include five inch square gaps or make use of permeable features that allow animals such as hedgehogs free movement around the site.
- The hedgerow removal along the eastern boundary should be undertaken in two phases in order to prevent the accidental injuring or killing of common amphibian species and hedgehog. First, the hedgerow should be cut to a height of approximately 30cm using hand machinery. This should be undertaken outside of the bird nesting season (March-September). Then, immediately prior to the removal of the hedge base, a check for hedgehogs and common amphibians should be undertaken by a suitably qualified ecologist. Removal of the hedge base should be undertaken between April-September inclusive (as this is during the period when amphibians and hedgehogs are active and will therefore avoid the risk of killing or injuring hibernating animals). If any hedgehogs or common amphibians are found, these should be carefully moved to an area of retained habitat on site.

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APPENDIX 1 LEGISLATION AND POLICY DETAILS

A1.1 Legislation - Species

This section outlines the key legislation related to the habitats and species considered within this survey report.

Bats

All British bats are protected under Section 9 Schedule 5 of the Wildlife and Countryside Act 1981 and amendments. In addition, they are protected under the Berne Convention, they are given migratory species protection within the Bonn Convention Agreement, and are protected under Schedule 2 of the EC Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (Habitats Directive).

Regulation 41 of The Conservation of Habitats and Species Regulation 2010 makes it an offence to deliberately capture or kill bats, to deliberately disturb a bat, damage or destroy a breeding site or resting site of any bat. It is an offence to disturb any bat roosting site. Presence of bats does not necessarily mean that development cannot go ahead, but that with suitable, approved mitigation, exemptions can be granted from the protection afforded to bats under regulation 41 by means of a licence. Natural England (NE) is the appropriate authority for determining licence applications for works associated with developments affecting bats, including demolition of their roost sites. In cases where licences are required, certain conditions have to be met to satisfy Natural England. Before the Statutory Nature Conservation Organisation (SNCO), in this case NE, can issue a licence to permit otherwise prohibited acts three tests have to be satisfied. These are:

1. Regulation 53(2)(e) states that licenses may be granted by SNCO to *'preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.*

2. Regulation 42(10)(a) states that a license may not be granted unless SNCO is satisfied *'that there is no satisfactory alternative'.*

3. Regulation 42(10)(b) states that a license cannot be issued unless SNCO is satisfied that the action proposed *'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'*.

In order to meet the tests, SNCO usually expects the planning position to be fully resolved as this is necessary to satisfy tests 1 and 2. Full planning permission, if applicable, will need to have been granted and any conditions relating to bats fully discharged. For test 3, the licensing body seek advice from Natural England. As well as consulting with Natural England, the licensing body may also seek information from the local authority before they will determine

any licence application. The licence application process may take two months before a licence is issued.

Reptiles

All reptile species in Great Britain receive some legal protection from legislation in the Wildlife and Countryside Act 1981. More recently, further protection was afforded in Great Britain to species listed in the Habitat Regulations 1994. Both the Wildlife and Countryside Act 1981 and Habitat Regulations 1994 provide mechanisms to protect species, their habitats and sites occupied by the species. Native reptile species fit into two bands of protection:

European protected species receive all elements of protection in Section 9 of the Wildlife and Countryside Act 1981 and the Habitat Regulations 1994. Native species that receive this protection are:

- Sand lizards (*Lacerta agilis*)
- Smooth snakes (*Coronella austriaca*)

This legislation prohibits the following on any of the above species:

- Deliberately or intentionally killing and capturing (taking) or intentional injuring.
- Deliberately disturbing
- Deliberately taking or destroying eggs
- Damaging or destroying a breeding site or resting place or intentionally damaging a place used for shelter or protection.
- Intentionally obstructing access to a place used for shelter; and keeping, transporting, selling or exchanging; offering for sale or advertising.

Species that receive protection against intentional killing, injuring and sale only:

- Slow-worm (*Anguis fragilis*)
- Common lizard (*Lacerta vivipara*)
- Adder (*Vipera berus*)
- Grass snake (*Natrix natrix*)

Both the Wildlife and Countryside Act 1981 and the Habitat Regulations 1994 apply to all life stages of the protected species: eggs and spawn, larvae, juveniles and adults are all protected.

Badgers

The Protection of Badgers Act 1992 is based primarily on the need to protect badgers from baiting and deliberate harm or injury. It also contains restrictions that apply more widely and it is important for developers to know how this may affect their work. All the following are criminal offences:

- to willfully kill, injure, take, possess or cruelly ill-treat a badger;
- to attempt to do so; or

- to intentionally or recklessly interfere with a sett.

Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett. It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed.

Development should not be permitted unless it is possible to take steps to ensure the survival of the badgers in their existing range and at the same population status, with provision of adequate alternative habitats if setts and foraging areas are destroyed. Natural England will normally only issue a licence after detailed planning permission has been granted, where applicable, so that there is no conflict with the planning process.

Before the planning application is determined, the local planning authority should request a detailed ecological survey/report and developers should be prepared to provide the following information:

- The numbers and status of badger setts and foraging areas that are affected by the proposal;
- the impact that the proposal is likely to have on badgers and what can be done by way of mitigation;
- judgment on whether the impact is necessary or acceptable; and
- a recommendation on whether a licence will be required.

Planning Permission and badger licensing are separate legal functions. Thus receiving planning permission from the Local Authority is no guarantee that development operations will not breach the Protection of Badgers Act 1992. Similarly planning permission does not guarantee that a badger licence will be granted.

Birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended) and cannot be killed or taken, their nests and eggs taken, damaged or destroyed, it also prohibits or controls certain methods of killing or taking except under licence. Other activities that are prohibited include possession and sale. Activities such as killing or taking birds (including relocating) which would otherwise be illegal can be carried out under licence where there is suitable justification and the issue cannot be resolved by alternative means.

Specially protected or Schedule 1 birds receive full protection under the Wildlife and Countryside Act 1981 (as amended). Part I birds are protected at all times, Part II during the close season only. In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

Hazel Dormouse

They are protected under both the Conservation of Habitats and Species Regulations 2010 and the Wildlife and Countryside Act 1981 (as amended). Dormice and their breeding sites and

resting places are fully protected. Without a licence it is an offence for anyone to deliberately disturb, capture, injure or kill them. It is also an offence to damage or destroy their breeding or resting places, to disturb or obstruct access to any place used by them for shelter. It is also an offence to possess, or sell a wild dormouse.

Great Crested Newts

Great crested newts are fully protected under UK and European legislation:

- Bern Convention 1979: Appendix III
- Wildlife & Countryside Act (as Amended) 1981: Schedule 5
- EC Habitats Directive 1992: Annex II and IV
- Conservation (Natural Habitats etc.) Regulations 1994: Schedule 2
- Countryside Rights of Way Act 2000 (CRoW 2000)

Because great crested newts are listed on Schedule 5 of the Wildlife & Countryside Act 1981, Section 9(1) of the Act makes it an offence to intentionally kill, injure or take great crested newts. Section 9(2) makes it an offence to possess or control a live or dead great crested newt or any part or thing derived from them. Section 9(4) makes it an offence to intentionally damage, destroy, obstruct access to, any structure or place which great crested newts use for shelter or protection. It is also an offence to intentionally disturb them while occupying a structure or place which it uses for that purpose. Section 9(5) makes it an offence to sell, offer or expose for sale, or possess or transport for the purpose of sale, any live or dead great crested newt or any part or thing derived from them. It is also an offence to publish or cause to be published any advertisement likely to be understood as conveying that great crested newts, or parts or derived things of them are bought, sold or are intended to be. Section 9 applies to all stages in their life cycle.

Their inclusion on Schedule 2 of the Conservation Regulations 1994 affords great crested newts extra protection by also making it an offence under Regulation 39(1) to deliberately capture, kill or disturb great crested newts or to deliberately take or destroy their eggs, or damage or destroy a breeding site or resting place. Regulation 39(2) makes it an offence to keep, or transport, or exchange great crested newts or any part or thing derived from them. Paragraphs 39(1) and 39(2) apply to all stages of their life cycle.

A1.2 Legislation - Habitats

Special Areas of Conservation

The legal requirements relating to the designation, protection and management of SACs in England are set out in the Conservation of Habitats and Species Regulations 2010 (SI No. 2010/490) (as amended), often referred to as 'the Habitats Regulations'. All terrestrial SACs in England are also Sites of Special Scientific Interest (SSSIs). The additional SAC designation is recognition that some or all of the wildlife habitats and species within a SSSI are particularly valued in a European context and require additional protection.

The Habitats Regulations require that any plans, projects or activities which are proposed and require a permission of some kind and may significantly affect a SAC must be subject to special

scrutiny and first require a detailed 'appropriate assessment'. The decision-making authority may only permit or undertake the proposals if the assessment concludes that there would no adverse effect on the integrity of the SAC. Where it cannot reach this conclusion, the project can then only proceed in particular circumstances. This process allows those proposals which clearly will not impact upon the special European wildlife interest of a SAC to proceed. Natural England is able to provide advice to authorities on how proposed activities can avoid adverse impacts on a SAC.

Under the Habitats Regulations planning authorities must also require that any permitted development normally carried out under a general planning permission but which may affect a SAC requires further approval before being undertaken.

As the statutory nature conservation body in England, Natural England is duty bound to ensure that SACs are protected and managed favourably for conservation in line with the requirements of the Habitats Directive. Our experience is that it is usually possible to find mutually acceptable solutions where sustainable land use and wildlife can flourish.

A1.3 Policy considerations

This section considers key policies that are relevant to ecology and development of the site.

National Planning Policy

NPPF policy 109: Conserving and enhancing the natural environment

The planning system should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, geological conservation interests and soils;*
- *recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

Local policy

The Brentwood Borough Council Local Plan (adopted August 2005) sets out a number of policies for conservation and the protection of the natural environment. The following highlights the key policy from this document and assesses the development proposals against it.

C1 – Sites of Special Scientific Interest

C3 - County Wildlife Sites, Local Nature Reserves and Other Habitats and Natural Features of Local Value

C5 – Retention and provision of landscaping and natural features in development

It was assessed that the proposed development would not have a negative impact on any statutory or local wildlife sites in the local area. The development is relatively small scale, impacting land of low conservation value. The majority of hedgerows on site, which have moderate conservation value, are being retained and new planting and biodiversity enhancements are being incorporated into the scheme. Overall, it is considered that the findings and recommendations in this report do not conflict with this policy.

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